

# E-learning experiences at the Defence And Systems Institute

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***Abstract:** The development of e-learning courses at the Defence and Systems Institute (DASI) at the University of South Australia (UniSA) has been a steep learning curve. Ultimately, the application of systems engineering principles has pulled the many options together into coherent and well received courses.*

*This paper tracks the stages of transition from standard lecture-based face-to-face courses, to making the same material available on-line, up to the level where courses are specifically tailored to presentation on the Internet. There were many lessons learned along the way, and they may be instructive to other institutions aiming to develop their own on-line courses.*

## 1. Introduction

In order to understand the process involved in transitioning from purely face-to-face courses to on-line courses it is instructive to follow several threads. This is because a number of staff were involved in developing different courses for on-line presentation in the last few years. My own experience, perhaps, illustrates the plight of a minimally resourced transition. Other staff members were able to take advantage of more advanced tools and support from professional staff at the university, not to mention their own unique perspectives on the issues, objectives, and vision of the desired outcomes. This paper follows the processes that they used, and some of the lessons that they learned.

## 2. My own experience

When I started at UniSA I inherited an on-line version of a course on Systems Engineering and Complex Problem Solving – or SECPS. The course is based on the standard course infrastructure available on *UniSAnet*, which includes background documentation, slides of the lecture material, assessment tasks, background reading, and group discussions.

The students are divided into groups of four or five, and every two weeks they need to post presentations in Power Point on-line, together with a voice-over. I provide formative feedback on their presentations as well as on any focused questions that they discuss on their group discussion sites. This means that I can guide them towards the deep learning outcomes recommended by Biggs (1999a) and others. The learning pedagogy for this course is for students to learn the background knowledge from the lecture slides, participate in class activities, carry out similar activities in group settings, and finally to carry out the activities on their own. The vision is for students to develop the skills involved in developing concepts of a complex system, up until the stage of writing a specification.

The students are given ten weeks to complete the course work and deliver their final presentations, followed by a further five weeks to prepare their individual assignment. My job as lecturer is to provide formative feedback on their class work right up until their group presentation. After that I give summative feedback on their presentations with lessons learned that will prepare them for carrying out the individual assignment.

The student feedback was not positive at first. This is hardly surprising since there was minimal effort put into developing a dedicated on-line course. The slides only provide

disjointed sentences (since they were developed for face-to-face mode). The discussion sites are clunky, and students complain that it takes too long to get a response from someone on trivial matters that would take seconds in face-to-face mode. Also, the threads connecting particular conversations on the discussion forums have poor threading, so nobody can follow a line of thought unless it is the central discussion. Students also complain that there is not sufficient time for them to read the slides, read the background reading, do the exercises, do the assignments, and to fully develop the learning outcomes (even though they are given twice as long as for the face-to-face course presented over five weeks, and much more than the course presented over a single week in block mode).

The course is being improved each year. The most recent course, run in the first semester of 2009, included two face-to-face workshops with video-conferencing for those who couldn't attend. It also included several synchronous on-line discussions, as well as some audio content, particularly for guest lectures. There were also many small exercises for students to respond to in a dedicated discussion sites. All these improvements were welcomed by the students, and more were called for.

In future all lectures will be provided with audio content, resources permitting, the web-site will transition to a more modern platform, and synchronous on-line discussions will be convened once each week for the duration of the formal part of the course.

### 3. Experience of others

Other staff at DASI have also had experience developing and running on-line courses (my thanks to David Cropley and Peter Hamilton), a significant difference being that they are relatively well resourced e-learning courses that illustrate many of the most desirable features of a well planned and executed on-line course.

The first step is to guess how long a particular learning item should be. Taking into account the busy life that people lead, and the attention span of an average student (fifteen minutes according to Biggs, 1999b), a maximum limit was taken to be half an hour.

