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Researching the size and scope of online usage in the vocational education and training sector

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Australian *Flexible* Learning Framework
Supporting Flexible Learning Opportunities

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Background

In August 1999, the Australian National Training Authority chief executive officers endorsed the *Australian Flexible Learning Framework for the National Vocational Education and Training System 2000–2004*. The Australian Flexible Learning Framework has been developed by the Flexible Learning Advisory Group and represents a strategic plan for the five-year national project allocation for flexible learning. It is designed to support both accelerated take-up of flexible learning modes and to position Australian vocational education and training as a world leader in applying new technologies to vocational education products and services.

An initiative of the Australian Flexible Learning Framework for the National Vocational Education and Training System 2000–2004

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Executive summary

This project identifies, describes and analyses the size and extent of use of online learning in the vocational education and training (VET) sector in Australia, and highlights a range of features of online learning, and of the providers and users. The research described here contributes to the knowledge about online learning in the VET sector by looking beyond the specific contexts to identify the facilitators and inhibitors to successful experiences. This project was the first to collect national data relating to the size and scope of online usage in the VET sector and it was not able to deliver conclusive answers.

The methodology for this research was qualitative and quantitative. Meta-analytical methods were used to establish the broad parameters; quantitative methods were subsequently used to collect the core data. Case studies and semi-structured interviews were employed to validate and cross-check information and findings.

As a part of the literature review the historical and current interpretations of online learning and associated terms and definitions were examined. Importantly for this project, the terms 'online learning', 'online delivery' and 'virtual education' tend to be used interchangeably. 'Online delivery' refers to the technical focus but does not exclude individuals, teachers and learners who are an integral part of the delivery mechanism. 'Online learning', on the other hand, is more concerned about a learner-centred environment which is in turn facilitated by a range of technologies that permit online delivery. This distinction between delivery and learning reflects the complexity of the area under investigation.

Analysis of quantitative data demonstrates a varied understanding of a wide range of features of 'online'. The collection of these data also highlighted a need to identify and promote the use of consistent terminology in online learning. In addition, there is a significant difference in the scope of concept concerning what constitutes online methodologies.

Issues investigated in the literature review included the provision of support services and materials for institutes, teachers and learners. Online learning is heavily supported, in most states, through grant and project money and through a policy directive encouraging individual institutes to become involved.

If we look at the information gleaned from the interviews and case studies it would appear that the development of online materials is dependent upon a combination of availability of resources and staff skills. Furthermore, limited teaching or pedagogical models or structures within which to place online delivery, necessarily restrict development of integrated learning environments.

The case studies and semi-structured interviews provided the project with descriptive information on who is developing materials. There appear to be three groups: those embracing the online teaching–learning environment, those who are deeply engaged with the electronic learning environment and those who are simply tuned into the online world. The ultimate level of the online culture is what can be called the *virtual delivery culture*, a culture populated by those committed

to the development of online delivery, who see its structure and possibilities, and whose practice reflects 'best practice'.

Support appears to be lacking in curriculum development and course design skills upgrading. The provision of a common platform such as WebCT may make it easier to develop online courses but the skills needed for creating any form of online delivery are very different from those needed for good classroom delivery. Comments from the interviews suggested that those we dubbed online 'sophisticates' were sceptical about the possibility of the average staff member creating effective electronic media.

Results of the student outcomes surveys for 2000 and 2001 indicate little engagement by learners with the online option, in spite of the large number of modules identified by the state organisations as being offered online. Interviews with registered training organisations were designed to gather data to support the following research questions:

- How extensively is online being used as a stand-alone process?
- How extensively is online learning being used:
  - within particular states/territories?
  - according to provider type?
  - by particular program areas?
  - at particular levels of qualification?

The results of these interviews give the impression that registered training organisations across the country are offering and delivering online modules in a wide range of industry/occupational groupings. It is apparent that there is a need for greater conformity in the nomenclature and the identity of the courses offered in the different states.

Unfortunately, the states are not able to provide details on enrolment numbers within modules. As little information is available on the student enrolment, it is difficult to say which modules are most or least popular with students. Some idea may be derived from the number of modules offered in each of the industry groups.

Overall, the most popular industry groupings for online modules were property and business, communication, agriculture, forestry and fishing. The industry group of electricity, gas and water was the least covered and both mining and wholesale trade also had very few modules on offer.

The overall impression is that registered training organisations across the country are offering and delivering a wide range of online programs.

The reality to be faced in investigating online learning and student uptake is that the available statistics show very small numbers undertaking modules in an online mode. The National Centre for Vocational Education Research (NCVER) student outcomes survey data gave no indication that the students engaged in online activity were markedly different from the standard delivery student population. In looking at age groups for the 2001 data, the 20 to 24 year age group consists of over one-fifth of the online delivery for graduates (22%) followed by the 35 to 39 year age group (15%). For module completers, the 15 to 19 year and the 20 to 24 year age groups make up the largest portion.

The proportion of training received by online delivery methods among graduates in 2001 was around 60% for graduates in capital city areas and 40% for graduates in rural areas. For module completers the proportion was around 51% for both capital city and rural dwellers.

The current state of development of online delivery has not necessarily been driven by knowledge of the education market or by developments in educational models. Consequently, any suggestions about opportunities would need to be closely evaluated to determine if they were anything more than opinion. A real issue, which online deliverers need to address, is that of the quality of delivery and efficiency of delivery, since quality and efficiency are likely to attract students to courses.

Similarly, the size of the online education market is unknown because it cannot be said that all possible students want to undertake training online and not all of the desired subjects (an unknown proportion) are available online. This is clear from the data collected in this project. The provision of online courses in any given area could rapidly saturate that area of the marketplace. The need for education market research is obviously important.

Introduction

Project aim

The aim of this research is to examine online delivery in the Australian vocational education and training (VET) sector. The research has been undertaken by a consortium of organisations, comprising Chisholm Institute of TAFE in Victoria, West Coast College of TAFE in Western Australia and the Computing Education Research Group of Monash University in Victoria. (Full details of the consortium may be found in appendix 1.)

This project identifies, describes and analyses the size and extent of use of online learning, and refers to the program areas that have successfully adopted it. This study highlights a range of features of online learning, the providers and users, which were explored through four case studies. The research contributes to the knowledge about online learning in the VET sector by looking beyond the specific contexts to identify the facilitators and inhibitors to successful experiences.

A further aim of the project is the identification of the ways online delivery is used both as a stand-alone program or as part of a broader range of delivery approaches. The contexts and clientele for these approaches are also examined. In short, it aims to ascertain the size and scope of the online learning 'market' in VET in Australia.

Intended as a snapshot of the extent and usage of online learning in the VET sector, this report is written for policy-makers in the sector, as well as for decision-makers and teachers within training organisations who make decisions about the adoption of online delivery strategies in their program areas. The research described in this report has been underpinned by a number of research questions relating to online learning. These have been addressed using both qualitative and quantitative methodologies.

Key research areas addressed

The research focussed on the following four major areas:

- *Definitions of online learning:* What are the key features of online learning?
- *Students' experiences of online learning:* What are the characteristics of students enrolling in online learning? How are students supported in online learning? Are the various equity groups accommodated by online learning?
- *Providers' perspectives on online learning:* Who is offering and developing online learning? Public or private providers, work- and industry-based providers?
- *Online program offerings:* How extensively is online learning being used as a stand-alone process? Is it complemented by other approaches to learning? What industries are taking advantage of online learning?

Background and rationale

The use of online delivery has been increasing during the past several years as VET providers have sought to offer programs using a diverse range of technologies and pedagogies. To date, little work has been undertaken to identify the extent and usage of online as a delivery strategy in the VET sector. This project sets out to address this shortcoming.

Context of current research

The use of online technology as an educational tool is one of a number of technological changes impacting on all aspects of life and work, ranging from the computers which drive our washing machines through to the information revolution created by the internet. A key aspect of technological change is that it operates not only at a simple local level but is a part of the process of globalisation. Education and training are crucial components in the competition for global markets. Thus, it can be argued that knowledge has been transformed into an international currency which can be traded (ANTA 2000, p.8; Learning Technologies Branch 2000).

The project being reported here can be placed within a policy context where the need to know more about online education reflects both the broad positioning of the VET sector and the particular policies which drive the sector. Because the VET sector comprises a range of core delivery areas—TAFE, VET in schools, adult and community education (ACE), and private and industry-based providers—it plays a crucial role in the transition, in Australia, to an information economy.

Currently a number of national and state commissioned projects are researching issues related to online learning. There is, in addition, a reasonably large literature available which analyses both the rapid growth of online delivery and its effectiveness (Booker 2000; Brennan 2000a, 2000b; Harper et al. 2000; Smith & Smith 1999; Tapsell & Ryan 2000). However, it is evident from the literature search undertaken for this project that there is very limited information on the extent of online delivery in the VET sector in Australia, as noted in a recent research project:

> It is very hard to find any accurate data on the extent of online delivery of education and training in Australia and the data that is available is sometimes confusing and contradictory.
>
> (Brennan 2000a, p.19)

An impressionistic view gleaned from various studies suggests that the level of online delivery has grown rapidly over the last decade, but the actual extent is unknown. There is, therefore, a clear need to research the scope of online education within the sector.

The report, *Scope of flexible learning and implications for improved data collecting and reporting systems,* by Stewart-Rattray, Moran and Scheuler (2001) notes that:

> … there is an enormous amount of effort and creative ingenuity occurring within the flexible learning environment … this environment is still developmental and experimental and operates, in many instances, from the mainstream activities of the parent organisation.
>
> (Stewart-Rattray, Moran & Scheuler 2001, p.7)

As a result, claim these authors, very little formal information about online activity is available, including information about what managers want and should know about successful online delivery (Stewart-Rattray, Moran & Scheuler 2001, p.2).

Drawing on a review of Harper et al. (2000), Stewart-Rattray, Moran and Scheuler (2001) identify a number of key findings relating to online learning. These include:

- the existence of extensive exploration and experimentation with online learning in every state and territory, although it is yet to become a mainstream activity in VET
- an assertion that there is currently no accepted wisdom on the implementation of online learning

- an identification of a lack of well-defined policy regarding the implementation of online learning, although management systems are expected to improve
- a lack of knowledge of the needs of learners
- as a term, 'online learning' is applied to a wide range of electronic technologies.

Collecting data relating to online delivery

The Stewart-Rattray et al. report cited above also examines the data collection methods of state and territory authorities, highlighting the lack of distinction between online learning and distance education modes for the collection of data, with information relating to online delivery largely being manipulated to fit into existing reporting frameworks rather than being reported as discrete and clearly identified online activity. The report claims that only two states have attempted to define online delivery in a clear and concise manner. The most developed definition is that of Western Australia, with a range of options for online and remote access delivery type broken down into four further sub-categories: remote class, external, Channel 31 and internet site. South Australia is the other state, with a range of options for recording online delivery in an organised manner.

Although widely discussed, online learning is yet to feature in the eight VET delivery strategies under the Australian Vocational Education and Training Management Information Statistical Standard (AVETMISS) classification whose effectiveness were recently evaluated by Misko (2000a). These strategies, classified according to AVETMISS codes include: remote class; self-paced scheduled; self-paced unscheduled; external/correspondence; workplace/experiential; mixed delivery and other delivery strategies.

The National Centre for Vocational Education Research (NCVER) Statistics Division collects and publishes data from the student outcomes survey. The survey reports on students who undertook VET during the year at a technical and further education institute (TAFE) in Australia. Information is presented about two groups of students: graduates and module completers. Graduates are defined as students who completed their course during 2000 and graduated with a qualification. Module completers are students who successfully completed some training in 2000 and had left the TAFE system at the time of completing the survey.

The survey seeks information on a range of topics, including employment outcomes, further study plans (graduates only), satisfaction with the training, and respondents' general characteristics, such as age, gender, country of birth, and prior qualifications. In the 2001 student outcomes survey, two of the survey questions related to mode of training delivery, which included 'by correspondence' and 'online learning'. Respondents were asked to indicate all of the modes of delivery which had been part of their training (a multiple-response question) and also to indicate the mode of delivery by which the majority of their training had been delivered (a single-response question). It should be noted that in the questionnaire, the term 'online' was not further defined.

Only 0.5 % of the total graduates, from a sample of 39 426, used online learning in 2001 as compared to 0.8% in 2000 (total sample was 41 660). Only 1.7% of the module completers (total sample of 30 128) used online learning in 2001, not significantly different from 1.6% in 2000 (total sample of 7922). It is interesting to note that among graduates, both male and female students in the age group of 20–24 used a higher percentage of online learning (21.6%) in their training by comparison with students in all other age groups (0.4% to 15.3%).

Methodology

The methodology for this project utilised a mixture of quantitative and qualitative approaches. Qualitative and meta-analytical methods were used to establish the broad parameters; quantitative methods were subsequently used to collect the core data. Additional qualitative methods were employed in the next step of validating and cross-checking information and findings with in-depth qualitative data obtained through case studies. One of the underlying aims of the data-collection process was to determine the extent and methods of evaluation used in online curriculum implementation.

The methodology adopted reflects a consultative approach, whereby an associate team was used to provide access to, and input from, a large number of VET sector stakeholders and students. This approach was also supported by a website that was accessible to participants.

The research project was divided into four stages as described below.

Stage 1: Preparation

Stage 1 was designed to establish the working structure of the project and to collect basic data which would help to set the parameters, and included:

- review of the relevant literature
- analysis of current online activities using data available (for example, data from the student outcomes survey, and from states in which information on online learning activity is gathered)
- telephone interview with each of 85 surveyed institutes (see appendix 2 for questions)
- development of definitions of 'online' delivery (see appendix 3 for details)
- establishment of a website for feedback and discussion
- interviews with selected course developers in training organisations (n = 10), and contact personnel organisations/bodies identified as utilising online learning (n=20) (see appendix 4 for details of organisations and interviewees).

Stage 2: Data gathering

In stage 2, the findings from the literature, the online culture identified from within the VET sector and the requirements of the project, were used to determine the structure of a questionnaire which would elicit the necessary information to answer the research questions. The quantitative approach used in this phase follows conventional methodological processes, in that the questionnaire was piloted on a small sample of organisations in the VET sector before the full data-collection stage took place. With the large number of providers and possible courses/programs in the sector, the survey needed to be based upon a stratified random sample of all providers.

This stage involved gathering information about the extent of online usage in the VET sector and included:

- a paper-based survey to 85 TAFE institutes
- a paper-based survey to selected major private providers in all states.

A total of 551 surveys were distributed to institutes and addressed to human resource development managers, online learning managers or Learnscope managers and course deliverers. One hundred-and-thirty-seven replies were received. The survey is given in appendix 5. Thirty-five surveys were distributed to private providers and two replies were received.

Stage 3: Synthesis of data

A sub-sample of the survey responses (approximately 10%) from stage 2 was followed up to enable a more detailed exploration of their use of online approaches in delivery. This was done through semi-structured interviews (see appendix 6).

The aim in this stage of the project was to validate the quantitative data and the possible interpretations placed on the data examined so far. In this stage also, structural issues that could influence interpretation and modelling were cross-checked. Furthermore, this step enabled the team to investigate the relationship between program evaluation and program innovation in online delivery. This stage included:

- semi-structured interviews with a sample of all providers who responded to mailed/emailed survey
- further analysis of data gathered to date including any data gathered through the website
- contact with state authorities to collect data about the extent of online delivery at course/module level (appendix 7)
- identification of sites for case studies
- development of case study protocol.

Stage 4: Case studies and final report

Following analysis of the survey data, a case study methodology was implemented through the detailed exploration of four online activities selected by the following criteria:

- representation of innovative practice in online delivery
- accommodation of diversity of learner needs
- identification of people or processes displaying a quality or characteristic useful to the practice of other online practitioners.

The case studies have assisted the team to explore in more detail the rationale behind any particular model of online delivery, and assist in identifying good operating practices for dissemination within the VET sector. This stage included:

- conduct of case studies (n=3)
- synthesis of findings of case studies in accordance with defined criteria in submission
- completion of final draft report drawing together findings from the literature review, interviews, surveys and case studies.

Review of literature

The education system in Australia is undergoing constant change, reflecting a global trend. During the last decade, the most obvious development has been the substantial growth in the use of technology to produce and deliver educational programs. The traditional providers of education—TAFE, the adult and community education sector, universities and schools—have adopted and are using varying forms of online delivery in their programs. A search of the literature relating to the VET sector has revealed widespread interest in online learning.

Definitions

The project being reported here examines the scope and extent of online learning in the VET sector. The review of the relevant literature has been designed to inform an understanding of the current and future technological and pedagogical impacts of the use of online delivery. Within this context it has been important to identify adequate and acceptable definitions of the associated terminology. Online learning is a relatively new and continually evolving concept and there is confusion in the literature regarding the use of terminology. The terms 'online learning', 'online delivery' and 'virtual education' tend to be used interchangeably. The term 'virtual education' is taken to mean the study of credit and non-credit courses from worldwide remote sites that are neither bound by time or physical location (see http://illinois.online.uillinois.edu/online/course1/reid.htm). The Victorian TAFE Virtual Campus is one example of a provider of virtual education. 'Flexible delivery' and 'distance education' on the other hand, often appear to be used in contexts which assume online education. In this review, we report on the various definitions available in the literature in an attempt to understand the range of interpretations of the terms, and the various ways this mode of learning and delivery is described.

