Three years down the track: what has worked; what hasn't —a review of a 100% online delivery program in TAFE NSW

Greg Webb & Julie Gibson
Open Training and Education Network, TAFE NSW

ABSTRACT

The information Technology teaching section at OTEN has been running an online delivery program for three years. It has chalked up a considerable number of successes but there have been some important lessons to learn.

This paper covers the background of the development of the 400-hour Certificate Level 4 course with an outline of the pedagogy and the educational outcomes.

Topic area: Flexible delivery approaches
Keywords: Online delivery, methods, tools

INTRODUCTION

Four years ago the Information Technology teaching section at OTEN [URL-1] started delivering a TAFE certificate in PC Support via the World Wide Web. The delivery model adopted was completely different from the established OTEN methods, it was designed to make use of the opportunities the Web offers for extensive communication and interactions between participants.

The certificate is the Certificate Level 4 in Information Technology (PC Support), course number 3602. It is a 400-hour nominal duration course consisting of 13 modules. The vocational outcome of a student completing this course is to work as a PC support officer or help desk operator in a medium to large sized organisation.

At this stage we are ready to make some informed reflections on what has worked and what we would change next time.

BACKGROUND

In 1999 there were more than 3000 students enrolled in IT courses at OTEN. The IT section uses the established OTEN delivery systems for the majority of these courses. The delivery of the Certificate in PC Support is different not only because all modules are offered via the Web, but also in its underlying pedagogy.

The usual OTEN model allows students to set their own schedule and to choose the order in which they study their modules. A student completes modules before starting new ones. The teachers provide support mainly in a reactive way when contacted by the student for a purpose. A significant part of the costs are involved in the development of the learning materials so that the more students the better the economy of delivery.

In spite of this additional flexibility for the student the OTEN methodology is in fact a very efficient model where costs are kept to half of those for college delivery, even including the high costs of development of materials. With the Web we have been able to return somewhat to the use of active teaching in the sense discussed by Fitzgerald (1999) in the article "Toward a model of distributed learning". In this article he discusses the evolution of education from the crafted and active "Oxbridge" model into the large scale and more passive lecture/exam style.

Online teaching the PC Support Certificate

The exciting thing about the Internet is the way in which it can be used for communicating between people, it is just as easy to send a message to a whole group as it is to send it to an individual. It allows the teachers to become an active motivating component in a student's learning process.

We delivered a single module using the WWW in 1996 and we examined closely what that group of students liked best about this method of study. What they liked best was the ability to communicate quickly and easily with us, both for learning the content and for sorting out administrative issues. They also loved being able to find out about the other students studying the same module and communicating informally with each other (Gibson 1997).

The following year when we offered a complete course we made sure that we preserved these aspects in our delivery style. We emphasised the human interactions and minimised the use of sophisticated multi media. Multi media would have limited which students could access our resources because of the limitations of telecommunications at the time. Because of ensuring that our lines of communication were well established we were able to take some risks with our delivery materials. They were often developed "just in time" to be released to the students and we depended on the students themselves carrying out the final review process because the teachers were able to quickly correct any errors or omissions.

The course is now in its fourth year as a 100 per cent online delivery. It has been very successful in its measurable outcomes and the levels of student satisfaction. The only reason it will be withdrawn in 2001 is because of changing curriculum offerings. In 1998 one of the online students won the TAFE NSW State medal for the course against many students studying in college classroom environments.

Outcomes

A comprehensive analysis of the outcomes of the course was presented at ODLAA (Webb & Cilesio 1999a). Tables 1, 2 and 3 are updated tables to include the 1999 - 2000 data.

Table 1: Working rates 1998-1999

	Working Rates
1998	88%
1999	89%

Table 2: Module completion rates 1997-1999

	Module Enrolments	Modules Completed	Module Completion Rate
1997	164	65	40%
1998	472	292	62%
1999	660	472	72%

Table 3: Course completion rates 1997-1999

	Enrolments *	Withdrawals	Completed in first 12 months		Completed to date		Re-enrolled in 2001
			n	%	n	%	
1997	23	17	5	22%	6	26%	run out
1998	50	33	11	22%	14	28%	3
1999	64	22	30	47%	30	47%	12
2000	56	-	-	-	-	-	-

*Adjusted for withdrawals in first 10 days

In the third year (Table 3), you can see the extraordinary jump in course completions in the first 12 months. This is in a large part due to the pro-active teaching style which was developed and refined by the third year.