The format of any particular learning item followed the philosophy:

1. Tell them what you're going to tell them
2. Tell them
3. Tell them what you've told them

The next step is to determine how to present the different elements of the learning items. This is illustrated in Figure 1.

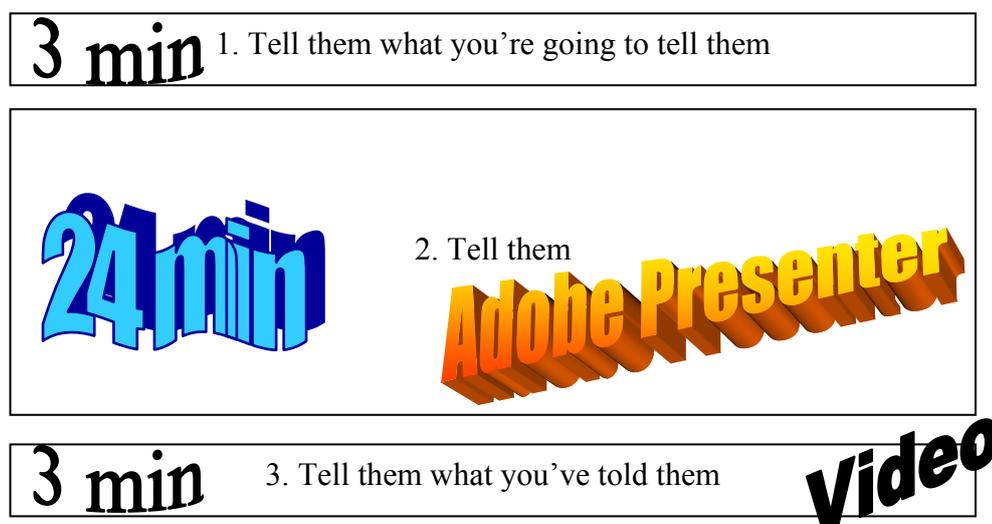
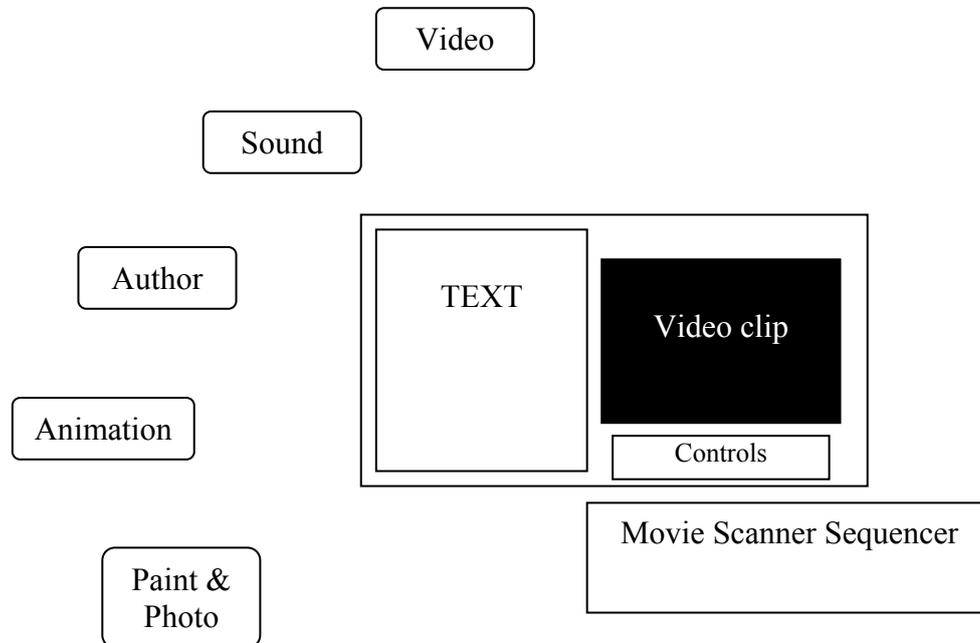