It is important to note that a multitude of definitions and interpretations have been proposed for the term 'online learning'. The research, including interviews with stakeholders, undertaken for this project highlighted the variety and diversity of definitions and understandings of online learning. (These are given in detail in appendix 3.)

The concept of pedagogy

This literature review is undertaken within an educational context. Therefore, our first step is a clarification of the term 'pedagogy'. Defined by Boettcher and Conrad (1999) as the 'art or science of teaching', the notion of pedagogy builds on the core components of the learner, the teacher, a task that the learner undertakes with the support of the teacher, and the knowledge required by the learner to complete the task (Boettcher & Conrad 1999, p.16).

This interpretation draws on the philosophy of Dewey (1859–1952) that places the learner at the centre of the educational experience, engaging in learning activities that are supported by teachers and others whose role it is to guide the learner towards the achievement of understanding and skills

development. A feature of this constructivist approach is the creation of a learning environment which enables the learner to construct their learning opportunities in order to achieve their desired outcomes in ways that best suit them (Bruner 1996). This is the central theme of current educational directions of learner-centered learning, self-directed learning and flexible learning.

Technology as the medium

In searching for a definition of technology, Boettcher and Conrad propose that 'the technology of education is the body of materials and methods used to extend or enhance the ability to learn, collect data, solve problems, and promote communication between and among faculty and students' (1999, p.7). Boettcher and Conrad also claim that the difference today is not that we use technology in education, but merely that it is the type of technology that is different. Where once we used television and VCRs, we now also use technologies such as the internet. Today, the difference is in the kinds of technology used to facilitate the learning process.

As early as 1994, Burnett described educational technology as taking 'many forms, from pre-packaged games to word processing and graphics packages, complex multimedia systems and telecommunications networks such as the internet'. In proposing the use of these media in the classroom, or in geographically dislocated, networked arrangements, Burnett (1994) cautions that educators must clarify the role of computers as a pedagogical tool, define the relationship of computers to existing curricula, and establish the level of human and financial investment they are willing to make in the medium.

Online technologies have the potential to improve a person's access to learning programs as well as the communications between learners and teachers. The main benefit of online technologies is given as being the ability to connect people to other learners, to their teachers, to learning resources and to the wealth of information available through the internet and the world wide web (www).

However, the claims of increased access, equity and cost–benefit which regularly accompany the promotion of educational technology are not without their critics. Oliver (1998) maintains that the assumed goals of the new technologies, such as 'economies in costs, greater levels of access to students, more flexible teaching and learning approaches and enhanced educational opportunities' are not being achieved in reality. Most significant, he claims, is 'the frequent failure of online learning environments to create enhanced learning processes and outcomes' (p.240). He believes that one of the most common failings is in the design of the online environment, maintaining that they seem 'frequently to fail to take advantage of the learning opportunities which the new technologies offer and support' (p.241).

Like Boettcher and Conrad (1999), Oliver firmly believes that 'technology based approaches to learning provide many opportunities for constructivist learning through their provision and support for resource-based, student-centered settings and by enabling learning to be related to context and practice' (p.242).

The online environment, including web-based technology, requires those involved in teaching and learning—teachers, instructional designers, and administrators to develop more 'explicit knowledge about designing effective educational experiences' (Boettcher & Conrad 1999, p.15). In this way, it will be possible to take a sound pedagogical stance on online learning because the emphasis will be on the 'unique and individualized nature of the interaction in the learning experience' (p.21). This means that active participation on the part of the learner will be supported by the role of the instructor as facilitator.

Components of online education

To develop a clear picture of the extent of online education it is important to have a knowledge and understanding of the terminology used by individuals and groups in this context. This includes those two terms generally used in this context—'online delivery' and 'online learning'.

Distinguishing these two terms is critical to this project to enable a careful analysis of responses relating to the research areas on the basis of interest, motivation and uptake of online activities by a wide range of stakeholders in VET.

Online delivery

Online delivery is defined as the use of computers connected *to a network* to provide access to learning programs, to provide information flow between individuals and to allow for communications between individuals and groups of learners in a training program. Brennan (2000a) has adopted the online delivery definition of University of Illinois (1999) which identifies three broad categories of *online delivery* where:

- Computers support teaching and learning.
- There is a mixture of computer support and online delivery.
- Computer technology alone delivers education and training.

This definition used by Brennan emphasises *online delivery* as a computer technology which enhances, extends and can replace traditional teaching and training practices. A more recent definition from Harper et al. (2000) provides useful direction in the search for a clear definition of 'online delivery':

> On-line delivery in the education context is widely used to refer to all aspects of on-line activity, including the design, development and implementation of Web materials as well as the teaching and learning activities. (Harper et al. 2000, p.7)

This definition does not limit the use of the term to 'technical' aspects of provision alone, and includes reference to the individuals (teachers and learners), the organisation, and educational processes as integral to the delivery. In many cases the use of online delivery strategies requires the learner to be an active participant in the learning process, making choices of what to do, when to do it and how to access the required learning resources. This is a slightly different approach from that proposed by Booker (2000) who describes online delivery as essentially a communication technology to enhance the delivery of courses, to improve students' access to learning opportunities and to improve their success. It is, proposes Booker, a tool that provides enterprises and individuals with access to just-in-time training from wherever they are located.

It is important to understand that online delivery does not include only those courses that are offered entirely online and off campus. The current trend in the VET sector is to use online to enhance traditional on-campus teaching and print-based distance education. Online delivery is therefore often used as an adjunct to the other modes of delivery. For example:

- Combined with face-to-face delivery: Warner, Gayre and Chou (1998) found that 86% of students surveyed preferred face-to-face learning to teleconferencing or videoconferencing. This study indicated that students preferred other modes of learning in combination with face-to-face delivery.
- Combined with distance delivery: Distance education in Australia generally refers to the delivery of courses based on the use of self-contained and self-instructional learning packages (Inglis 1999). One argument put by the online education proponents is that online delivery complements the traditional forms of education by providing ready access to greater source of information.

Online learning

While 'online delivery' is clearly defined and explained in the literature, the definition of 'online learning' is characterised by cross-references to online education, online delivery and online technologies. Drawing on a range of discussions about the definition of 'online learning' in the Illinois On-line Network, online learning can be viewed as being facilitated through courses, programs and activities which are highly interactive and engaging, and are delivered via the internet

at any time, any place, any pace. The minimum requirements are cited as a computer, access to the internet and motivation:

> Online learning is essentially a computer-mediated mode of learning that implies a person or persons' connection to a network to enable synchronous or asynchronous interaction with people and materials. It accommodates stand alone material such as CD-ROMs, printed matter and individual and group face-to-face engagement as part of the holistic approach to learning and assessment. (Illinois On-Line Network)

This definition however, demonstrates the shift in the interpretation of online learning away from pedagogical issues and towards technological issues. Fox (1999) explains that in the online environment there is too close a link between the 'viewpoint of learning and the viewpoint of economics'. He believes that when learning becomes a commodity that can be technologically produced and sold, then the learner becomes a customer. This creates a risk of a shift in the balance of emphasis away from the learning and the delivery processes towards the commodification of learning. In reality, this leads to the use through much of the literature of the phrase 'delivery of online learning'.

There seems to be some disagreement as to the relationship between online learning and distance learning. The idea that online learning is a totally new technology of learning and one that is totally different from distance education is hotly debated. There has been some use of electronic media in distance education. Inglis (1999, p.222) states that distance educators have used email extensively to provide assignments and feedback and to respond to students' queries. Similarly, file transfer protocol (FTP) has been used to enable students to download software and documents. Multimedia CD-ROMs have been specifically designed for open and distance learning, and there is a growing trend for distance educators to use telecommunications to enhance the communication between the students and the teachers (and/or fellow students).

Towards a new definition of 'online learning'

The literature review clearly illustrates the definitional difficulties in dealing with online education. We have presented views ranging from educational innovation through to those concerned with technological consequences. The implications therefore of these distinctions in the language of online learning are important to the aim of this project in the construction of more inclusive definitions of online learning. At this stage it would appear that most people involved with *online delivery* consider that an essential prerequisite for this is connection via inter/intranet, and those engaged in supporting *online learning* prefer to strongly encourage the application of good pedagogical practice.

The literature review has shown that, as within most educational issues, the analysis of online education does not lead to simple and easy conclusions. At this stage, based on the literature reviewed, and from discussions with stakeholders interviewed for the project, the project team proposes the following definitions as they relate to online delivery and online learning.

Online delivery

Online delivery is the use of computers connected to the internet to provide access to educational programs and activities, enabling communication between learners and teachers using asynchronous platforms such as email, web-based text and graphics, bulletin boards and a list server or discussion groups, and synchronous activities such as live chat and video conferencing. At all times the medium should enable the learner to be an active participant in the learning process, making choices of what to do, when to do it and how to access the required learning resources.

Online learning

Online learning is the result of teaching and learning strategies that are developed to enable a learner to effectively use online resources to develop skills, understanding and knowledge associated with the 'learning outcomes' of a curriculum or competencies of a training package. Online learning will benefit from online delivery mechanisms established to support learning mechanisms, such as mentoring, peer collaboration and communications. Online learning is '… an educational philosophy for designing interactive, responsive, and valid formation and learning opportunities to be delivered to learners at a time, place, and in appropriate forms convenient to the learner' (Boettcher n.d.).

The distinctions which have been identified between delivery and learning reflect the complexity of the area under investigation, and obviously the two definitions given above are interrelated. For the purpose of this research, these two definitions, taken together, form a basis from which to develop the project.

Forms of online learning

Forms of online learning are described in several ways in the literature. Brennan (2000a) for example, focusses on the type of organisation offering the online education and divides online learning itself into formal and informal programs.

Formal programs of online learning are delivered by the traditional providers of education and training, institutes and colleges of TAFE, private providers, the adult and community education sector, universities and schools. These institutions provide varying degrees of online support and direct delivery to learners within their courses. Some deliver whole courses online. Broadly speaking three modes of online learning are currently in use (Beckett 1998):

- as an enhancement to the traditional mode of delivery where classes are held on campus, with interaction with fellow students and the teacher
- as stand-alone online delivery on campus with a classroom facilitator, often with a flexible delivery approach
- using only online material off campus with or without a flexible delivery approach.

Jasinski (1998) notes that deliverers of online learning, and learners engaging in online learning activity, use a range of technological applications within two main platforms when they engage in online learning. Within the internet/intranet platform they will use one or more applications such as web pages, email, hyperlinks, search engines and list servers, while the alternative platform is the CD-ROM which can have an inbuilt, albeit static, browsing capability.

The lack of clear pedagogical goals in the online learning field appears to have left many systems with online content that is merely an electronic version of print-based courses (Chalmers & Murray 2000). Kiser (1999) maintains that transformation to an online mode of delivery is not simply about transferring the written material on to the website. More is required than simply editing the present classroom material for use in an online program.

Private providers offer online learning courses focussing mainly on the information technology training for which consumer demand is highest and courseware is plentiful (Barron 1999). Some of these offerings are accredited and certificates are awarded to the participants. Commercial vendors offer web-delivered courseware with bulletin boards, chat features and instructor support (Bennett, Priest & Macpherson 1999).

Because of the ease with which the training material can be distributed to the remote learners by the online medium, multinational organisations offer global online training to workers. The term 'e-learning' has been introduced in the training market and is used variously to describe the facilitation of the delivery and assessment of learning via a web browser-based internet and intranet

system. However, Stoll (2001, p.3) cautions that online education is 'seen as a way of making money and saving on teaching costs'.

The literature provides many instances of support for the uptake of the technology that will enable organisations to take the learning to the learner more readily. Key features of online courses include the ability to convert existing print materials into HTML text and graphics (Booker 2000; Cann 1999; Kiser 1999; Smith & Smith 1999). Placed on a server, either as an internet or intranet site, discussion groups are set up for interaction between students and lecturers as well as for assessment processes. Other key features include the capability to deliver course content directly to students, and provide access to course material to learners anywhere at anytime.

Research into online learning in Australia

As noted earlier, while a number of national and state commissioned projects are currently researching issues related to online learning there is, in addition, a reasonably large literature available on the analysis of the rapid growth of online delivery and its effectiveness (Booker 2000; Brennan 2000a; Harper et al. 2000; Smith & Smith 1999; Tapsell & Ryan 2000). However, it is evident from the literature that there is very limited information on the extent of online delivery in VET sector in Australia.

National and state research into issues relating to online learning include an examination of its cost-effectiveness (Curtain 2002), learner expectations and experiences (Choy, McNickle & Clayton 2002), and views on quality (Cashion & Palmieri 2000), as well as underpinning pedagogical processes. Other projects sponsored by the Learning Technologies Branch (Victoria) are exploring the social impact of online learning. It is vital that the nature and level of current usage is identified to inform ongoing research projects.

Important to this research are the findings of the Australian Student Traineeship Foundation's Victorian Vocational Education Coordinators Online (VECO) evaluation projects, 1998, which provide a window into online learning in schools, and the 1999 review of the state of Australian online education and training practices (Harper 2000). McKavanagh et al. in their report, *Evaluation of web-based flexible learning in the vocational education and training sector* (1999a, 1999b) provide some details of enrolments in online and web-based learning in Australia. In addition, research findings into the effectiveness of new technology in VET (Misko 2000c), and learners' dispositional and skill readiness for online delivery (Warner, Gayre & Choy 1998), are consistent with unpublished research based on a preliminary scan of national industry training advisory bodies (ITABs), in which few of the 23 ITAB organisations were able to identify engagement with online learning.

An overview of the use of online services by students in schools, VET and universities (White 1999) gives a quantitative snapshot of the level of education online usage and access. Together with information from the Learnscope and Framing the Future databases, the results from this current research form the basis for future comparative analyses. Furthermore, this current project addresses criticisms of the area for its lack of consistency in the use of terminology and in defining technologies, such as that from Tapsall and Ryan (2000, p.148). They maintain that this lack of consistency results in a confusion in the use of the terms 'virtual' and 'online' where they are being used interchangeably to describe different approaches to technology integration. This project seeks to resolve this problem by attempting to clarify more inclusive and realistic definitions of online learning in the VET sector.

Motivation for online delivery

Chalmers and Murray (2000) quote Westera (1999) who describes three factors responsible for driving the innovation that is 'online':

- ✧ the convergence of classroom teaching and open learning
- ✧ the push for technology-enhanced collaborative learning

- ✧ the changing relationship between student and teacher in the quest of lifelong learning.

According to Borthwick (2000), Australia has 1.65 million students in vocational education and training. Furthermore, one in eight Australians of working age participates in vocational education. Online delivery, she maintains, will allow more and more people to undertake training, who may have earlier been excluded because of distance, home responsibilities and the demands of work.

Others see the push for online delivery as driven by factors other than the needs of the students. The findings of Stewart-Rattray, Moran and Scheuler (2001) interpret the work of Harper et al. (2000) and make the following caution:

> [on-line delivery] is surrounded by rhetoric and policy that far exceeds implementation, suffers from a lack of clear definition at all levels and is supply rather than demand driven. Further, it suffers from major barriers in industrial relations issues with regard to teaching awards and conditions that cover teaching and technical support staff, achieving limited success despite the systems in which it operates rather than as a result of the systems. It seems that it is mostly championed at the operational level by teachers and with little or no understanding and support of senior management at the institute and State and Territory level. (Stewart-Rattray, Moran & Scheuler 2001)

Online learning in the higher education sector

An examination of the literature relating to the evaluation of online learning in the higher education sector is important to this study as it has obvious parallels with the VET sector. The main issues to emerge from the literature relating to the higher education sector are identified below.

Growth in online delivery

The higher education sector in Australia, as in the VET sector, has seen a rapid growth of online delivery of education programs during the last decade. From its beginning in the early 1990s, online learning has developed from simple use of communication technologies to fully stand-alone online programs (Jones 1999). However, within the higher education sector, there are particular factors which have provided the impetus for the development of online programs. Reduction of government funding has driven universities to look for technological solutions to meet operational costs and maintain programs with fewer available resources (Oliver 1998). Added to this, the desire to be competitive in a global marketplace has encouraged universities to implement strategies for the provision of educational programs to a distributed and diverse client base (Adam & Wilson 1997). McDonald and Postle (1999), propose that the growth of online development is also a consequence of political and social pressure to increase the access of educational programs to a diverse student population.

Changing learner environments

In parallel with the adoption of online delivery of educational programs, the higher education sector has seen a shift in the pedagogy underlying the design of these programs, with a move from traditional teacher-centered to student-centered learning environments (Oliver 1998). Some have termed this change a paradigm shift (McDonald & Postle 1999). The early online courses did little more than use the electronic media to transmit information, mirroring the content of paper-based, traditionally delivered educational programs. In 1996 Hall asserted that most universities were using technology 'simply to complement their conventional teaching'. However, advances in communication technology during the last decade, in particular the world wide web, have enabled the creation of course materials that provide the learner with facilities to interact with online information. This has encouraged the development of student-centered learning environments (Brown & Thompson 1997).