2

THE TOOLS WE USED

The server

The technical base of our online delivery is a Netscape Enterprise web server and Informix back-end database running on a dedicated NT server with a permanent connection to the Internet, and a collection of HTML pages and LiveWire scripts. All the HTML pages conform to a site template with consistent navigation clues. Collectively it is called the OTEN InfoTech Virtual Campus (<http://vc.tafensw.edu.au>).

Figure 1: Home page of the OTEN InfoTech Virtual Campus
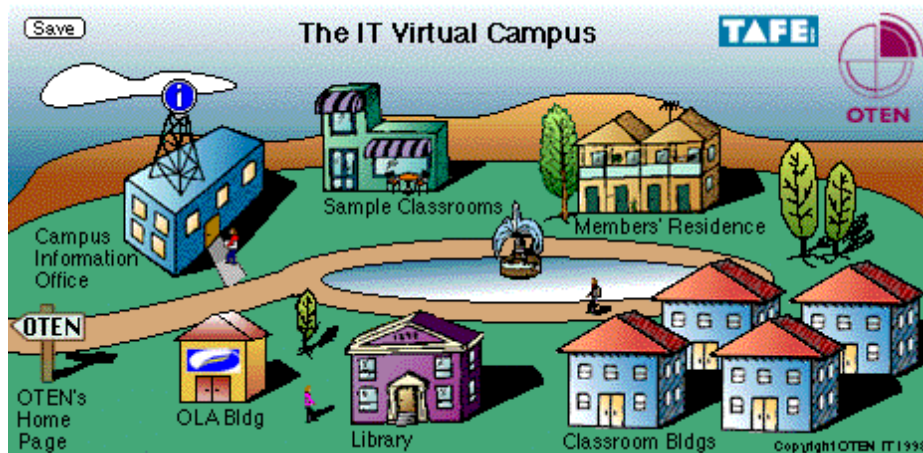
Provision of Information

The metaphor used for the web site is a "virtual campus". The campus comprises a number of buildings which contain different categories of information. For example, course information is in the Campus Information Office and student contact details are in the Members Residence. Learning materials are in the Classrooms Buildings area of the campus.

Figure 2: Clicking on the door opens up the classroom where all the learning resources are found.

The classroom areas of the virtual campus are only accessible by students and members of staff. This is controlled by the Netscape Enterprise Web Server which asks for username and password. The virtual campus metaphor works very well as it allows students to guess where information is located based on prior experiences at school and TAFE colleges. It also provides a template so that all classrooms are structured the same and therefore provides consistency in navigation.
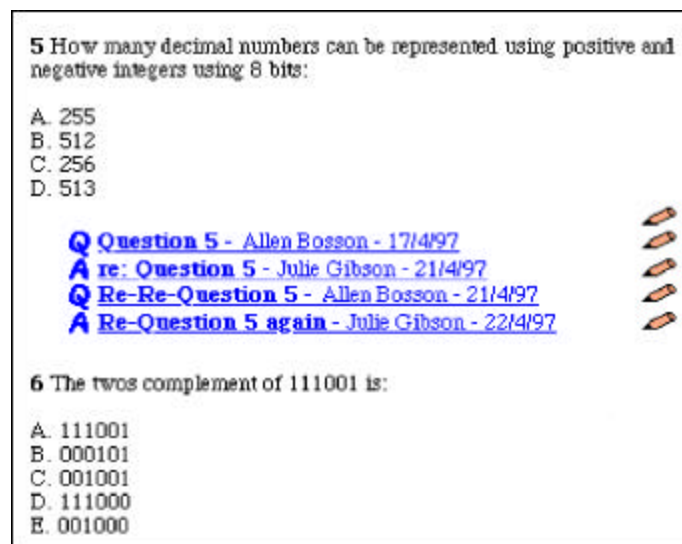
Annotations

Annotations is a system developed at OTEN for use on the Virtual Campus. It provides three main functions.

1. It permits students to interact with the teacher and other learners by adding comments to a page (Figure 3). This is particularly powerful when used on learning material pages as it simulates face-to-face classroom interactions. A student can post a question to a page, all students see the question and then the teacher can post a response and again all students see the response. Hearing others ask questions and hearing the teachers answers is a very important learning strategy for many learners.

2. It provides a mechanism by which teachers can add and update their pages on the site without being physically present at a TAFE campus and ensures that pages have a familiar look and consistent navigation.