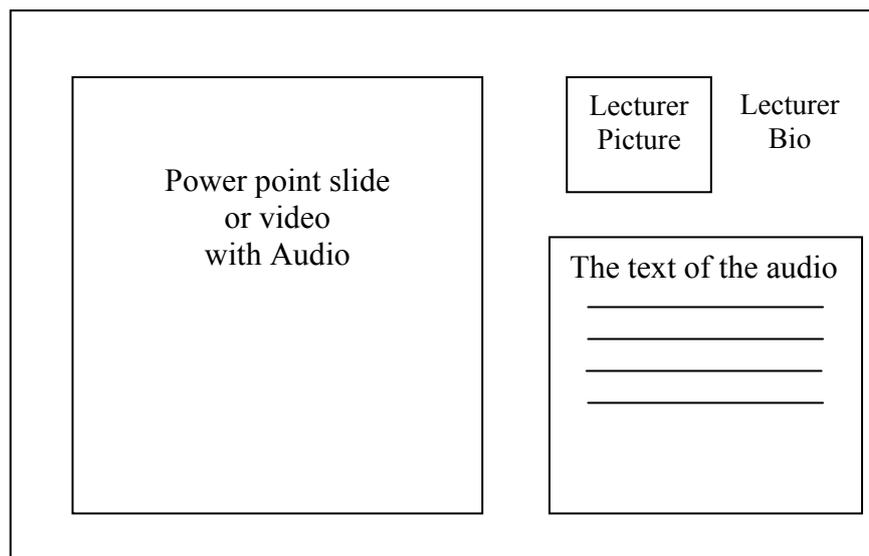
Figure 1. The implementation of a learning item

In order to take a video you need to acquire a video camera. After taking a video you set up your own video clip using, for example, Windows Mediaworks (it comes as an integral part of Windows XP or Vista). The basic information shown on the home page-finder illustration is shown in Figure 2 (from <http://www.mediaworkssoftware.com/products.html>). Among other things, this is useful for sequencing segments from YouTube videos that you might wish to include in presentations. However, care needs to be taken with copyright provisions.



**Figure 2. Home page finder for Microsoft Mediaworks**

The core tool of the presentation is Adobe Presenter - <http://www.adobe.com/products/presenter/?promoid=DNRQT>. You will need to buy a license for this. Presenter allows students to read slides, hear audio, and see a video, all at once. An example from the format of the combined output is shown in Figure 3.



**Figure 3. Example format of Adobe Presenter**

Figure 3 shows a video or presentation slide with sound, and written notes. A drawback of using this kind of tool is the high bandwidth requirements. It is often better to go for the slides

and audio components, leaving out the video. Pure experience also indicates that the video component provides little actual value in many cases, but consumes a disproportionately large amount of time to prepare.

An alternative is Podcasting (see <http://breeze.unisa.edu.au/podcasting>). This is audio with optional video, but it doesn't include other display tools, so it is of limited value.

In order to make an audio presentation you need to acquire a microphone and earphones. A good example can be found on:

([http://www.cybersnipa.com/images/products/sonar\\_headset/fullsize/full\\_sonar\\_06.jpg](http://www.cybersnipa.com/images/products/sonar_headset/fullsize/full_sonar_06.jpg)).

The next step is to sequence all the multimedia elements in some form of 'Running Sheet' (see Figure 4).

| Running sheet – Module A |              |          |         |                    |       |          |              |              |  |
|--------------------------|--------------|----------|---------|--------------------|-------|----------|--------------|--------------|--|
| Topic                    | Activity     | Lecturer | Method  | Media              | Mode  | Duration | From         | To           | URL  |
| 1                        | Welcome      | Smith    | Lecture | Adobe<br>Presenter | Async | 5 min    | 1/1/<br>2009 | 1/2/<br>2009 | <a href="http://www.unisa.edu.au">www.unisa.edu.au</a> |
| 2                        | Introduction | Brown    | Video   | Video              | Async | 3 min    | 1/1/<br>2009 | 1/2/<br>2009 |  |
| 3                        | ...          |          |         |                    |       |          |              |              |  |
| 4                        | ...          |          |         |                    |       |          |              |              |  |

Figure 4. Example Running Sheet

This is the core of the sequencing process for the lecturer. However, the essential elements can also be displayed for the benefit of the students. An example of an easy to follow 'Activity Log' is shown in Figure 5, where each element is hyperlinked to the relevant website.