Widespread use of electronic learning

Research into online learning in the higher education sector has shown that a variety of approaches for course delivery are currently employed. Online materials are used to enhance traditional classroom delivery—in stand-alone mode with varying degrees of facilitation from a teacher, or in distance education mode. In addition to this, many universities have adopted flexible delivery as a key initiative for catering to a wider variety of students (McDonald & Postle 1999). An indication of the extent of the use of online delivery was shown in a study of the educational use of the web in the Faculty of Information Technology of Monash University in 1999. This revealed that most lecturers provide some form of electronic learning environment for their students, ranging from static pages with basic functional resources to totally integrated interactive learning environments (Sheard, Postema & Markham 2001).

Role of teachers in promoting online learning

Much of the online development and delivery in the higher education sector has been driven by individual teachers who are interested in this mode of delivery (Gilbert 1996). However, other teachers have been encouraged or directed to become involved in online delivery as a result of policy within their institution. Many university teachers incorporate online material into their courses to provide facilities for flexible delivery or allow part-time or distance education students access to courses. Furthermore, some teachers have become involved in online delivery because they believe it enhances the quality of education to their students (Lambert & Williams 1999).

Impact on teachers' workloads

The design and development of online learning environments have significantly impacted on teaching staff work practices and workloads in the higher education sector. A survey of staff in the Faculty of Information Technology of Monash University in 1999 revealed that many teachers were spending considerable time each semester on the development and maintenance of online resources for their students, often providing these resources in addition to the traditional paper-based resources. The need to assist and guide academics in the use of online media has been recognised by some universities. At Queensland University of Technology a collaborative group called Webworkers was established to provide support for staff using online technology (Gilbert 1996).

Technology versus pedagogy

With the trend towards online delivery in the higher education sector, concerns have been expressed about the danger of too much emphasis being placed on the technology to the detriment of pedagogical issues and the needs of the learners (Ingram & Northcote 2000). Vargo (1997) contends that there is much experimentation with the use of web technology in delivering educational programs; however, there is very little work being done to date on the effectiveness of this media. The necessity of a sound pedagogy for the design and use of online materials has also been emphasised by others (Stoney & Wild 1998; Weston et al. 1999). A search of the literature has failed to reveal any major studies in the higher education sector in Australia which have investigated these issues. There have, however, been various minor institution-based studies. A case study of an online economics class at Murdoch University highlighted the importance of considering pedagogy in the instructional design of online materials (Brown & Thompson 1997). A larger-scale joint project, a collaboration between Edith Cowan University and the University of Wollongong, proposes to identify and develop generic online resources that will be selected and evaluated based on their pedagogical effectiveness. These resources will be published and made freely available with support materials to guide their use. The ultimate aim of the project is to encourage the use of pedagogically based technologies (Oliver & Harper 2000).

Student support

Other studies have looked at learning issues. Since 1996, Charles Sturt University has been developing a strategy for online support of subjects, with the aim of increasing student access to information resources that can be used to enhance student learning. Students reported that access was the main determinant affecting their use of online subjects (Williams, Lord & McFadden 1997). A study at Murdoch University investigated barriers students may face when studying online (Lund & Volet 1998). Another study at Monash University in 1999 investigated how valuable students believed that online resources were for their learning (Sheard, Postema & Markham 2000). These studies and others have helped to build a picture of student reactions to online learning in the higher education sector. This picture is one which shows the students using online materials as a replacement for paper materials rather than as a new learning medium. For example, online materials are likely to be printed from the screen for use rather than being used on screen, a practice which demonstrates that students perceive online resources as convenient. The research did not produce data that showed they differentiate between the two at a learner level.

Further issues

A number of issues are identified in the literature in relation to the processes and support required for online delivery and learning. These include staff development, pedagogical issues, access, equity, and cost-effectiveness. These issues are argued at length in a number of papers and reports including those of Gosper et al. (1996) and Wheeler (1996). Gosper et al. (1996) studied the barriers to the implementation of online technologies into teaching. In relation to staff development they suggest that:

> Current approaches to staff development which offer short term exposure to specific case examples will not develop the required critical mass of expertise to allow technological approaches to become mainstream. (Gosper et al. 1996, p. 6)

To overcome this challenge they suggest a need for a greater commitment of time and resources than currently available. This will necessitate integrating strategic planning in the area of information technology into organisational management plans. Wheeler (1996) raises pedagogical issues, including those relating to the changing role of trainers/teachers from face-to-face contact to that of facilitator, net expert, information manager and a team member.

Student and staff support in the form of help desks, with information about hardware, software, login, password, email have been suggested as essential components of online usage (Smith & Smith 1999). The Online Student Services Project conducted under the auspices of the National Collaborative Framework for Flexible Learning in Vocational Education and Training 2000–2004 (ANTA 2000) found a wide range of strategies for student support services being utilised in the VET sector institutes. Some were identified as focussing largely on the teaching and learning aspects, while others were providing a more holistic approach to support services. The study also found that the prospective learner in a number of institutions has access to less information and assistance than students in other stages of the learning cycle. This is especially true in the areas of career advice and course advice, with access to career advisors being problematic. The study recommended the provision of mechanisms to support attempts to develop and implement online delivery and to work collaboratively to support learners in this new, challenging and stimulating environment.

The Australian National Training Authority's Toolbox Central website (www.anta.gov.au/toolbox) has a range of resources identified for course developers and facilitators, managers and those involved in learner induction and support. In 2001, Learnscope, an Australian National Training Authority-funded national professional development project, was hosting 65 work-based learning projects and supporting 30 projects throughout Australia (see www.learnscope.anta.gov.au).

The studies on pedagogy conducted by Jasinski (1998) and the University of Illinois (1999), examine the multidimensional nature of pedagogy, and what constitutes good teaching and training practice. These studies are complemented by work on new pedagogical approaches, especially in relation to assessment, group interaction and the student–teacher dialogue (Ellis & Phelps 2000; Vrasidas & McIsaac 2000; Houlden et al. 2000; Foley & Schuck 1998).

Online learning does present an important opportunity for the delivery of VET in regional areas of Australia and for disadvantaged groups, including women and single parents. The issues of equity of access, including the cultural needs of students who are Indigenous Australians or Torres Strait Islanders, present a challenge to make this method of VET flexible learning accessible and effective. For example, with particular regard to Indigenous students in rural areas, McLoughlin and Oliver (2000) suggest several strategies that could enhance online learning, including a focus on the local culture and community.

Computer literacy is an issue which impacts on both access and online pedagogy, particularly for mature-age learners, of whom there are relatively high proportions undertaking vocational education and training in rural areas. Qayyum and Ruhe (2000) found that participation in learning courses tended to lead to satisfactory acquisition of competence with the learning technologies applied. However, their survey data are derived from students who had successfully completed the course on which they were being surveyed. It is possible that those who were unable to acquire a minimum level of computing skills are not represented in Qayyum and Ruhe's research.

The learner perspective on flexible learning has been studied by Misko (2000b), who found that students' major concern with flexible delivery was the lack of interaction with others, including fellow students and teachers. This is at odds with the findings of McKavanagh et al. (1999b), who maintain that online engagement supports the concept of lifelong learning. It was found however, that students need information on how to interact online and also an induction exercise before they select a particular mode of delivery (Govan & Clulow 2000). Warner, Gayre and Choy (1998) in their report showed that more than 70% of Australian VET learners had neither the disposition nor the skills for flexible delivery. Kirkwood (2000) highlights the need to understand the relationship between learners and technologies and between the learning and social and domestic settings, noting that:

> Access to information technology is far from ubiquitous, even in affluent developed countries. Issues of cost and access in information technologies must influence the design and implementation of online courses if such courses are to extend the educational environment.
>
> (Kirkwood 2000)

An important issue raised in the literature is that rarely is the cost of developing the online programs fully understood before embarking on a project (Harper et al. 2000). Online delivery is not always cost-effective, with online delivery program costs reported to be double the cost of running a face-to-face program (Webb 2000). The costing depends mainly on project management, design, production and delivery issues (Vidler 2000) and while partnership with core content providers who are responsible for maintenance will be a cost-saving strategy (Haley 1999), the shift to online delivery on a cost-saving basis alone may not be justifiable in an Australian context at the moment (Inglis 1999).

That the uptake of online technology as an educational medium must be made in a multidimensional approach is a critical point made by Kiser (1999). There is no single strategy that will ensure the best outcomes for the students (Misko 2000a). In her identification of eight main factors that help us understand the way in which information is learned, Misko (2000b) also highlights the complexity of the issues. These include a suitable environment, readiness to learn, the ability to analyse, interpret and manipulate information, attention, feedback, repeated and varied practice, prompting and storing the information.

Students who study online

The following data are derived from the results of the 2000 and 2001 student outcomes surveys collated by the National Centre for Vocational Education Research, a national survey of TAFE graduates and module completers who completed their training from a TAFE institute. Graduates are defined as students who completed their course and graduated with a qualification. Module completers are students who successfully completed some training and had left the TAFE system at the time of completing the survey.

The survey sought information on a range of topics, including employment outcomes, further study plans (graduates only), satisfaction with the training, and respondents' general characteristics, such as age, sex, country of birth, and prior qualifications. Two of the survey questions related to mode of training delivery, which included 'by correspondence' and 'online learning'. Respondents were asked to indicate all of the modes of delivery which had been part of their training (a multiple-response question) and also to indicate the mode of delivery by which the majority of their training had been delivered (a single-response question). It should be noted that in the questionnaire, the term 'online' was not further defined.

It should also be noted that the majority of the tables which follow compare the responses to online learning with the responses to all other modes of delivery, as indicated in the multiple-response question.

The data compare the results of the 2000 survey and the 2001 survey. In 2001 the sample consisted of 39 426 graduates. In 2000 the sample was 41 660. The module completion survey consisted of 30 128 graduates in 2001 and 7922 graduates in 2000.

Table 1 gives a comparison of how the graduates and module completers received their training. As can be seen, over half of the graduates experienced the traditional classroom mode of delivery in both years under study. The figure is higher for module completers. In contrast, the proportion of graduates who received their training via online delivery is around 2% and the same for module completers. Table 2 shows in greater detail how the two groups received the majority of their training with a further breakdown of the data and relates to the majority of the training delivery. As can be seen, the proportion of graduates studying online drops to less than 1%. The module completers studying online drop less dramatically. This may indicate that module completers are more likely to enrol in online subjects.

Table 1: Training delivery—graduates and module completers, by percentage

Training delivery—multiple response	Graduates (%)		Module completers (%)	
	2000	2001	2000	2001
In a classroom (with no work placement)	52.6	55.2	61.2	61.1
In a classroom (with work placement)	39.4	37.6	25.5	24.4
In your workplace	12.1	12.0	7.7	8.0
Group or individual project work	25.1	22.5	17.1	16.5
By correspondence	6.1	6.6	5.9	5.4
Online learning	2.1	2.0	2.2	2.3
Other	4.0	3.4	3.2	4.1
Not stated	4.4	1.0	4.3	4.4

Table 2: Training delivery (majority), by percentage

Training delivery—multiple response	Graduates (%)		Module completers (%)	
	2000	2001	2000	2001
In a classroom (with no work placement)	40.3	40.4	43.8	40.5
In a classroom (with work placement)	28.4	24.8	20.3	19.2
In your workplace	6.6	7.9	7.6	8.6
Group or individual project work	13.1	13.0	15.8	15.6
By correspondence	4.0	4.4	4.0	3.9
Online learning	0.8	0.5	1.6	1.7
Other	6.8	9.0	6.8	10.5
Total	**100.0**	**100.0**	**100.0**	**100.0**

In looking at age groups for the 2001 data (table 3), the 20 to 24 year age group makes up over one-fifth of the online delivery for graduates (22%), followed by the 35 to 39 year age group (15%). For module completers, the 15 to 19 year and the 20 to 24 year age group make up the largest proportion.

Table 3: Age at 25 May 2001 (summary), by percentage

	Graduates			Module completers		
	Male %	Female %	**Total**	Male %	Female %	**Total**
15–19	14.4	11.1	**12.6**	17.3	11.6	**14.6**
20–24	25.5	18.6	**21.6**	16.1	11.7	**14.0**
25–29	6.4	9.4	**8.1**	8.8	8.9	**8.8**
30–34	10.8	13.1	**12.1**	9.4	10.4	**9.9**
35–39	13.7	16.5	**15.3**	10.2	12.9	**11.5**
40–44	12.5	12.6	**12.6**	11.4	14.1	**12.7**
45–49	8.7	9.4	**9.1**	9.0	11.7	**10.3**
50–54	4.3	5.5	**5.0**	7.8	8.7	**8.2**
55–59	1.2	2.4	**1.9**	4.7	5.1	**4.9**
60–64	2.3	0.7	**1.4**	2.8	2.6	**2.7**
65+	0.1	0.7	**0.4**	2.4	2.4	**2.4**
Group total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table 4 demonstrates that, in 2001, for graduates, the break-up in delivery modes—between online and other methods—in capital cities is similar to that of rural areas, at around 60% in favour of capital city areas and 40% in rural areas. Module completers are around 52% to 48% in favour of capital city areas.

Table 4: Metropolitan vs. rural participation, by percentage, 2001

	Graduates		Module completers	
	Delivery methods			
	Online	*Other*	*Online*	*Other*
Capital city	60.8	61.1	52.2	50.9
Rural areas	39.2	38.9	47.8	49.1
	100.0	**100.0**	**100.0**	**100.0**

Table 5 shows that the qualification received from training for graduates involved in online delivery in 2001 is at certificate II level (32%) followed by certificate III (28%) and diploma (16%). By comparison, graduates using other methods of delivery received a certificate III (30%) and certificate II (27%) followed by certificate IV (15%) The situation is different for module completers using online delivery, with 25% receiving a statement of attainment and 21% receiving a certificate of competency. A further 15% received no statement or certificate.

Table 5: Qualification received, by percentage, 2001

	Graduates		Module completers	
Qualification received from training	Online	Other	Online	Other
Statement of attainment			24.9	28.3
Certificate of competency or proficiency			20.4	20.4
Bachelors degree or higher	0.4	0.2	0.5	0.3
Advanced diploma	1.9	3.0	1.8	2.4
Diploma	16.1	13.5	8.5	6.7
Associate diploma	0.3	0.8	0.5	0.8
Advanced certificate—post trade	–	0.1		0.2
Advanced certificate—other	0.1	0.2	0.3	0.4
Certificate—trade	1.3	2.0	0.8	2.0
Certificate IV	15.8	15.2	6.9	5.8
Certificate III	27.7	29.7	7.6	8.2
Certificate II	31.6	26.6	6.7	5.4
Certificate I	3.7	7.1	1.8	2.9
Other certificate	0.9	1.7	2.0	2.2
Other course			2.0	1.2
No statement or certificate			15.2	13.1
Group total	**100.0**	**100.0**	**100.0**	**100.3**

Labour force status figures for 2001 data indicate that more graduates using other methods of delivery were employed full time (47%) compared to those using online (40%). The picture is similar for module completers, with other methods of delivery at 43% and online delivery at 37% (see table 6).

Table 6: Labour force status after training (at 25 May 2002), by percentage

	Graduates		Module completers	
Employment status	Online	Other	Online	Other
Total employed (full-time)	39.7	46.7	36.6	43.1
Total employed (part-time)	25.3	25.1	22.6	22.9
Total employed (hours not stated)	0.7	1.6	0.8	1.3
Total unemployed (looking for full-time)	10.6	7.3	8.7	8.3
Total unemployed (looking for part-time)	5.2	4.5	7.0	5.0
Total not in labour force	18.1	14.2	22.7	18.4
Total not employed (NFI)	0.4	0.4	1.6	1.0
Group total	**100.0**	**100.0**	**100.0**	**100.0**
Summary				
Total employed	**65.7**	**73.5**	**59.9**	**67.3**
Total unemployed	**15.7**	**11.9**	**15.7**	**13.2**
NILF(incl NE(NFI)	18.5	14.6	24.3	19.4

Note: NFI = Total not employed, NILF = Not in labour force, NE = Not employed

Table 7 demonstrates that, for graduates, the main reason for undertaking training was for vocational reasons. The online delivery proportion of graduates is 76% and the other methods is 74%. This contrasts with the module completers, where a lower proportion stated vocational reasons for studying. The online group were 61% and the other methods were 64%.

Table 7: Main reason for undertaking training, by percentage

	Graduates		Module completers	
Reason for training	Online	Other	Online	Other
Vocational	76.1	73.7	61.0	64.1
Non-vocational	23.9	26.3	39.0	35.9
Group total	**100.0**	**100.0**	**100.0**	**100.0**

In looking at satisfaction with the type of training received, the 2001 data indicate similar levels of satisfaction. Table 8 shows around 66% of the graduates who used online delivery are satisfied with the quality of the training by comparison with 67% of graduates who used other methods of delivery.