3. Because the annotation system stores all the students email addresses teachers and students can communicate with the whole class by sending an annotation, with no need to keep email addresses up to date.

Figure 3: How annotations appear on a web page.

The user must click on the links to see the questions and answers. The pencil icon is used to add annotations.


```
5 How many decimal numbers can be represented using positive and
negative integers using 8 bits:

A. 255
B. 512
C. 256
D. 513

Q Question 5 - Allen Bosson - 17/4/97          ✎
A re: Question 5 - Julie Gibson - 21/4/97      ✎
Q Re-Re-Question 5 - Allen Bosson - 21/4/97    ✎
A Re-Question 5 again - Julie Gibson - 22/4/97 ✎

6 The twos complement of 111001 is:

A. 111001
B. 000101
C. 001001
D. 111000
E. 001000
```

Other communication technologies

We use e-mail, text-based synchronous and asynchronous conferencing, Annotations and listserver distribution lists.

The e-mail server software is Netscape Mail Server 2.02. It runs on the main server system. All students are provided with an e-mail address in the 'vc.tafensw.edu.au' domain. These addresses are aliases to the students' real addresses and it is up to the students to keep their email address up to date.

The Virtual Campus links into a WebBoard [URL-3] which is customised for the use of our students. This is used for both asynchronous discussions within subjects and Chat sessions.

Assessment system

We provide no automated online assessment, all assessment items are sent to a teacher and commented on to provide feedback for the student to assist in improving and developing their skills. The materials contain text-based activities to allow the student to carry out self-assessment tasks.

We have nothing against on-line formative assessment but did not see it as important as making use of the Internet to foster increased levels of communication between the people. So our resources were directed away from developing on-line assessments.

Some assessments, particularly assignments are present on the Virtual Campus as HTML pages and can be opened and printed at any time. Tests on the other hand are only made available when the

student is ready to do the test. In addition, tests must be completed within a specified time. A supervisor must be present and sign a slip to establish this.

The assessment system issues a test to a student when requested as long as the requirements are met. When the student clicks on the link, their identity, the details about the test and the time at which it was requested are noted in the database. When the student has finished the test, she sends it back to a system e-mail address as an attachment. The system notes the time the e-mail is received and therefore the teacher will know how long the student had the test. In addition, the teacher, found from the database, will be notified that the student has returned their test and the student is sent an acknowledgment that the test paper has been received.

Teachers can publish student results as a web page in the Assessment area of their classroom, but this must be hand crafted since the system is not set up for this.

Weekly Roll Call

Students make contact on a weekly basis by registering a weekly roll call message. We use an Internet survey program called EForm [URL-4] to send the students a message to which they can reply. The returned messages are added to an Access database and an updated HTML page is published on the web site using the new information. We also create a roll call page for the whole term based on the weekly data.

WHAT WE DID WITH THE TOOLS

"Computers alone cannot educate anyone" (Holmes 1999) And neither will the Internet, it's the people using these tools and how they do it that really counts. In a college the classroom provides an environment for learning, bringing teacher and learners together. The interactions between teachers and learners motivate and promote much of the learning. The classroom itself is just a place, as is the online environment. The tools listed above are just that, like the whiteboard or the overhead projector in a classroom, they are only of use when there are people actively using them.

The WWW allows us to make resources available to students that previously were only available by attendance at a college, but these resources are passive information until they are transformed into knowledge and then to learning (Fitzgerald, 1999) by the activities of the students and teachers. So how we make use of these tools is going to be what makes or breaks the project.

Learner Profile

Our students are made up of equal numbers of male and female, mostly aged between 30 and 40 years, and generally employed full-time. A majority live in metropolitan Sydney and all want to get a position involving PC Support. Their reasons for choosing to study online at OTEN vary but are basically due to being unable to attend a normal college program. Reasons include:

- Busy full-time job or life
- Geography and distance (Norfolk Island, far north, south and west NSW)
- Local college not offering this course
- Disability which prevents college attendance

Module Teaching

The methods for teaching the individual modules is as follows:

Modules are timetabled to have learner support

Modules are offered at scheduled times so that a student completing all modules on time will be able to complete the course in a set time. This allows us to schedule practical workshops and also allows us to provide learner support for the time that a module is offered. This is similar to the way that most universities offer their distance education programs.

Learner support takes the form of an online teacher pro-actively working with the students by setting weekly goals, motivating the group and individuals, enhancing weekly learning tasks with topical additional material and dealing with module administrative matters.