Table 8: Satisfaction—overall quality of the training (summary), by percentage

	Graduates		Module completers	
Satisfaction rating	Online	Other	Online	Other
Satisfied	66.0	67.2	62.7	63.6
Dissatisfied	2.6	2.3	7.2	4.6
Neither satisfied nor dissatisfied	31.5	30.4	30.1	31.8
Group total	**100.0**	**100.0**	**100.0**	**100.0**

Programs in online education

Data collection

Data concerning courses and modules within programs delivered online (using the definition developed earlier) were collected by obtaining information from registered training organisations (RTOs) and state central training agency websites. Therefore, the data collected were whole-of-state data in each instance, with no differentiation between public and private registered training organisations. All modules capable of being delivered in each state, including those delivered exclusively by private registered training organisations, are listed on central state registers. Website data were confirmed and verified with registered training organisations and state-based agencies during interviews. The state authorities and independent registered training organisations included:

- Open Training and Education Network (OTEN), New South Wales
- Learning Technology Branch, Office of Post-compulsory Education, Training and Employment, Victoria
- Online Network, South Australia
- Online at TAFE, Tasmania
- Open Learning Institute of TAFE, Queensland,
- Southbank Institute of TAFE, Queensland
- Northpoint Institute of TAFE, Queensland
- Moreton Institute of TAFE, Queensland
- WestOne, Western Australia.

The overall impression gained from these interviews is that registered training organisations across the country are offering and delivering online modules in a wide range of industry/occupational groupings. Generally, there is a high degree of conformity in the nomenclature and the identity of courses across the states. All states, except Western Australia record the Australian and New Zealand Standard Industrial Classification (ANZSIC) codes for modules and therefore direct comparisons are possible. Western Australia records the 19 Australian National Training Authority occupational groupings against modules and so these data are reported and analysed separately and cannot be used for direct comparison purposes with the other states. Appendix 9 lists the ANTA industry groups.

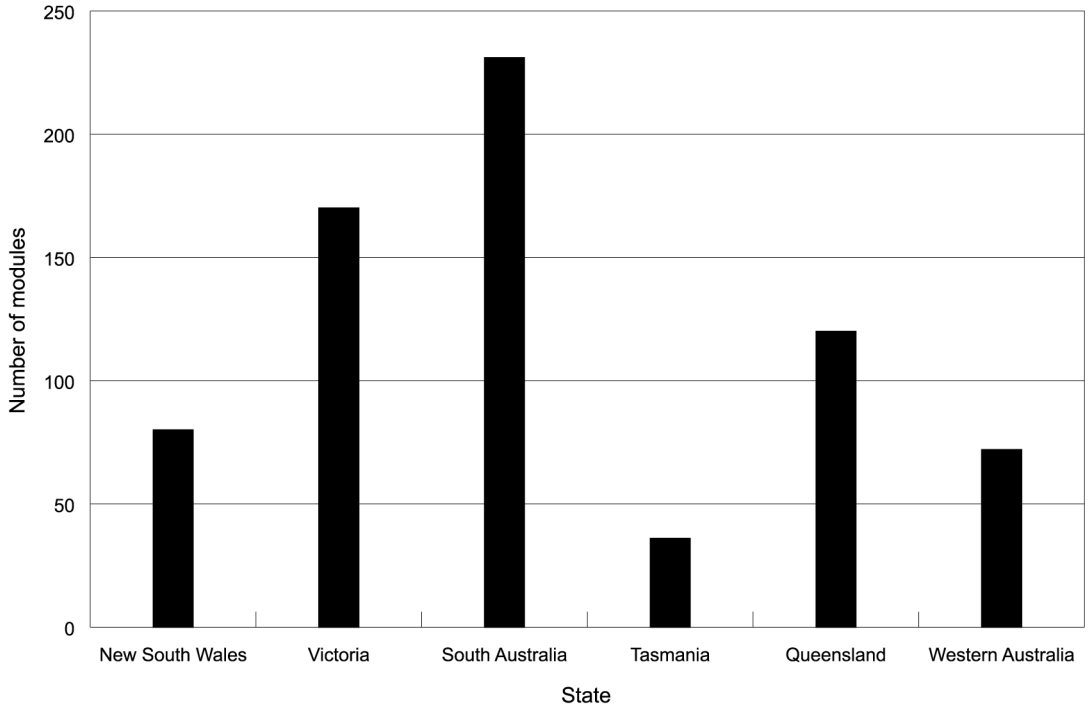
It is timely to note that collecting information of this nature would be a comparatively easy exercise if there was a central system of course/module nomenclature and the 19 ANTA groupings were being implemented uniformly across all states. The information collected from the state-based interviews is discussed under the eight questions designed to gather this particular data. For a list of the complete questions see appendix 7. Appendix 7 also contains a summary table (table 10) of the data pertaining to online usage in the VET sector discussed in this chapter.

Modules offered online in states

The information collected reveals that the maximum number of online modules is offered in South Australia, with 231 modules, followed by Victoria with 170 modules; Queensland comes next with 120 modules. In New South Wales 80 modules are being offered currently and in Western Australia over 70 modules have been developed by WestOne services and are being offered by nearly all the TAFE institutes in the state. Tasmania, through TAFE Tasmania On-line, offers 36 modules (figure 1).

There is a need to clarify that these numbers of modules do not include the online curriculum support materials sponsored directly by the individual TAFE institutes and the courses sponsored by the institutes for their individual use. In addition, several online, commercial non-award courses are offered by individual registered training organisations, comprising both TAFE institutes and private commercial organisations.

Figure 1: Comparison of modules offered by state, 2001



All the responding agencies stated that all the registered training organisations in their state were, to some extent, involved in online delivery. In Western Australia all the modules developed by WestOne Services are being used in some form by the registered training organisations; in Victoria 18 registered training organisations are delivering online courses, and in South Australia 10 registered training organisations are offering online courses. In Tasmania all the online courses are offered through Institute of TAFE Tasmania. All 16 institutes of TAFE Queensland are delivering online. In New South Wales 12 registered training organisations across 42 campuses of the total existing 133 campuses are offering online courses. The information relating to numbers of registered training organisations delivering online is based on the responses received in the semi-structured interviews and also by searching the websites of the individual registered training organisations. Once again the individual courses developed and delivered by registered training organisations may not have been captured in this list.

Number of modules delivered online by registered training organisations

The total number of modules delivered online in each state across institutes is often larger than the total number of modules available for delivery within a particular state. This indicates that the same modules are offered by more than one registered training organisation or that the same module is offered across more than one campus in a registered training organisation.

Table 9 shows the number of modules available and the number delivered and also shows how many registered training organisations deliver less than 20 modules, between 20 and 49 and over 50 modules. This information does not reflect total online activity in each state as it is based on a sample of registered training organisations in each state.

In each state, at least half of the registered training organisations sampled deliver less than 20 modules online. Very few registered training organisations deliver between 20 and 49 modules online in most states, with the exception of New South Wales (n=18). Only in South Australia and Western Australia were more than 50 modules delivered online by a registered training organisation, and this represented only one registered training organisation in each of those states.

Table 9: Number of modules delivered online by registered training organisations, 2001

State	Total no. of modules available	Total no. of modules delivered	No. of modules delivered online by registered training organisations			
			<20 modules	20–49 modules	50–75 modules	No. of RTOs in sample
New South Wales	80	784	24	18	0	42
Victoria	170	196	16	2	0	18
Queensland	120	69	12	0	0	12
Western Australia	72	331	7	6	1	14
South Australia	231	228	6	3	1	10
Tasmania	36	36	N/a*			*

Note: * Tasmania, through TAFE Tasmania On-line offers 36 modules online

Modules delivered totally online and modules supplemented by another mode

Totally online

The response to this question was mixed and it was interesting to note that the lecturers also determined the way a course was delivered. In New South Wales it was observed that 80% of the modules could be delivered totally online; however, 50% of the participating teachers chose to start the delivery as mixed-mode. This indicates that, of the 80 online modules, 40 are actually delivered totally online and the other 40 may be mixed-mode. In Victoria, of the 170 modules available, 74 modules are offered totally online; in Tasmania, of the 36 modules available, all except one are delivered totally online. In South Australia approximately 70% of the available modules are delivered totally online. In Western Australia it is difficult to estimate which modules are delivered totally online as the modules are developed by WestOne and the colleges may supplement them with another mode of delivery, with the probability of total online delivery for the remote students. The information from Queensland also indicates that, of the 120 modules on offer, over 50% are totally online.

Supplemented with another mode of learning

While many modules are intended for delivery 100% online, in practice it is not uncommon for lecturers to introduce face-to-face or campus-based content. This makes the process of determining whether courses are 100% online or mixed, problematic. In New South Wales approximately 20% of the online modules have some form of unavoidable face-to-face component and around 10% are designed to provide online theoretical underpinning knowledge for new apprenticeships and traineeships. In addition, nearly 15% have enriched learning materials on CD-ROM integrated with the online learning. In Tasmania the modules in the building industry area are supplemented with other modes of delivery but the remaining 35 modules are all totally online. In South Australia nearly 30% of the online modules are supplemented with another mode of learning or resources. In Victoria 131 modules are offered through mixed mode. The total is larger than this figure as more than one provider offers each module.

Actual number of students studying totally online/partly online

Most states appear to lack a central registry of students, making the task of determining the numbers of students studying online difficult. The following numbers are based on estimates supplied by state authorities. In 2001, South Australia has 2000 active online students out of total 4300 registered users. In Queensland there are about 3000 students studying totally online and it is difficult to estimate the number of students studying partly online. In Western Australia 6532 accounts have been established within WebCT, but this figure may be a combination of students and staff. In Victoria 10 300 users are registered in the Victorian TAFE Virtual Campus based on WebCT. Tasmania has a relatively fewer number of students (320) studying online.

Characteristics of modules

Alignment of modules with Australian Qualifications Framework 2–5

All the responding states indicated that the 92% to 100% of the offered modules aligned with the Australian Qualifications Framework (AQF) 2–5.

Modules equating to learning modules/units of course-based curriculum

All the modules in New South Wales and South Australia equate to learning modules/units of course-based curriculum. In Tasmania only the modules offered in access learning and environment health equate to learning modules/units of course-based curriculum. In Victoria all the modules are either learning units or elements of competency in training packages.

Modules equating to units/elements of competence in training packages

In Western Australia and Queensland all the modules are based on units of competence in training packages. In Tasmania, of the 36 modules offered, 35 equate to units of competence in training packages, while in New South Wales, 80% of the modules equate to training packages.

Online offerings in the industry/occupational groupings

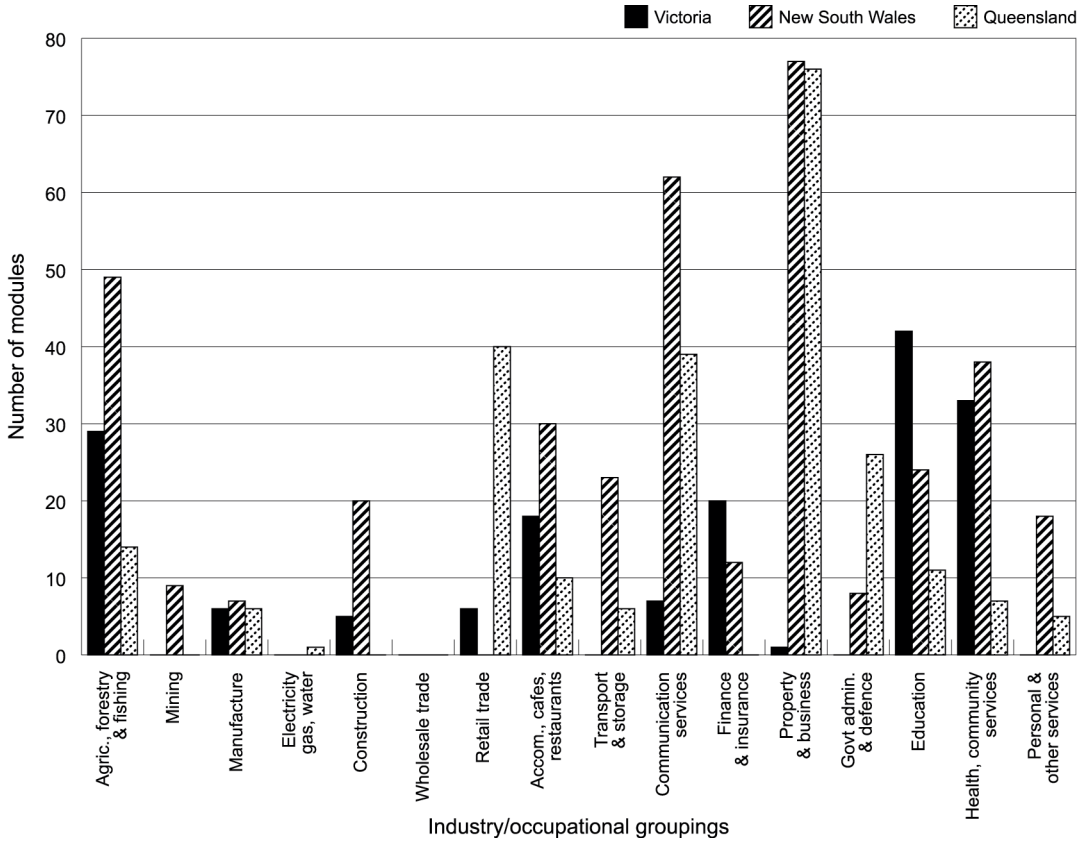
It was possible to obtain information on this question from New South Wales, Victoria and Queensland (see figure 2). It was not possible to assign modules to industry/occupational groupings in the other states, as many of the modules provided by the registered training

organisations did not easily lend themselves to industry categorisation. Attempts have been made to assign the modules to the industry groupings in Western Australia (see figure 3).

Different patterns emerge from individual states in relation to online opportunities offered in the different industry groupings.

In New South Wales property and business tops the list with 77 modules, followed by communication services with 62, and agriculture, forestry and fishing with 49 modules. The other popular groupings appear to be health and community services, accommodation, cafés and restaurants, and education. There are no modules offered in the retail trade area and the electrical, gas and water areas.

Figure 2: Online modules delivered in New South Wales, Queensland and Victoria, 2001



In Victoria, education with 42, and community and health services with 33, followed by agriculture, forestry and fishing with 29 modules, head the list of modules offered online. The other popular groups are the accommodation, cafés and restaurants and the finance and insurance areas. In six industry groupings there are no online modules offered at this stage. These are the areas of mining, electrical, gas and water, wholesale trade, transport and storage.

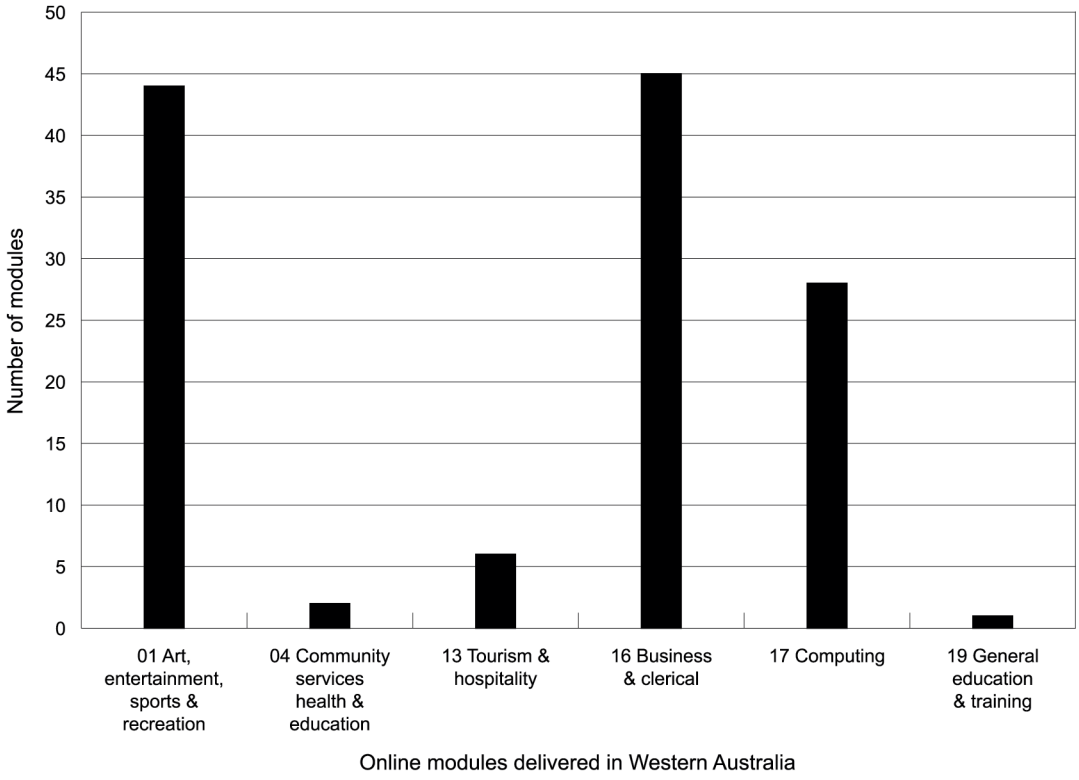
Patterns similar to those of New South Wales can be observed in Queensland with the maximum number of modules being offered in the property and business area (76) and communication services (39). However, there is a difference in that there are 40 modules offered in the retail trade area and 26 in government administration and defence area. No modules are offered in mining and wholesale trade areas.

Since the information from Western Australia is based on the Australian National Training Authority groupings which are distinct from the industry groupings used in this study, the information is being presented separately. The information provided by the Western Australian

Department of Training is based on the modules where students have actually enrolled for the module and may be indicative of the popularity of the groupings with the students.

Figure 3 shows that the three areas which have the largest numbers of students enrolling in online modules are arts, entertainment, sports and recreation; business and clerical; and computing, all with numbers around the 45 mark.

Figure 3: Online modules delivered in Western Australia, 2001



Across the states most of the industry categories were covered by various online modules, with the exception of: wholesale trade; electrical, gas and water; manufacture; mining, where relatively few modules were offered. Industry categories widely covered by online courses included: agriculture, forestry and fishing; accommodation, cafés and restaurants; communication services; property and business; education; health and community services.

As noted earlier, most states lack a central registry of students and individual TAFEs are also unable to provide information on registered online students. Because so little information is available on student online enrolment, it is difficult to say which modules are most or least popular with students, although one indicator could be the number of modules offered in each of the industry groups. Overall, the most popular industry groupings for online modules were property and business, communication, agriculture, forestry and fishing. Clearly, the industry group of electricity, gas and water was the least covered, with both mining and wholesale trade also with few modules on offer.

Teachers and developers in online education

Introduction

The chapter outlining the methodology adopted by this project explained that data were gathered from teaching practitioners in two main ways:

- through the online survey paper-based survey (137 respondents, a 25% response rate)
- through semi-structured interviews (with 16 respondents who indicated on the paper-based survey that they would be prepared to engage in further detailed data-gathering).

The information gathered from the survey reflects the specialist areas of the respondents and the distribution of courses with a strong online component. There are areas where we would, for example, expect to find more female than male staff, for example business and administration. They might also be assumed to have a different pattern of qualifications than the trade and technical areas.

Online teachers

As a result of the analysis of the survey, the project team developed a snapshot of the typical teacher involved in online delivery in a TAFE institute in Australia in 2001.

- The teacher is more likely to be in the 35 to 49 year age group (58%), followed by the 50 to 59 year age group (28%).
- The largest number of these teachers will be located in capital cities, with only a third in regional cities, and less than a quarter of their total number working in country areas.
- The teacher is more likely to be female, with at least a basic undergraduate qualification, and a teaching background in an area such as business, administration and social science, education, or information and communication technology.
- From data gathered during the state-based interviews, it would seem that the teachers are engaged in the delivery of modules which are aligned with the AQF at levels 2–5.

The teacher's role in online delivery is likely to be a complex one, often as a deliverer and developer, and also a manager of the process or people. The teacher is likely to have worked in the area for at least two or more years. Almost 30% of teachers engaged in online delivery have developed their own content and another 30% have had their content developed by a group in their teaching area. Smaller numbers use an institute-based courseware development group; others use an external courseware development group.

More widely, teachers demonstrate an understanding of online delivery that is grounded in the value of flexibility for the learner and the teacher. They believe that online delivery:

- ‘enables freedom from time and schedule constraints and lets students integrate their learning into home or work life’
- ‘means doing a course at your convenience using technology and support’
- ‘is using technology as a resource either remotely from a distance or within a classroom’.

The teachers are less likely to believe that online delivery:

- ‘provides materials as support only and does not provide a real learning environment’
- ‘is working off a CD-ROM either at home or in the classroom’
- ‘means teachers become tutors rather than deliverers of a course’.

This understanding tends to support the view that those who develop and deliver online programs are focussed on the growth and development of a pedagogy of online education. The staff involved are treating the online environment as one in which sound educational principles for teaching and learning must be embedded. These practitioners, therefore, define learning as an educational process, and give low ratings to those definitions which place online learning within a simple technology position. Thus they emphasise the various educationally oriented definitions while de-emphasising the technical or functional delivery items.

Overall, it appears that teachers work in relative isolation in their delivery of online modules.

How are teachers delivering online material?

Over half of the teachers involved in this work deliver their subject totally online. This means that there is unlikely to be any classroom contact, or workshop/laboratory/fieldwork contact for the subject. Approximately one-quarter of the teachers deliver interactive material on the web, while one-third of the teachers use static web material in 25% of their delivery. The use of the CD-ROM is still not usual, with the DVD being used to an even lesser extent in their online delivery. Finally, the majority of teachers do not have their material locally installed on a computer, server or network, choosing instead to work from an intranet or internet.

How do teachers communicate in their subject?

Only about 20% deliver pre-enrolment information totally online. Some offer the subject handbook or study guide materials totally online, and about half of them provide class notes/handouts totally online. The vast majority of teachers and students communicate using email, with newsgroups/bulletin boards also rating highly. Over three-quarters of teachers enable online submission of assignments or portfolios, and about 70% of teachers engage in chat room discussion.

Assessment

There is little information on the ways in which teachers enable assessment online; however, it appears that over half of them enable formal assessment tasks totally online, while almost two-thirds do the same for self-assessment tasks. This flags an area for further research—the extent to which online mechanisms are being used for assessment purposes and for validating the students’ work.

Online education developers

The following information is gathered from 16 respondents representing institutes around Australia, to whom the semi-structured interview instrument was applied (appendix 6). As such this

information provides a descriptive account of the teachers' or managers' practices in online initiatives.

Responses indicated that teachers believe that online learning is not a uni-dimensional concept. It seems that they do make distinctions between online as a convenient and flexible way of providing learning, online as student-centred and collaborative, and online as outside a physical classroom. In contrast to these notions is online as a technology resource.

In an attempt to generalise from the data it could be said that the teachers and developers appear to fall into three groups:

- those embracing the online teaching-learning environment
- those who are simply tuned into the online world
- those who are deeply engaged with the electronic learning milieu.

The first group is typified by an interest and involvement in developing online materials partly because the teacher recognises that this is a pedagogically effective activity. The second group do not show a clear understanding of pedagogical issues surrounding a move into the online teaching–learning environment but are engaging in it because they are committed to the internet and online activities. The last group can be seen as belonging to the ultimate level of the online culture in what can be called the *virtual delivery culture*, a culture that is populated by people who are committed to the development of online delivery, who see its structure and possibilities and who have norms which reflect best practice in their educational culture.

An issue to be recognised when attempting to determine how online education can develop and how policy can lead this is that there appear to be too few people in education who understand the *virtual delivery culture*. A large proportion of educators tend to be unaware of the world of distributed computing and pervasive computing, where technology, techniques and ideas focus on the delivery of information in ways yet to be fully operationalised. Those who belong to the virtual delivery culture are fully aware of most of these issues.

Support for online learning development

More than 50% of teachers involved in online education receive only partial or no funding at all for their online subject or course. Where funding is provided, it comes from state projects or from institute or departmental funds. There is little indication of direct commercial sponsorship in projects, with only one example of a teacher being in a position to have online developments funded through external contract work.

The problem for many of the teachers involved in developing and supporting online learning is that online learning is being heavily subsidised, in most states, through grant and project money and through a policy directive encouraging individual institutes to become involved. The provision of a common platform such as WebCT may make it easier to develop online courses, but the skills needed for creating any form of online delivery are very different from those needed for good classroom delivery. Major research projects are urgently required to explore the skills and competencies needed by a teacher to enable effective development of basic online materials—without considering the actual development of the on-screen materials.

While online developments are useful, they reflect, at times, a reaction to pressure for the development of materials to be presented online rather than reflecting well-considered educational processes. This situation was evidenced by a number of teachers who believe that their institutes view the development of online programs as a potential source of revenue through the sale of developed materials or through attracting fee-paying students. These comments were counterbalanced by those who indicated that they were in a positive environment where their

institute and/or state was actively developing, or supporting the development of, online material for the benefit of their own students' learning.

A real concern of teachers is that online courses are not easy to update. Updating is no longer a matter of changing a couple of overheads and handouts—'now you have to go back in (if you have the skills) and modify the structure of a set of learning materials'. This concern with the difficulty of updating course materials is broadly based upon the inherent complexity of having materials converted to online learning materials rather than being in the hands of the teacher—materials are now in an environment where the teacher may not have the expertise and/or the ready access to make changes. The potential impact of this factor on the cost of delivery appears not to have been fully explored.

A number of teachers identify the possibility of commercialisation of products. There were two specific instances where a course had been purchased by others or where fee-paying students were being attracted. The opportunities in this area have to be seen in the context of the wider international arena. The reality is that the online globalisation of education is a slow process and is unlikely to provide significant financial return in the short term.

In the data gathered, committed teachers/developers of online programs were distinguished from those who appeared to be involved simply because they perceived that 'this was the way to go'. This was made evident by the following comments:

> There is a lot of discussion about what is needed for online delivery. I think people are making too much of it. I found some good online material from elsewhere. It didn't cost very much to get a license and it took very little effort to get it up. Everyone is happy.
>
> I try to co-ordinate what is coming in from teachers so that we have some real quality control. Unfortunately, too many of them think, that by putting a set of teaching notes up on the web, they are putting their course online. Management doesn't see the need for staff development but they want online delivery.
>
> I saw this is the way to go. The subject matter could easily go online. I just took a bit of ingenuity. The only problem was the worry that the local bandwidth would make it all too slow.

Some elements of the difference inherent in the quotes above might be described in terms of those who appear to operate in the online environment in a 'sophisticated' way, and those who adopt a more 'functional' approach. Those who might be defined as demonstrating a sophisticated approach are teachers or developers who have a reasonable level of knowledge about online software and hardware. These people appear to be tuned into many of the key delivery issues and seem to be aware of the national and international factors driving technologically mediated teaching and learning options. Those working in a more functional way are often not conversant with the world of 'online'. They are likely to refer technical issues on to those with more expertise. While they do not lack ideas about online learning, they are unlikely to be tuned into the technology and software issues. An awareness of these differences will be important in the design of professional development to support more staff to become competent in using online methodologies.

Innovation and best practice

Developments in online learning materials are seen as impacting upon educational innovation in all levels of education. At the simplest level, we might say that any new subject or course, which is presented in an online format is an innovation. However, while it is novel and contextually original, it is often not pedagogically innovative. Where the teachers or developers presented innovative, pedagogical thinking, its importance was obvious. Those interviewees who were looking at the next shift of online delivery capabilities (high bandwidth, synchronous learning, wireless technology) were those who had both educational and technological vision.

An interesting issue in this context is the range of difficulties people face in trying to define their target population for online delivery. The argument that they were now able to provide courses to students who would previously not have had access is difficult to follow. Traditional distance and flexible education is arguably more flexible than online delivery, and less expensive because it does not need either specialist technology, potentially expensive internet service providers or information technology skills on the part of the learners. Again, marketability assumes that you understand your target population.

The organisation and online activities

Teachers generally see the development of online activities as being, in some way, related to organisational goals. However, few teachers are able to locate this activity within the structure and goals of the organisation's corporate plan, or seem able to articulate the role of online delivery in the future direction of their organisation. It might be said that even the relatively clear statements were rather vague on specific information. For example, one Victorian interviewee stated: 'We want to have 20% of courses online in the next few years'. This could be seen as an example of the rhetoric fostered as a result of the requirement embedded in one of the service standards of the 2001 institute performance and monitoring agreement between institutes and the state government.

Isolation and networking

Many teachers and developers indicate that they operate in relative isolation, or at least started out in relative isolation. Any networking currently occurring appears to be driven by state/system-based initiatives and not by teacher community drivers. There is some indication that the institutes, which are looking to the global educational market, are not especially interested in networks as such. In these institutes, commercial imperatives drive decision-making, and programs are being motivated by prospective earnings for the institute—by the benefits offered by online learning in terms of service provision to the end user. This is a pattern which appears to be emerging across all education sectors where developers have commercial outcomes as a goal.

A likely impact of this isolation is that educational and technological motivations and methodologies may not be disseminated between groups working on online education. This may not directly limit the scope of online learning but it creates inefficiencies that may impact on the effectiveness of delivery.

Development and maintenance—skilling the teachers

A relatively common theme emerges from the data: the need for the self-driven, on-the-job-training that has characterised many of the stages of development of the online courses. Some teachers and developers speak of working alone, often in their own time, searching out information from wherever it is available. Being given a role that enables them to have management of online development in their area has rewarded some teachers. However, it is unclear how much formal training and development support should accompany this position.

Online teachers indicate that they are acutely aware of the lack of skills in online materials development in others with whom they work; for example, one teacher commented that a colleague learned to turn teaching notes into an HTML document and termed that an online course. This raises the question of what is defined as quality in online materials creation. It would be impossible to set external standards to cover all possibilities, and the template method used by some organisations and providers generates sameness rather than consistent quality. Furthermore, some teachers and developers make it very clear that online learning is not for everyone. They note by way of example, the tension created when a course aims to service a wider social and/or cultural group—a group which either does not have computers or the proposed delivery methods are outside the range of cheap and reliable internet services.

Technology and implementation

Overall, there does not appear to be a consistent pattern of software usage by teachers and developers. While some interviewees demonstrate little knowledge about the technical issues, a number of people indicated that they had used almost all applications listed in the survey instrument at some time or other. Some of the more experienced developers appear at ease with the technology commenting:

> I rough things up in Front Page. It usually comes out about right. Sometimes I have to go down to the HTML code level to fix things Front Page can't handle.

A small but distinct set of teachers are using materials which had been packaged by others, ranging from a unit that had been developed by another TAFE institute to courseware materials included with a textbook. These teachers appear satisfied with what they have brought into their teaching environment, although no comparison has been carried between packaged and custom-developed materials.

An illustration of the intention and the realisation

It appears that there is an interesting spread of reasons for putting courses online. As an example, it is useful to look at Illawarra TAFE and their Extractive Industries Certificate to see a story of opportunity, educational effectiveness and market responsiveness.

> With the changing structure of the mining industry in the Illawarra area, due to the declining coal extraction, the TAFE system found that it had a number of courses for which there was no real market. Through sensible market research, they found that a very under-serviced area was quarry mining. It had a bad public image but it was large. In the coastal region for about 100k. around Sydney there may be some 5000 operating quarries.
>
> They looked at what they had been teaching and how this would fit with extractive mining and realised that it was a goer. An additional driver to it going online was that the industry needed some skills-based training for its graduate intake. An online course provided a good base to cover a dispersed market. But it also helped cope with the changing life-style of engineers and operatives in the mining industry. No longer were mining towns being built as the centre of a mining operation. Staff were being flown in for an on-site period and then flown out again. Training had to be provided in a flexible and accessible format. Now the course is international and the first such course in the online world.

Examples of teacher/developer practice

Curtin University of Technology

Curtin University of Technology has a campus which is a regional centre catering to the needs of students in the Kalgoorlie and Esperance regions and the nearby areas. In the area of VET most programs offered have some online component and the site offers courses in most industry areas, with the implementation of most training packages. The Kalgoorlie and Esperance campuses of Curtin University are unique in regional Australia, offering senior high school studies through Eastern Goldfields Senior High School (Kalgoorlie Campus), vocational courses through the Vocational Training and Education Centre, undergraduate and postgraduate university courses through Curtin College of Higher Education, and specialist mining undergraduate and postgraduate degrees through the Western Australian School of Mines (WASM).

Most VET programs at Curtin utilise online delivery to some extent. It is a major mode of delivery adopted by programs in information technology and administration (office). Online delivery is utilised in only a small number of higher education units of study in Curtin College of Higher Education and the Western Australian School of Mines. There are seven lecturers, six of whom are

involved in facilitation, the other being a facilitator/course co-ordinator. While all staff are using developed materials, one staff member is co-ordinating the course and providing access to students to the course through WebCT.

The teachers make good use of discussion groups, and a large number of students use chat rooms. Teachers upload the students' final assignments for presentation via a PowerPoint display on the WebCT. They use email to maintain contact with students.

While still in the process of setting up online services for students, Curtin University has established a standard for the online teaching process. This includes the 'badging' of modules with an icon termed 'standard online teaching'. Once the course is badged, it is linked to student feedback to gauge the quality of the course. This is being trialled for the higher education sector to standardise the quality of their online courses.

Diversity is managed through online communication tools. They use student tracking to determine how students are accessing and progressing through the course. When a student is observed experiencing difficulty, teachers maintain communication and adapt their facilitation to suit the student's learning style, with further support provided via telephone.

Professional development is facilitated via WestOne. The university is delivering a program called E-training for Professional Development of Staff, which will be facilitated on campus and offered on a regular basis. More professional development is required for the actual improvement of the delivery of courses, adapting teaching skills, and value-adding to the learning resources available. In addition, professional development is required in relation to the use of discussion groups and facilitating in an online medium. A staff representative believes there is little advantage in developing staff to develop online material, as they do not have the resources or the time available. Staff would prefer to use WestOne and ANTA Toolboxes, maintaining that it is more important to use professional development resources to enhance their capacity to deliver the available programs more efficiently.