Students are encouraged to stick to the study timetable. If a student falls behind then they can work at their own pace and complete the module at a later time but we cannot guarantee learner support outside timetabled period because of the cost of making teachers available in this way.

Learners that want to work ahead of the timetable can commence modules with no guaranteed learner support. Continuing students can either wait and study modules with a timetabled class or choose to study without learner support.

Resources

Learning materials have been instructionally designed to be suitable for self-paced learning. They are placed on the web site, but students can choose whether they want to print them and study offline or use a downloaded version offline or study online. The visual design of the web pages is such that the printed version is comfortable to read. In a paper by O'Hara and Sellen (1997) on the comparison of reading materials on paper and online, the authors concluded, "paper still continues to be the preferred medium for much of our reading activity." It was our early experience that students would print the materials rather than read them online. We used to assume that this was just an established habit but the work by O'Hara and Sellen has shown that there are many practical advantages to be had by reading text on paper which are missing from screen. Not least of these is the ability to utilise many senses at once to keep track of place and prepare for moving on.

Due to constraints of time and money we have not developed more specialised resources which can make use of the multi media possibilities of online learning. Also our priorities place human communications ahead of interesting but isolated interactions with the machine. Whenever possible teachers have directed students to make use of resources already available on the Web.

Practical workshops are provided where students had to travel to Sydney to carry out both some practical learning tasks and the assessments involving hands on skills with PCs.

Assessment

In the online environment we have, on the whole, adhered to the OTEN requirements for assignments and tests. Students can download a test in the presence of a supervisor. The test is taken and returned via e-mail and the supervisor signs a printed form and mails it back to OTEN.

Assignments for which there are no supervision requirements are downloaded from the classroom on the web site and usually returned by e-mail when complete. Each teacher will specify the format required for the documents submitted. We found from experience that the form the attachments take can cause enormous difficulty for teachers.

If the assignment includes materials which cannot be e-mailed then the teacher can specify that printed assignments be posted to OTEN.

Reporting

Teachers keep their own records of assessment events and send them in to OTEN regularly so that the records can be kept up to date, these records are used both for off-site teacher payments and for OTEN student records. When the student completes the module, a final result must be submitted to the TAFE student information system via an official mark sheet which is completed by hand.

This is an area where our system is duplicating effort and the administrative effort required by the teachers is unnecessarily time consuming.

Selection of students

Application for enrolment in the course can only be made online. A web form for the applicant's details is submitted online and the data collected in the database. We do not accept postal applications as basic Internet competency is one of our additional entry requirements and online submission is taken as a partial indication of competency.

The data collected from the online application helps with processing the applications during the selection process and also provides us with basic contact information for successful applicants.

The data collected at this stage is separate from the official TAFE enrolment information and this creates another source of unnecessary duplication of administrative effort.

Learning Community

We work very hard at maintaining a learning community by making use of the networking ability of the Web in the following ways:

- Online teachers provide weekly announcements in their online classrooms to inform and motivate learners.

- Teachers appear to be available to answer questions by e-mail and annotations at all times through the students' ability to submit their questions as they think of them.

- Synchronous and asynchronous discussion groups are available as teaching devices.

- The course manager writes two newsletters a week. One newsletter is for students and covers general issues and matters relating to the course. The second newsletter is for staff and replaces the weekly staff meeting announcements.

ANALYSIS OF THE TOOLS AND TECHNIQUES

The actual choices made were not necessarily the best possible solutions but were often just what we could get at the time. Having worked with this system for a full three years now we know more about what we would like to have in the best of all possible worlds. Table 4 is a summary of our conclusions about what worked and what didn't.