New England Institute of TAFE

New England Institute of TAFE (NEIT) has campuses in the Northern Tablelands of NSW, including Armidale, Glen Innes, Inverell and Tenterfield, and on the slopes, including Tamworth, Quirindi, Coonabarabran and Gunnedah. Campuses on the Western Plains include Narrabri, Moree and Boggabilla.

The NEIT contact staff member is a plant mechanic who entered the training area. Earlier in his career he had recognised the potential impact of computers and online delivery on vocational education, particularly in non-urban areas. He obtained qualifications in the fourth generation computer languages, and has also obtained educational qualifications. Now he is in a position where he looks at the world from three different perspectives: technical specialist, information technology and educational theory and practice.

At NEIT, online delivery is being placed within a definable educational context. It is not tagged onto the end of other activities; rather, it is given its own structure and this includes staff orientation. The staff orientation program can be cited as best practice: 'We use the analogy of the classroom to take away the fear factor of online delivery. In training and orientation the classroom analogy is maintained.' There is an actual orientation program which is run over 2–3 days, and in addition as part of small project teams across areas. An important element in this is that the teams come back together to report on what they have done. The basic area of action relates to content development and instructional design; however, this is being extended as a more pedagogically sound approach. In terms of evaluation, the primary concern is that the learner gains the skills the subject is intended to deliver.

NEIT has no simple source of funding for online initiatives. The institute has gained support from TAFE Online; indeed both the information technology course and the veterinary nursing course

were funded from this source. The staff orientation program is usually funded by individual faculties. Many comments were offered about how resources were made available for developing projects and about how many TAFE institutes have appointed people to act as co-ordinators for online development. By developing its own culture NEIT appears to have been ahead of its counterparts. This appears to have been the result of some forward-thinking on the part of institute management, coupled with the presence of interested and involved staff. The developments at NEIT have been driven by the appropriateness of the course for online initiatives. Another driver has been the type of market to which a course could be delivered. It was noted that some courses are functioning with the basic NEIT footprint, while others take advantage of the training places in a wider region. Where there are the resources, online options are taken to the global education environment.

The general policy of NEIT appears to be that if a course can be delivered online and there is a clear market for that mode of delivery, effort will be put into getting it up and running. The veterinary nursing program was a flexible delivery course and the institute was looking for ways of making it 'more flexible'. The students were seen to be a suitable group for web-based learning. Consequently, the material was redesigned and restructured for online delivery.

NEIT could be said to have a clear educational subculture, which encourages, facilitates and supports online delivery. The organisational push for developing online materials in the institute is strong. Staff are supported by management in attending conferences on e-learning so that they are aware of what is happening and therefore better able to support development. Faculty managers are encouraged to seek information and to explore resources to enable them to develop or improve the e-learning materials.

NEIT seems to have adopted a clear infrastructure policy, which emphasises the need for reliable technology to support online delivery. Such an approach is essential if an educational institution, at any level, is to provide a true virtual learning environment. Unsupported servers mean unacceptable downtime. Furthermore, there is a basic sense that online delivery has to involve skills development on the part of staff who will develop materials. NEIT's orientation program should be carefully examined as an example of good practice in the area of staff development.

Victoria University TAFE Division (VU TAFE)

There are 14 campuses of VU TAFE. Most are situated in the Western suburbs of Melbourne, with campuses located in the city, Footscray, St Albans, Melton, Werribee, Sunbury and Echuca. VU TAFE has a wide range of programs which cover the full range of VET delivery. These include engineering, information technology, trades, business, arts, beauty, hairdressing, retail, printing, hospitality, and community services.

VU TAFE is part of a dual sector higher education–TAFE institute. Higher education and TAFE at VU work as separate entities, with most communication between the two sectors taking place through committees. These are typically not joint committees but are generally based within the university or TAFE, each with a representative from the other sector.

In terms of professional development, the staff also have access to a whole series of professional development courses, which are run by the university sector of VU and are designed for people who want to become involved in online development. For example, the university is currently running a course to upskill people in the use of WebCT. In addition there is a Centre for Educational Development that provides training and support.

Staff in the 'designated projects' area actively try to encourage more people to become involved in online development, but find this is difficult. One mechanism they use is to make sure that each new project has at least one person on the team who has no experience with online development. Through personal networking, staff specifically target people who show some interest in developing or using online. Networking also helps establish project teams of people who can work well together.

The initiatives for the online development work that has been done have come from the teachers within VU TAFE. The teachers who become involved in online development and delivery are generally interested in working with the technology and exploring the possibilities of using online materials in their teaching. However, they are not necessarily interested in delivering online. The Public Life Past and Present and Text and Culture I modules are recent and current online development projects. These modules are taught in the Diploma of Liberal Arts, within the Arts and Preparatory Department. The staff who taught these modules in their original format were keen to have online material to use in their classes, and approached a representative of the projects area for help with the development.

The development of these modules presented a challenge because they had more content than is normally incorporated in online material. The modules were developed for the TAFE Virtual Campus and designed to be used as stand-alone modules, as specified in the TAFE Virtual Campus tender. Nevertheless, these modules will be delivered with a classroom facilitator.

There is a keen awareness of the access issues which online development needs to address for students who have difficulty studying on campus, for example part-time and shift work students. The teachers however, believe that online can be used 'anytime, anywhere, any place'. Another important aspect of access considered when developing online modules, is that the material could potentially be used by anyone. Therefore the staff always attempt to ensure that the language and examples used are appropriate, inclusive and non-offensive. Furthermore, as people with a wide range of abilities generally use the material, they are careful that the academic content is comprehensible, or provide strategies to make it so.

There is a desire in the projects area to move away from whole course development and instead develop small modules or cameos for courses. This would allow teachers and students, inexperienced in online, to be introduced gradually to the online mode of delivery. This is particularly important at VU TAFE because their constituency comprises large numbers of mature-age learners who may not be as familiar or comfortable with the technology as younger age groups. Furthermore, online delivery is not always appropriate for entire modules.

One comment was made about the short life of online development programs. The project manager develops self-paced learning materials for the women's education course and every two years she has to throw it away because it is no longer relevant. She feels that in the end there will be a move toward more generic materials because the effort and cost involved in online development does not make it viable for small courses or courses which undergo change regularly.

In summary, the online development work at VU TAFE is not uniformly spread across the departments but this is not uncommon in TAFE. The extent of online development work in VU TAFE is not accurately known, and the general feeling is that there are probably other online development units and online development work going on elsewhere. There is a commercial arm of VU TAFE which undertakes a significant amount of work for industry in the form of training and development. They operate with a different model, and although the open learning unit is also located near the Footscray campus of VU TAFE, there is little communication between the two.

Conclusion

These three examples of the work of teachers and developers in three TAFE institutes provides clear evidence of what can only be described as developmental work in the area of online education practice. While there are clear pockets of highly innovative practice, these are small and isolated. High commendation must be given to those staff members who struggle against what seem to be nearly insurmountable odds to develop and deliver online learning opportunities for their students. For these efforts to become not only more widespread, but also more a consistent, effective, attractive and accessible activity in TAFE education, a number of points should be strongly emphasised:

- A coherent database of online development activity that enables staff to network with each other and share resources and ideas should be established.
- Consistent and co-ordinated support through national, state and institution governance and policies in order to raise the profile of the value of online access to learning opportunities as a valid mechanism for integrated education and training across Australia, within and across states, and within an institution, should be set up. It is clear that the level of shared knowledge even at institute level is sadly lacking. This will require funding to enable teachers and developers to be able to take 'real' time to access networks, in order to revise or develop new educational opportunities and content which includes the 'online' option as a strong and valued one.
- A set of guiding principles for curriculum and training packages that clearly define online activity as one of a range of valid pathways to accessing current quality education should be developed. The purpose of these guidelines would be to ensure the consistent and appropriate development of staff who wish to work in this area, and provide a sense of value and worth for these staff.

Discussion

The use of online learning and delivery in the VET sector has proved to be a complex issue, particularly because of the interstate variations in policy, practice and delivery. Consequently, any discussion of the outcomes of the project must be tempered by the understanding that the VET system being considered is not a coherent and uniform one. Much of the reported variation results from trying to reconcile disparate positions.

In addition to this underpinning complexity is the fact that much of the data collected here represent the first attempt to systematically collate information relating to online delivery of VET educational programs at a national level. The literature indicated that educators are writing about and researching online delivery and associated issues. However, most of the effort is being carried out, as might be expected, at a state or local level, creating a situation where there is no basis from which to cross-validate the findings from the project against previous findings.

Defining online learning?

What are its key features and variety of forms?

All of the data and information collected in this project, coupled with that found in the literature, indicate that there can be no single definition covering online learning and online delivery. Consequently, this report has generated summary definitions of learning and delivery that are quite general in nature.

The definitions also operate within the constructivist assumptions about involvement and participation by students, yet there appears to be little evaluation made of how these assumptions function in the online environment of the VET sector. There would appear to be a need for a teacher-oriented program to provide staff with an evaluation tool-kit which is both relevant and practicable.

The actual data, particularly that extracted from the surveys, highlight the multi-dimensionality of the concepts integral to the online environment. Analysis of these data suggested that a set of primary distinctions can be distinguished—online as a convenient and flexible way of providing learning, online as student-centred and collaborative, and online as outside a physical classroom. In contrast to these is the view that online is primarily about technology resources.

During the process of generating the various definitions for the survey form, it became clear that the informants were talking in terms of what is happing now and not what is being developed for the future. In this context, the definitions of online learning and delivery are static by comparison with the rapid changes being experienced in electronic communications technology and the parallel research into learning behaviour in electronic and virtual environments.

This project has identified a need for research into the way students respond to online VET courses since most of the published research has been done overseas in the university sector or in the school sector.

Who is getting online learning?

That the 2001 student outcome survey statistics show very small numbers completing modules in online mode is an issue which must be faced and addressed. Only 2% of graduates used online delivery as a study mode. In the 'Students who used online study' section, the characteristics of this group are described. Unfortunately, it is not possible to make any real extrapolation to a possible online student population.

From the results of the online survey data, there was no indication from respondents that the students engaged in online activity were markedly different from the 'standard' delivery student population. The literature does not appear to provide any indicators of what might be expected in relation to student characteristics, although there have been some suggestions concerning the characteristics of a successful online learner. Misko (2000b, p.12) indicated that these learners have some basic familiarity with computer skills and have the motivation and ability to work independently.

The proportion of the current crop of online learners who possess these attributes was not addressed directly by this study. Before this issue could be addressed more refined data collection would need to be undertaken by training organisations delivering online programs. A wide variety of learners with varying characteristics may be attracted to online modules for a variety of reasons. What *is* known from other recent research is that about 70% of students starting a course as an online learner never complete it (Islam 2002).

In any case, the success or otherwise of online learners will depend not only on their own inherent capabilities, skills and motivation but also on many other extrinsic factors such as:

- a reliable environment in terms of support given for technology, intellectual pursuit and social cohesion (Brennan 2000b)
- a sense of ownership and community amongst the learners (Cochenour & Reynolds 1998)
- other pedagogical issues related to materials development, including approach (for example, constructivist, problem-based learning etc.) and appropriate instructional design for online materials (see Brennan 2000a, p.52).

To date a number of multiple factors which may lead to success or otherwise for online learners (Mitchell & Bluer 1997) have been identified. It is problematic nevertheless, to draw any conclusions about the relationship of student characteristics to success in an online environment.

Access and equity issues

There are no clear indicators from the project that online learning is having much effect on access and equity issues. The qualitative data suggest that there is a range of issues relevant to the provision of programs that can impact upon key access and equity issues. The response to the survey questions indicates that access is certainly limited by technology issues such as lack of training in and knowledge about technology use. Regional access is dependent upon the quality of telecommunications support. An indirect indicator of the importance of support is the high number of online learners in capital and regional cities compared to rural country areas.

Not withstanding the fact that population size will directly affect the size of the available online student market, the relative numbers appear to reflect the learner support available in terms of the three factors highlighted above—lack of training, lack of technological understanding and quality of communication support—for students closer to actual training providers in capital and major regional centres. Therefore, one characteristic of current online learners is that they expect and

need high levels of institutional support and this is not as readily available in country areas. This is supported anecdotally by responses in semi-structured interviews conducted by the research team.

There is a very basic question about technology and gender. Some of the interview evidence appears to support the idea that computers are aligned with technology (male) rather than communication (female). The research generally supports this finding (for example, Busch 1995; Whitley 1997) but others report a different result (Pitman, Gosper & Rich 1999). This apparent contradiction offers pointers to possible further research. Research to identify the behavioural dimensions of gender differences in attitude to electronic communications technology with particular reference to inhibitors to uptake of educational programs could be undertaken. So also could research which relates to the ways in which non-keyboard means of interaction with the computer might help reduce negative impressions of technology. Thirdly, gender differences might be expected to occur along occupational lines; for example, it could be expected that the more male-dominated occupational fields would be over-represented by male online learners. In more traditionally female dominated fields, such as office administration, the reverse could be expected.

Types of programs

The data collected from each state indicate a fairly extensive use of online delivery in all the areas. This is discussed in following sections.

Capital city versus regional/rural participation

From the results it is apparent that the greater proportion of online modules are delivered by regional/rural registered training organisations for the majority of states (for example, Queensland, New South Wales and Victoria). Online modules are universally available if offered via the internet, as opposed to a closed intranet. However, the ancillary support so often cited in interviews as a most important factor, requires that learners be reasonably close to their support. Therefore, the significance of the proportionally large number of online offerings from the regional/rural centres should not be underestimated. This could form the subject of a further study looking at how the proportionately larger number of offerings in regional/rural centres contribute to success rates amongst online learners.

Proportion of the total program offerings in a particular occupational industry area

The data suggested that, across the states, most industry categories were covered by online modules. The industry categories most widely covered were:

- ✧ agriculture forestry and fishing
- ✧ accommodation, cafés and restaurants
- ✧ communication services
- ✧ property and business
- ✧ education
- ✧ health and community services.

The exceptions where relatively few modules offered were:

- ✧ wholesale trade
- ✧ electrical gas and water
- ✧ manufacture and mining.

It should be noted that many of the modules provided by the registered training organisations did not easily lend themselves to industry categorisation. This was particularly an issue in Western Australia and Tasmania where course and module titles indicated cross-industry content. These states were not able to fit the modules into the standard Australian National Training Authority industry groups used by the project.

One aspect of determining coverage is the uptake by students of online modules. Unfortunately, the states are not able to provide details on enrolment numbers within modules, with limited information on distribution of industry groupings. The data collected give us a basic indication of the extent to which industry areas have been covered. What is lacking, and what could not be obtained at this stage in the development of online education, is the relative proportion of coverage and real areas of shortfall. Also, it was not possible to identify the issues that determine the likelihood of implementing a module in online mode. Related to this is the problem of assessment in a number of occupationally related courses. The project was not able to get a clear indication of how assessment is undertaken and how this influences the development of online materials.

What do we know about how teachers feel about using an online approach?

This question has been approached from a number of directions. Through the initial contacts with the institutes, an attempt was made to establish the best contact point for this task, the intention being to forward the surveys to those who were clearly doing work in online delivery and learning. The interviews and case studies were then intended to provide a more qualitative approach. Finally, the collection of data on what was actually being presented online could give some indications of the broader scope of online usage, at least by extrapolation from the areas being presented.

The reality was that the number of staff who could be identified as currently working on online materials was relatively small. This had consequences for the final size of the survey sample and for the range of possible interviews.

The qualitative approach has provided us with some descriptive information on who is developing materials. As noted earlier, there appear to be three groups: those embracing the online teaching–learning environment, those who are deeply engaged with the electronic learning milieu and those who are simply tuned into the online world. Another way of categorising those who are developing online materials is by describing them as 'sophisticates' and 'functionals'—those who seem to operate in the online environment in a 'sophisticated' way, and those who adopt a more 'functional' approach. 'Sophisticates' are teachers or developers who have a reasonable level of knowledge about online software and hardware. These people appear to be tuned into many of the key delivery issues and seem to be aware of the national and international factors driving technologically mediated teaching and learning options. People who might be termed 'functionals' are not expected to be very conversant with the world of 'online'; they are likely to refer technical issues on to those with more expertise. While they do not lack ideas about online learning, they are unlikely to be tuned into the technology and software issues.

In the course of this project teachers have also raised issues about cost and online delivery. There was fairly clear agreement that online delivery is unlikely to be a cheaper alternative, particularly where the educational materials have been specifically developed for the online environment. The point was made that it is much more difficult and costly to update online materials than classroom materials.

General issues and future directions

In this section we have identified how the information collected for the project could be improved and noted key issues that still need to be addressed.

Innovation and best practice

The analysis of the data, as well as the review of the literature, have failed to provide effective criteria for either innovation or best practice in online delivery or in the evaluation of online educational outcomes.

While this area is in need of serious research, potential research opportunities are hindered by the lack of any clear educational models which could assist in defining online education in a way that emphasises its similarities to, and differences from, conventional delivery modes such as face-to-face, paper-and-pencil and audio-visual distance education. This lack is further exacerbated by a lack of research into the way mixed-mode subjects and courses impact upon student learning.

The urgency of this task is heightened by the way in which technology is rapidly increasing in sophistication. At the same time the software is providing wider options while educational models are static. As some respondents asked: 'Is the technology driving the educational activities?' There is anecdotal evidence to suggest that online delivery may be inhibited because developers are using software tools that create resources generally inappropriate for all except those users who have fast and reliable cable access. For example, websites with animation are very slow, and interfere with continuity of information delivery on a normal 56k modem on a PII/PIV Celeron—the computer configuration that appears to be the most commonly used configuration in Australian households.

Access and equity

There are no clear indicators from the project that online learning is exerting a significantly positive effect on access and equity issues. While technology and telecommunications issues affect potential users, there will be limits to potential users of online resources.

Question 5.10 of the survey asked, through an open-ended question, for comment on online delivery in relation to access and equity issues. Fifty-one respondents replied and there was a range of responses. About 90% highlighted the failure of online approaches to improve access and equity, although some were optimistic about the future if resources were made available. Some respondents indicated that the question was currently being addressed in various projects. (Unfortunately, results from these projects were not available at the time of reporting.)

There were a number of responses commenting upon the speed and quality of telecommunications links outside the major metropolitan areas.

> The use of technology in the bush. Unfortunately the Testra network is not what it should be. It has poor connection speed and service faults are hardly ever fixed by technical staff.

Perhaps the most significant comments related to the issues surrounding basic equity in education. One respondent listed the following points that he/she saw reflected the current state (mid-2001):

- Language/literacy/comprehension skills with the written word has proved a barrier.
- Lack of technical/computer skills has proved a barrier.
- Lack of suitable/compatible computers or lack of computer capacity.

The following comments highlight another key area of concern:

- Online delivery does cater more for independent, self-motivated individuals.
- Students with high learning potential/gifted and talented have appreciated and benefitted from this technology.
- As teachers, so much time is allocated to students at risk so we tend to give disproportionate [that is, not enough] time to those that are 'coping'.

Some respondents, while not happy with the current online context expressed optimism for the future:

> Unfortunately, in the first instance, online courses will be utilised by the technology-rich sector of society. Eventually, I feel that online delivery will offer a more flexible access and equity situation to many more people.

One response may have been cynical:

> This is the best equity ever, student is unseen, all are treated the same.

While another respondent had obvious views:

> No. Useless question.

Observations on the communication process

The way in which resource developers communicate with the outside world is critical to the development of online delivery. In order to ascertain the quality of the communication process, the URLs provided by survey respondents were checked. It was not assumed that there would be open entry to a site, but it was assumed that some exploration could be carried out.

It was found that most sites could not be accessed beyond the opening, log-in screen. Few had a guest entry or an entry that allowed prospective students to sample the content. One site that actually had a demonstration of its offerings had no obvious way to make contact.

The important point here is that online educational programs should enable some degree of communication with prospective students. In our context, website owners appear not to have enabled potential students to sample what is being provided. This is not good advertising for the world of immediate information—the new horizon in educational delivery.

Marketing or simply letting things happen?

The competitive market for online materials is, at this stage, a very underdeveloped area, underdeveloped in the sense that everyone is trying to become involved but most people are having difficulty working out how to do it. If the VET sector wishes to tap into this market, then it must take account of some of the side issues this project has identified. For instance, we have noted above that there has been little or no attempt to market the online courses on offer—in terms of the provision of a user-friendly, accessible and informative website.

Another issue relates to the quality of the interfaces being generated on web pages. We have already noted a lack of any clear definition of best practice in online delivery. Marketability is tied to meeting world best practice.

An interesting point arising from the interviews concerns the range of difficulties people face in trying to define their target population for online delivery. The general argument that providers were now able to offer to students who would previously not have had access is not plausible. Traditional distance and flexible education is arguably more flexible than online delivery, and less expensive because it needs neither specialist technology nor potentially expensive internet service providers. Again, marketability assumes that you understand your target population.

Little focus on evaluation

Throughout the interviews, little reference was made to evaluation in the online arena. This may reflect the difficulties in defining the pedagogical models that underpin online education. However, if online learning is to be a significant part of future education, then evaluation will need to be given much greater consideration. The imperative for this is only partly based upon the perceived expense in developing and maintaining online materials—a cost–benefit issue.

Evaluation should also be placed within the commercial and globalisation framework. Institutes which view the commercial possibilities of online delivery without evaluation of the product and its

presentation are likely to find it difficult to build effective business models of online educational delivery.

Crucial to this issue is that of professional development. Staff need skills in cost-effective methods of evaluation of educational delivery and student responses to diverse educational media. This is a complex task and must be accomplished from a strong conceptual base.

Conclusion

The online education environment is a growing and influential area of education and, in an international arena, has the potential to provide a borderless model of education. If the Australian VET sector is to be a major player in that environment, then the sector must have the ability to perform at a level whereby it is educationally competitive.

The primary aim of this project was to investigate current usage and even here it was clear that current useage is not well-developed. The outcomes of the project can be considered as reflecting findings that focus upon the educational *here-and-now*—the information collected failed to reflect thinking about online and electronic educational delivery into the immediate future. Some of the interview and case-study data hinted at possibilities when a number of the respondents spoke of e-learning rather than online delivery. Others commented on the limiting effect of the current bandwidth on delivery practice. What did not appear was any coherent exploration of what lies around the corner. Yet the data in the report are from those who are working at the frontiers of this educational mode.

An issue relevant to the development of policy relating to online education in this sector, and its implementation, is that the virtual delivery culture does not appear to be well understood. Most interviewees and respondents appeared to be unaware of the possibilities of distributed computing and pervasive computing where information can be rapidly and readily delivered in ways yet to be fully operationalised. An example with potential educational importance is the hand-held phone–computer–reader, partly driven by Blue-tooth technology, which is able to tap into the internet in a wireless mode, a development which has been termed the 'hand-held classroom'.

If the VET sector is to make an impact in the general development of e-learning, rather than in online delivery, policy must be advanced which supports likely future scenarios, including pervasive, virtual delivery of learning materials.

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Appendices

Appendix 1

Consortium

Chisholm Institute of TAFE, Victoria

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Robin Tunbridge	Support project manager, Chisholm Institute
Graeme Young	Research analyst, Chisholm Institute
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Sue Lapham	West One, Western Australia
Mark Russell	Australian Council for Further Education

Advisory group

Nic Pearl	Australian National Training Authority
Andy Smith	National Centre for Vocational Education Research
Mike Brough	Department of Education, Tasmania
Paul Fairweather	National Centre for Vocational Education Research
Mark Russell	Australian Council for Further Education

Appendix 2

Initial contact and preliminary interview questions

Data were gathered through telephone contact with 85 TAFE institutes using the four questions below:

1 Can you tell me what you think online learning means?

2 Do you have any information related to online learning or delivery in your organisation, e.g. brochures, annual report, web address, that you would forward to me?

3 Please identify 5–10 people in your institute/college to whom we could send the survey. These people might be course developers, online teachers or deliverers of online learning, manager of online learning or Learnscope projects in your organisation.

4 Would you please forward me the details, e.g. emails, telephone numbers?

Appendix 3

Definitions

Key definitions located during this project are given below. They are organised to reflect an emphasis on online learning, online delivery or online education, and reflect the data-gathering from the literature, telephone contact and survey analysis.

Online learning:

- covers any use of computers and the internet to facilitate learning, including the use of internet in the classroom, to support distance-learning courses, or to support learning in specific topics. It is typically treated as a subset of some other category such as distance learning or educational technology (Stephen Downes, www.atl.ualberta.ca/downes/future/home.html)
- is a blend of three elements: instructional design of content, communicative learning activities, and appropriate support for learner. It is the ability of the teachers as designers to provide this rich mix of learning and to facilitate an active learning community that is the crux of quality online learning (Chalmers & Murray 2000)
- is becoming a shorthand way of describing learning that is supported by the information storage, retrieval and communication capacities of networked computers. This involves using the internet, usually via world wide web browsers such as Netscape or Microsoft's Internet Explorer (ANTA Toolbox Central website 1999, available at www.anta.gov.au/toolbox/)
- is structured in systems that mean educational structures that include a web-based technological infrastructure, online course material and online enrolment, tutoring, communication, assessment and administration procedures. Online learning systems often use complementary delivery methods, such as printed course materials (Mitchell 1999 cited in Booker 2000, p.5).
- is learning supplemented by the use of a PC. It might be communication—email, chat, bulletin boards downloading resources, class notes. It does not have to be a whole course. Alternatively, it could constitute a course accompanied by a tutor online.
- is when educational organisations provide online courses catering to student and industry needs. Students and teachers are provided with communication tools to enable them to interact with fellow students and teachers. An environment similar to a classroom is created. It is a tool for them to learn in and learn with, at a time and space that is convenient—freedom from time, space, schedules, integrated in home life and work life.
- is aligned with terms such as:
  - self-paced learning
  - providing a flexible approach to the learner's needs
  - an inclusive approach
  - teacher and learner proximity to, or distance from each other
  - technology as the primary vehicle for the transfer of information

- a learning environment that encourages student interaction and engagement
- interaction with others via computer by a visual process like video, pictures or words
- good facilitation and leadership
- does not work for people with literacy problems or those people with English as a second language, particularly emails, chat lines and bulletin board that are essentially print-based.
- use of online technology in delivering education to students
- knowledge generation and/or construction involving internet-based content and/or collaborative tools.

Online delivery:

- means accessing learning material on the internet, using computer simulations, and being supported by computer-mediated communication (Moffatt 1997, p.325).
- provides enterprises and individuals with access to just-in-time training from the workplace, home or community centre, as well as from TAFE campuses. The online course provides learning, materials and guidance through the course of study from a lecturer or tutors who will communicate with students through email and online discussion groups and, if necessary through other forms of communication such as videoconferencing and the telephone (TAFE SA online publicity brochure).

Online education:

- represents a unique domain of educational interaction. It shares attributes with both face-to-face and distance education, but the nature of the medium is distinct in its implications for education (Harasim et al. 1996 cited in Booker (2000, p.5).

Statements used in survey

The following statements about online learning were used in the survey:

- Online delivery enables freedom from time and schedule constraints and lets students integrate their learning into home or work life.
- Online delivery is working from a CD-ROM either at home or in the classroom.
- Online delivery means doing a course at your convenience using technology and support.
- Online delivery is provided by colleges to cater to industry and student needs.
- Online delivery is using technology as a resource either remotely from a distance or within a classroom.
- Online delivery is a subset of flexible delivery and distance education.
- Online delivery provides teachers and students with communication tools to help them interact with fellow students and teachers.
- Online delivery means teachers become tutors rather than deliverers of a course.
- Online delivery is using the world wide web to study the content of a course, carry out activities and submit these activities for assessment.
- Online delivery is learning conducted and supported online through internet technologies and/or CD-ROM/hard disk drive medium.
- Online delivery uses information technology and communication facilities to allow students to undertake self-directed learning.
- Online delivery is learning over the internet, instead of a traditional face-to-face environment, in a facilitated and collaborative environment.
- Online delivery provides materials as support only and does not provide a real learning environment.

Appendix 4

Interviews with course developers identified as using online learning

Interviews were condusted with selected course developers in training organisations (drawn from networks of the project team in Western Australia, New South Wales and Victoria, and National Learnscope Manager), and personnel in the following organisations/bodies:

- Open Training and Education Network, New South Wales
- Learning Technology Branch, Post-compulsory Education, Training and Employment Office, Victoria
- Online Network, South Australia
- TAFE Tasmania Online
- Open Learning Network and Institute, Queensland
- WestOne, Western Australia
- Representatives of the Australian Council for Further Education (ACFE) sector via associate team member Tim Smith.
- A small number of major private providers via Australian Council of Private Education and Training (ACPET) associate team member Mark Russell.

Appendix 5
Online delivery survey

This project is a key section of a larger study being funded by NCVER, and is designed to build a comprehensive picture of online delivery in the VET sector.

Our task is to find out from you and your colleagues how you interpret **online delivery** and how this is impacting on the way courses are being developed in your industry area. For details you can go to http://wombat.chisholm.vic.edu.au/ncver

The survey is *anonymous*. You are not being asked to identify yourself (although this is an option). The information we collect on subject/course and provider details will be summarised and presented to show the extent of online delivery at a state and national level. No individual respondent will be identified nor will we publish material in a form where you could be identified.

If you wish to clarify any points about the survey please contact either:

Selby Markham 03 9903 6620 **Selby.markham@csse.monash.edu.au** *Or*	Graeme Young Research Analyst PO Box 1281 FRANKSTON. Vic. 3199 Phone: 03 9238 8331 G.Young@chisholm.vic.edu.au

Returning the survey

1. A reply-paid envelope is provided for you to return survey once you have completed it.
2. It can also be returned by fax to **03 9781 4971**.
3. This survey must be returned to Graeme Young by:

   FRIDAY 25 MAY 2001.

Doing the survey

The survey should take between **15 and 20 minutes to complete. *The items have various formats*:**

Where you are being asked to indicate an option on a scale, could you ***circle your choice***?

For check boxes, either place a tick or cross in the box(s).

N.B. A **DK/NA option** (*Don't Know/Not Applicable*) is given for most questions.

Try to use this *only when you clearly cannot answer the question*.

If you wish to add comments or information, feel free to write on the back of the final page of the survey or to attach documents to the survey.

Online delivery survey

Section 1 Biographical

This survey is intended for staff who have been working with on-line subjects, over this and/or the previous semester, as either a subject developer or deliverer. If you *do not fit this description* could you please pass the material on to a staff member who does fit the description.

1.1 Name (OPTIONAL)

1.2 Position title

1.3 Length of time in development or delivery activities in on-line area.

<1 years	☐ 1
1–2	☐ 2
2 +	☐ 3

1.4 **Teaching/delivery field of study, or area of expertise**

Land and Marine Resources, Animal Husbandry	☐ 1
Architecture, Building	☐ 2
Arts, Humanities and Social Science	☐ 3
Business, Administration, Economics	☐ 4
Education	☐ 5
Engineering, Automotive, Surveying	☐ 6
Health, Community Services	☐ 7
Law, Legal Studies	☐ 8
Science	☐ 9
Veterinary Science, Animal Care	☐ 10
Services, Hospitality, Transportation	☐ 11
TAFE Multi-Field Education	☐ 12
Information & Communication Technology	☐ 13
Other ☐	☐ 14

1.5 Highest qualification achieved

Trade qualifications	☐ 1
Professional exams	☐ 2
Certificate	☐ 3
Diploma	☐ 4
Pass/Honours Degree	☐ 5
Masters	☐ 6
Doctorate	☐ 7
Other	☐ 8

1.6 What is your role in responding to this survey

Subject deliverer	☐ 1
Subject developer	☐ 2
Both deliverer & developer	☐ 3
On-line manager/co-ordinator	☐ 4

1.7 Gender (Optional)

Male	☐ 1
Female	☐ 2

1.8 Age (Optional)

	☐ 1
18–24	☐ 2
25–34	☐ 3
35–49	☐ 4
50–59	☐ 5
60–69	☐ 6

1.9 Institute/college ☐

1.10 State & location

ACT	☐ 1
NSW	☐ 2
Northern Territory	☐ 3
Queensland	☐ 4
South Australia	☐ 5
Tasmania	☐ 6
Western Australia	☐ 7
Victoria	☐ 8

Please indicate the regional base of your organisation

Capital city	☐ 1
Regional city	☐ 2
Country area	☐ 3

Section 2 Your understanding of online delivery

What does the term online delivery mean to you?

Please rate the following statements as to how well they compare with your thinking, using the following 5-point scale.

Circle the point on the scale to show **how close** the definition is to your thinking. The ***Don't Know*** **(DK)** should be used only when you cannot understand or place the statement.

	Very close to my thinking				**Very distant from my thinking**	
Online delivery enables freedom from time and schedule constraints and lets students integrate their learning into home or work life.	1	2	3	4	5	DK
Online delivery is working off a CD-ROM disk either at home or in the classroom.	1	2	3	4	5	DK
Online delivery means doing a course at your convenience using technology and support.	1	2	3	4	5	DK
Online delivery is provided by colleges to cater to industry and student needs.	1	2	3	4	5	DK
Online delivery is using technology as a resource either remotely from a distance or within a classroom.	1	2	3	4	5	DK
Online delivery is a subset of flexible delivery and distance education.	1	2	3	4	5	DK
Online delivery provides teachers and students with communication tools to help them interact with fellow students and teachers.	1	2	3	4	5	DK
Online delivery means teachers become tutors rather than deliverers of a course.	1	2	3	4	5	DK
Online delivery is using the World Wide Web to study the content of a course, carry out activities and submit these activities for assessment.	1	2	3	4	5	DK
Online delivery is learning conducted and supported online through internet technologies and/or CD-ROM/Hard Disk Drive medium.	1	2	3	4	5	DK
Online delivery uses information technology and communication facilities to allow students to undertake self-directed learning.	1	2	3	4	5	DK
Online delivery is learning over the internet, instead of traditional face-to-face environment, in a facilitated and collaborative environment.	1	2	3	4	5	DK
Online delivery provides materials as support only and does not provide a real learning environment.	1	2	3	4	5	DK

Section 3 Online subject and course information

The following sections will be about a subject, module or unit of a course. We will use the term ***subject*** *to cover all possible cases.*

Please answer the following in terms of *one subject, that has an online component,* you are involved with this semester, or you were involved with in the previous semester. Preferably, use the course with which you have been most recently involved.