Table 4: IT's online delivery program: what worked and what didn't

Tools/ Techniques	Students	Teachers	Administration/Managers	Remarks
Web-based server	+ Available from anywhere on the Internet.	+ Simple for teachers to make changes to the pages in their areas.	- Need to provide for technical support of server, and to manage the user accounts etc.	We have liked having the management of our own server because we have been able to experiment and get things right.
Provision of Information	+ Flexible access, can choose time and place to study. + Always know where to find class notes. - Expense of printing materials.	+ Lists of students to broadcast messages to. + Timely updates and changes to materials.	- Support for teacher and student access issues. - Backup systems, archives. - Management of versions of materials and students access to old versions.	Publishing content means that you can be sure of what a student has been able to access. Teacher managed updates means it can be kept current.
Annotations Technologies	+ Sharing questions and comments with other students. + Able to communicate easily with the rest of the class. + Able to see what questions other students have asked about a particular bit of the class notes. - Sometimes getting too much extra info about areas already studied.	+ Easy to communicate with the group. + Saves multiple answering the same question. + Provides easy indication of changes needed for next time. - Need to clean up old comments from last class. - Students are not familiar with the use of annotations and misuse them.	+ Creates a completely visible trail of teacher student interactions. + Able to audit the teaching/learning processes.	Able to create a classroom dynamic, helps make isolated students *feel* that they are a part of a group of students. Simplifies management of communications. Puts the teacher back in contact with their class.
Email	+ Direct contact from teachers at any time, from any place. + Can contact the rest of class directly through class lists provided. + Can initiate contact with teachers.	+ Can communicate with all students. + Can establish one to one relationship with students. + Can broadcast messages. - Can become too much work.	- Need to provide a way to keep email addresses up to date. + Students can update own records.	
Chat	- Not at convenient times. + Strong feeling of participation for some. - Difficult to get a word in for others.	- Problems getting enough students available at the same time, maybe different for bigger groups.	* Provision made but not used. Chat is provided as an optional tool to teachers.	Not of primary importance but worth having available for some groups. An optional tool which should be available when a teacher requires it.
Forums	+ Opportunity to create special purpose discussion with other students. - Required a different area and username to log on so didn't do it much.	+ Opportunity for class discussions. - Not used much.	* Provision made, not used. - Extra overheads of managing user accounts, security, backups, maintaining currency.	Students used annotation for this purpose.

Tools/ Techniques	Students	Teachers	Administration/Managers	Remarks
Assessment system	+ Fast turnaround of work with comments and marks from teacher. - The steps required to submit an assignment or test are confusing. + Great to be able to do tests at home. - Difficult to find a suitable test supervisor.	+ Can use various electronic assistants to mark assignments. - Large amounts of organising needed because of OTEN and TAFE reporting requirements. - Vulnerable to line drops.	- Depends too much on teachers' organising skills. - Missing or duplicated information common. - Special training for clerical workers to cope with different documentation.	In spite of all the difficulties it is still so much better for students to receive fast turnaround for their results and feedback. It is our first priority in redesigning this system to add an efficient assessment management/student records system which minimises the extra administrative effort.
Electronic Newsletters for course	+ Keeps learners informed about general events and deadlines. + Serves to remind students that they are doing this course.	+ Keeps teachers informed of what's happenning in program.	- Time consuming.	Yes. A significant element in creating the bond between all members of the community.
Weekly Roll Call	+ Simple to use.	+ Indicates that this student wants to be part of this community/class. - Doesn't indicate that a student is working on individual module.	+ Provides a good indicator of student commitment and participation.	Once it's set up it is trouble free, but there may be more effective measures which capture it to the individual module level and can capture how much attention the student is giving.
Modules are timetabled to have learner support	+ Provides motivation to get work done while teacher support is available. + Means there is access to the specialised teacher when you need them. - Fixed schedule may not fit with personal needs.	+ Good having students working together through module so that similar issues can be dealt with for whole group. - Needs more chasing of slow students.	+ Easier to organise teachers time for support. - Require much more organising of whole course.	It costs more but gives much better completion rates.
Orientation Day	+ Get to meet other students. - Have to gather in one place at one time. - Difficult and expensive to get there. + Opportunity to ask questions in person.	+ Teachers get to meet students. + Messages go to all involved with immediate feedback. + Can clear up misunderstandings immediately. + Ensures all students have skills to get started when they get home.	+ Verify all user accounts. - Stress testing of server when everyone accesses it at same time.	In spite of the extra work and expense, the orientation sessions saved on later misunderstandings and created the first bonds between students.
Workshops	+ Hands on learning and demonstrations. + Able to meet up with students met online.	- Often unfamiliar environment to work in.	- Locating laboratories with suitable equipment. - Locating suitable teacher.	Good for student experience if able to attend. If organisation difficulties are not too big then would repeat.