3.1 What is the name of the *online subject* and its code?

Subject Code

Subject Name

3.2 What is the *course code* and *name for this course*?

Course Code

Course Name

3.3 ***To assist with the analysis of the data can you supply some supplementary information about the subject or course*****?**
This can take the form of a course outline, subject outline or a web address which contains this level of detail.
Could you include this with your survey form.

3.4 Could you give us the URL (if there is one) for the subject or the course:

http://

Section 4 Online delivery of subject

How would you characterise the modes of the delivery for the subject described above:

(Please **circle one of the percentage points** which have been placed on the scale **OR use the NA/DK** for Not Applicable or Don't Know)

4.1	The percentage which is delivered online	0%	25	50	75	100%	NA/DK
4.2	The percentage of the subject which involves classroom contact	0%	25	50	75	100%	NA/DK
4.3	The percentage of the subject which involves workshop/laboratory/fieldwork contact	0%	25	50	75	100%	NA/DK

What is the delivery mix for this subject?

4.4	Interactive material on the Web (material which requires student action, modification, involvement)	0%	25	50	75	100%	NA/DK
4.5	Static material on the Web (material which is intended to be downloaded)	0%	25	50	75	100%	NA/DK
4.6	CD ROM for local computer	0%	25	50	75	100%	NA/DK
4.7	DVD for local computer	0%	25	50	75	100%	NA/DK
4.8	Locally installed on a computer, server or network rather than being on an Intranet or the Internet	0%	25	50	75	100%	NA/DK

What percentage of the following components of the subject are delivered on-line?

4.9	Pre-enrolment information for the subject	0%	25	50	75	100%	NA/DK
4.10	Subject handbook/study guide materials for day-to-day operation	0%	25	50	75	100%	NA/DK
4.11	Class notes/handouts	0%	25	50	75	100%	NA/DK
4.12	Formal assessment tasks	0%	25	50	75	100%	NA/DK
4.13	Self-assessment tasks	0%	25	50	75	100%	NA/DK
4.14	Other teaching materials and resources	0%	25	50	75	100%	NA/DK

What methods are available to students to respond, reply or communicate?

		Yes	**No**
4.15	e-mail	1	2
4.16	News groups / Bulletin boards	1	2
4.17	Chat rooms	1	2
4.18	Online assignment/portfolio submission	1	2

Please consider this subject against another similar subject which is not delivered on-line.
We have designated this as *On-line* versus *Conventional* for the following questions.
Can you compare the two when answering this section.

		Less than conventional	No difference	Greater than conventional	
4.19	Hours you allocate for student contact	1	2	3	DK/NA
4.20	Hours needed for subject management	1	2	3	DK/NA
4.21	Time needed to develop the online materials	1	2	3	DK/NA
4.22	Time needed to maintain the online materials	1	2	3	DK/NA
4.23	Ability to easily update teaching materials	1	2	3	DK/NA
4.24	Relevance of subject material to student needs	1	2	3	DK/NA
4.25	Overall time involved in teaching the course (contact, preparation, assessment)	1	2	3	DK/NA
4.26	Relevance of content to student learning outcomes	1	2	3	DK/NA

4.27 Who did the content development for this on-line subject?
(You may tick more than one box)

You	☐ 1
A group in your teaching unit	☐ 2
College-based courseware development group	☐ 3
External courseware development group	☐ 4
Don't Know/Not Sure	☐ 5

Section 5 The following questions look at some general issues regarding online delivery. If you feel you do not have the knowledge or expertise to answer, you need not respond.

		Typical of general intake				Very different	
5.1	What are the characteristics of the students enrolling in this subjects in relation to the overall VET client base?	1	2	3	4	5	DK/NA
5.2	What do the age characteristics look like?	1	2	3	4	5	DK/NA
5.3	And the gender distribution?	1	2	3	4	5	DK/NA

5.4 If the use of on-line delivery has changed the type of student you are getting, what type of changes have you seen?

How is your organisation supporting on-line delivery?

		High				None	
5.5	The level of technical support (software design/access to computers/etc.) I obtained when developing this course.	1	2	3	4	5	DK/NA
5.6	The level of educational support I obtained when developing this course	1	2	3	4	5	DK/NA
5.7	The level of support in resources (equipment, etc.) I obtained when developing this course	1	2	3	4	5	DK/NA
5.8	The level of support I have had to deliver online learning	1	2	3	4	5	DK/NA

5.9 Can you identify any further opportunities for on-line delivery in your specific subject or broad industry area?

5.10 One of the issues of concern to the project is the impact of on-line delivery on equity in education.

Do you have any information we might access which is related to access and equity issues in on-line delivery?

Could you please point us to any such information?

Thank you for completing the survey.

Summary results will be published on the project Website - its URL is on the cover page.

Could you please indicate the time it has taken by you to complete this survey:

Minutes

Appendix 6

Semi-structured interviews with sample of providers who responded to the survey

Instructions to interviewers

These instructions are designed for use by the members of the project team: 'Researching Online Usage in the VET Sector'.

Each person interviewing on behalf of the team (either at Chisholm or West Coast) is asked to use these questions to achieve a consistent approach to gathering the data for selection of our case-study sites.

1. The enclosed interview schedule is based on the 6 main headings. The sub-headings are designed as prompts if these broad areas are not covered by the interviewee.
   Try to encourage the interviewee to respond in his/her own terms and only deal with the prompt points if they are not covered.

2. The 6 topic areas do not have to be covered in the order presented except for the first question, which is the general stimulus.
   If, for example, the interviewee covers question 5 sometime early in the interview, do not repeat the question later.

3. Suggested opening:

   My name is …….. from the NCVER project: *Researching Online Learning Usage in the VET Sector*. You responded to our survey and said that a follow-up contact would be OK. This follow-up is an extended interview to help us fill out our information on online learning.

   The material I would like to cover is based on 6 broad questions **(interviewer quickly refers to the main part of each question).**

   Would you like time to think about them and I will ring you back later? Or do you think we could do the interview now? It should take no more than 15 minutes.

   These questions are **additional to** the information we have gathered from your response to the project survey that you responded to a few months ago. Can we clarify a couple of points?

   The subject/module is:……..

   You were : deliverer/developer/both

We believe that it would be valuable to explore the work that you are doing in online delivery or development, and may wish to build your 'story' in to one of five case studies for the project (if that meets with your director's approval).

I will be taking notes while you talk, and will be happy to provide them for your records.

At the end:

Thank you for your help. If we wish to contact you to include you in a case study, would that be OK? A case study will involve collecting more detailed data. We will want to explore practical and educational questions in more detail. We will also want to look at the way online learning initiatives are implemented in your institute/college and state. Summary information, on all aspects of the project, will be available on the project website.

Questions

4. Can you describe the resource base from which your online offerings (modules/units) were developed?
    a. Was there specific funding for it?
    b. Did you buy in the materials?
    c. Did you share the development with another organisation?

5. Where did the ideas for implementing this online program come from?
    a. Was it an educational decision?
    b. Did they come from networking with others in the TAFE system, or elsewhere?
    c. Were they driven by organisational imperatives

6. What was/is your own, or your unit's motivation to deliver programs online?
    a. Is it driven by the institute, and built into the strategic directions of the organisation or the corporate plan?
    b. Have the online programs been developed mainly as a commercial opportunity?
    c. Has the development and delivery been driven mainly in order to meet the needs of students? If so, would you describe the student needs that are met using this model of delivery?

7. What are you trying to achieve in your online delivery?
    a. Clear educational outcomes? Developing educational processes and thinking?
    b. What are the institute/college goals in this area in the next 5–10 years?
    c. Does this include promoting greater uptake? If so, how would you wish to promote greater uptake of online learning by students?

8. What can you tell me about the technical aspects of developing and delivering your online courses/modules?
    a. What platform are you using (e.g. VETTWEBB, WebCT, TAFE VC, Blackboard, other)?
    b. What software do you use to develop or deliver your programs?

        ✧ **Authoring (programming):** Microsoft Frontpage or Word (and save as HTML), Macromedia Dreamweaver/coursebuilder, other HTML editor

        ✧ **Graphics/animation:** Macromedia Flash, Fireworks-Adobe Photoshop, Corel Draw, Other graphics/animation software

- ✧ Communications/email: Groupwise, MS Outlook, other
- ✧ Communication/Threaded discussion group
- ✧ (separate from platform facility): Allaire Forums, O'Reilly's WEBBoard, Allaire Forums, other.

9. Do you operate using both the internet and your own organisation's intranet?

Appendix 7

State-based interviews

1. What modules are delivered in this state online?
2. What institutes/registered training organisations are delivering the modules?
3. What modules is each institute delivering?
4. Which modules:
   - ✧ are delivered totally online
   - ✧ are supplemented with another mode of learning delivery/resource?
5. How many students are involved in your state in studying:
   - ✧ totally online
   - ✧ partly online
6. Is it possible to align the 'TAFE VC' (or relevant state 'platform') modules with accredited programs/courses and recognised qualifications, that is: AQF 2–5?
7. Which modules on the 'TAFE VC' (or relevant state 'platform') equate to:
   - ✧ learning modules/units of course-based curriculum
   - ✧ units/elements of competence in training packages?
8. What is the total online offering in line with industry/occupational groupings?
   - ✧ Agriculture, forestry and fishing
   - ✧ Mining
   - ✧ Manufacturing
   - ✧ Electricity, gas and water supply
   - ✧ Construction
   - ✧ Wholesale trade
   - ✧ Retail trade
   - ✧ Accommodation, cafés and restaurants
   - ✧ Transport and storage
   - ✧ Communication services
   - ✧ Finance and insurance
   - ✧ Property and business
   - ✧ Government administration and defence
   - ✧ Education
   - ✧ Health and community services
   - ✧ Personal and other services.

Table 10: Summary of online usage in the VET sector

		Extent of online usage					
		NSW	VIC	SA	TAS	QLD	WA
Online modules delivered		80	170	231	36	120	72
RTOs delivering modules		12 RTOs (42 camp)	18	10	All (1)	12	14
Total modules delivered		784	196	228	36	69	331
Modules delivered	Totally online	80% can 40% do[a]	74	~70%	35	>50%	331
	Mixed	20% must, 60% do[a]	131	~30%	1	<50%	Unavailable[e]
Students involved	Totally online	Unavailable	Unavailable[b]	2000	320	3000	1067
	Mixed	Unavailable	Unavailable[b]	2300	Unavailable	~3000	Unavailable
Alignment with AQF 2-5		100%	96.5% (164 of 170)	95%	100%	92%	100%
Module focus	Course-based	100%	all are either	100%	48.7% (15)	Unavailable	100%
	Competency-based	~80%	all are either	20%	51.3% (21)	100%	100%
Industry/ occupational groupings	Agr, forestry and fishing	49	29		Indeterminate[c]	14	Presented[f] separately
	Mining	9	0		Indeterminate[c]	0	(see figure 3)
	Manufacture	7	6	Information	Indeterminate[c]	6	
	Elec, gas, water	0	0	unavailable	Indeterminate[c]	1	
	Construction	20	5	at this	Units offered[d]	0	
	Wholesale trade	0	0	time	Indeterminate[c]	0	
	Retail trade	0	6		Indeterminate[c]	40	
	Accom, cafes, restaurants	30	18		8[d]	10	
	Transport and storage	23	0		Indeterminate[c]	6	
	Communication services	62	7		Indeterminate[c]	39	
	Finance and insurance	12	20		Indeterminate[c]	0	
	Property and business	77	1		Units offered[d]	76	
	Gov. admin. and defence	8	0		Indeterminate[c]	26	
	Education	24	42		Indeterminate[c]	11	
	Health, community service	38	33		Indeterminate[c]	7	
	Personal and other services	18	0		Units offered[d]	5	

Notes:

a While 80% of units can be delivered fully online in practice, approximately 50% of lecturers opt to start courses in mixed mode or to incorporate some mixed content within the course.

b Information indicates that a total of 10 300 users are registered with WebCT but exact numbers are uncertain and their online status is unknown.

c Many units offered apply skills relevant across many industry/occupational groupings. As such an indication of number would not accurately reflect the options valuable.

d While some units are available specifically for this industry/occupational group, other units on offer to students may also be relevant.

e 14 of the 15 on line providers also offer mixed modules for a wide range of subjects.

f Data from WA reflects the modules as per ANTA grouping and only close modules are listed where students have enrolled.

Appendix 8

Online initiatives in Australia

- The University of Southern Queensland (USQ) has become an early adoptor of online education and training, and offers 24 award courses online through USQ *Online* (http://www.usqonline.com.au), including a Master of Online Education (Taylor et al. 2000).
- TAFE in South Australia offers approximately 200 modules with some online component, including six certificate IIIs and IVs which are available completely online. The relevant institute offers both face-to-face and online options along with courses where both the options are integrated. Most of their online enrolments have come from their existing students, who have moved to online courses or mixed mode of delivery.
- TAFE Virtual Campus in Victoria is offering fully online subjects to the students and has been designed to make online tools available to teachers across the state. TAFE Queensland has developed two delivery options and one of these provides a completely online procedure from enrolment to completion.
- Online options are available for approximately 30 government-funded and fee-for-service modules. Canberra Institute of Technology has developed a training program for the QANTAS staff and developed modules for in-house training. WebCT training and consultancy services are now provided by TAFE in South Australia to Australian and overseas institutions.
- NSW TAFE online http://www.tafensw.edu.au. The purpose of this project is to create an online learning environment, develop infrastructure and resources, and support teacher and student interaction.
- TAFE Virtual Campus http://www.tafevc.com/ is an online learning platform that supports a complete learning environment for the management and delivery of training.
- ACENET http://home.vicnet.net.au/~acenet/ It is one of the ten learning networks established by the Office of Post-compulsory Education, Training and Employment (PETE). It aims to enhance access to vocational education and training amongst specific target groups throughout regional and metropolitan Victoria.
- TAFE Online Queensland http://www.tafe.net/ offers a variety of online programs across communities in Australia and the world.
- OTEN-DE IT Virtual Campus http://www.oten.edu.au/oten/ is a major New South Wales initiative in online learning in VET sector.
- Queensland Open Learning Network http://www.qoln.net/ intends to upgrade its 40 learning centres located in rural, regional and remote areas of the state.
- TAFE South Australia online http://www.tafe.sa.edu.au/
- Learnscope National Project http://www.learnscope.anta.gov.au/ is designed to assist registered training organisations to use innovative and flexible delivery approaches.

- WestOne http://www.westone.wa.gov.au/ was initiated to enhance VET through the use of digital technologies in Western Australia.
- VETTWeb http://www.vettWeb.net.au/ is a global internet campus to offer a world of new educational opportunities for people involved in training from students to private companies and training providers.
- The Learning Media Services, TAFE Tasmania, Hobart, is set with the mission to design, develop and implement flexible learning resources and systems through a variety of media, to improve and enhance teaching and learning regardless of a students' location or isolation and taking into account differing learning styles and capabilities. A total of 1153 students enrolled in the flexible delivery programs in 11 program areas.
- Southern Sydney Institute (SSI) in NSW is developing online learning resources involving the institute staff. The institute joined the TAFE NSW Online Learningware project and developed a range of modules in partnership with Riverina Institute. These will be piloted and released within TAFE NSW in 2001 (Kerry 2000)
- Tropical North Queensland Institute of TAFE (TNQIT), a nine-campus network, has commercialised a video-streaming package. The package extends the potential for students to study TNQIT courses from other places and overseas. Video steaming is a combination of traditional teaching method with internet technology, and the major benefit of the medium is that the off-campus students can see other participants in the classroom (Gill 2000).
- ANTA Toolboxes http://www.anta.gov.au/toolbox/ have been developed through the Australian National Training Authority to support online delivery of qualifications from recognised training packages. The first series of Toolboxes was piloted in 1998 and a fifth series is currently under development.

Appendix 9

ANTA group	ANTA group description
01	Arts, Recreation, Entertainment Workers
02	Automotive Workers and Salespersons
03	Building Trades and Construction Workers
04	Community Service, Health and Education Workers
05	Finance, Insurance, Property Service Workers
06	Food Processing Workers
07	Textile, Footwear and Clothing Trades and Associated
08	Communications including Printing Workers
09	Engineering and Mining
10	Farmers, Animal Husbandry, Fisheries, Horticultural
11	Chemical Production
12	Salespersons and Personal Service
13	Hospitality, Travel and Tourism
14	Transport Trades, Storage and Associated
15	Gas, Water and Electrical
16	Business and Clerical
17	Computing
18	Science and Technical
19	General VET/LOTE

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