Tools/ Techniques	Students	Teachers	Administration/Managers	Remarks
Resources	- Expense of providing own equipment.	- Students have a large variety of equipment that the teacher is not necessarily familiar with.	+ No need to provide equipment for practical work.	The only way to ensure students have hands on access to equipment. An incidental benefit is the students develop a greater level of skills in having to find and set up their own equipment.
Results feedback	+ Good to be able to see whole classes results to see how individual marks are fitting in.	+ Nothing set up to do it so lots of extra effort.		In designing an automated system we would include the ability to see the whole classes results/progress (anonymously)
Selection of students	- Long winded application process.	+ Automated system of collecting application data was easy to use. + Careful selection of existing ability to use internet meant fewer problems unrelated to course content.	+ Additional admin effort to set up automated system. - Not connected to enrolment system so data needs to be reentered.	If the online selection system could be integrated with an online enrolment step it would be excellent.
Learning Community Student/staff biographies	+ Able to see who else is studying the course. + Some information available on other students.	+ Able to get an understanding of the students as individuals from biographies published.	+ Space provided for students to introduce themselves to the rest of their class.	A very important aspect of simulating college dynamics.
Online enrolment	- Not available.			Very desirable – the closer we can get to 100% online for all processes the more to be gained.
Online assessment	+ Could be interesting.	+ Useful for tracking progress.	- Expensive to create useful system.	Would like to try this

CONCLUSION

For those students who prefer to study off campus, online delivery has many advantages over other techniques in its ability to create a community. But until systematic automation of the administrative tasks can be provided we will have to limit the amount of effort teachers put in to foster a community experience for students.

What students want is to have all the benefits of studying in a college environment without the problems of time and location. Not only do they want to learn new skills, they want to complete a qualification and meet up with colleagues also involved in their field.

What teachers want is to have autonomy over their teaching space online at the same time as accessing the institutional administrative databases and shared resources systems. Teachers want to get on with their teaching and have all the administration handled for them.

What managers want is to ensure that a reliable and quality education service is provided at a minimum cost.

Everyone is likely to be happy if technology is used to minimise the repetitive tasks and let the individuals get on with the more creative aspects of teaching and learning.

References

Fitzgerald, M. (1999) 'Toward a Model of Distributed Learning: An Interview with Mike Fitzgerald' in *Educom Review*, November/December 1999. Available online at <http://www.educause.edu/ir/library/html/erm9967.html>.

Gibson, J. (1997) *Evaluation of a Trial of Internet Teaching in TAFE NSW*, AusWeb 1997, July, Brisbane. Available online at <http://ausweb.scu.edu.au/proceedings/gibson/paper.html>.

Holmes, W.N. (1999) 'The Myth of the Educational Computer' in *Computer*, September 1999.

O'Hara, K. & Sellen, A. (1997) *A Comparison of Reading Paper and On-Line Documents*, CHI97, July, Atlanta, Georgia, USA. Available online at <http://www.acm.org/sigchi/chi97/proceedings/paper/koh.htm>.

Webb, G. (1999) *The Economics of Online Delivery*, ANTA Net*Working Online Conference 1999, 19 July - 13 August. Available online at <http://vc.tafensw.edu.au/site/it/library/99webb01/99webb01.htm>.

Webb, G. & Cilesio, C. (1998) *An Investigation into the Costs and Benefits of Internet-Based Delivery*, Open Learning 1998, December, Brisbane. Available online at <http://vc.tafensw.edu.au/site/it/library/98weci02/98weci02.htm>.

Webb, G. & Cilesio, C. (1999a) 'The Results of an Investigation into the Costs and Benefits of Online Delivery', *EduCause* 1999, April, Sydney.

Webb, G. & Cilesio, C. (1999b) *Anatomy of a Successful Online Delivery Programme*, ANTA Net*Working Online Conference 1999, 19 July - 13 August. Available online at <http://vc.tafensw.edu.au/site/it/library/99weci04/99weci04.htm>.

Webb, G. & Cilesio, C. (1999c) *The Costs and Benefits of Online Delivery*, ODLAA 1999, August. Available online at <http://vc.tafensw.edu.au/site/it/library/99weci03/99weci03.htm>.

URLs (Links)

URL-1   The OTEN (Open Training and Education Network) home page: <http://www.oten.edu.au/oten>.

URL-2   The InfoTech Virtual Campus home page: <http://vc.tafensw.edu.au>.

URL-3   The O'Reilly WebBoard page: <http://webboard.oreilly.com>.

URL-4   The home page of BeachTech, developer of EForm software:
           <http://www.beachtech.com>.

Contact details

Open Training and Education Network (TAFE NSW)
Sydney NSW

Greg Webb
Ph: 02 9715 8514
Fax: 02 9715 8522
Email: gwebb@vc.tafensw.edu.au

Julie Gibson
Ph: 02 9715 8447
Fax: 9715 8400
Email: jgibson@vc.tafensw.edu.au