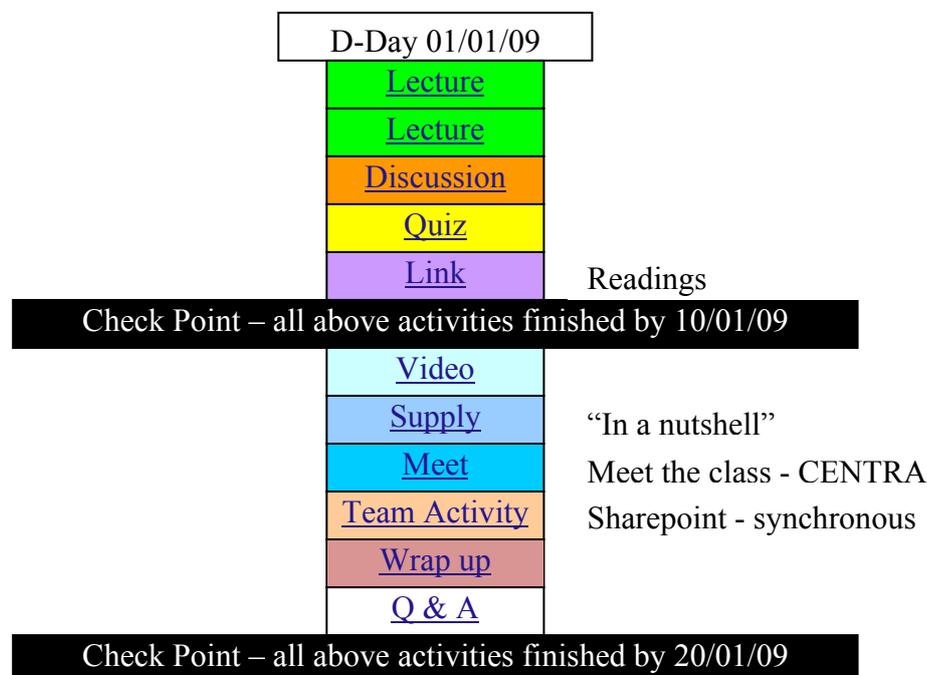


Figure 5. Activity Log

The information is condensed in this example so that the range of different activities can be seen. Different colours are allocated to each activity. 'Lecture' is presented as Flash files in Presenter. 'Discussion' is an asynchronous online chat. 'Quiz' is a series of quiz questions

embedded into the Flash files as either multiple choice questions, or open ended questions. ‘Link’ is a series of hyperlinks to material on the web for extra reading. ‘Video’ is a segment of video from the teaching staff, or an external hyperlink to YouTube or other video material. ‘Supply’ is a special five minute video introduction to a particular issue (e.g. How to work CENTRA) – called by UniSA, “In a Nutshell”. ‘Meet’ is a synchronous online meeting using CENTRA, or similar product. ‘Team Activity’ is a where the students work on their particular instance of the theme through synchronous or asynchronous activities. ‘Wrap Up’ is the final lecture that tells the students what they have been told, how to give feedback, details of remaining assignments and how they will be assessed, and a general pat on the back for making it to the end. Finally, ‘Q&A’ is an opportunity for students to post questions to a forum, and receive feedback from the lecturer. The black bars are particularly useful to students, as they signpost where they should be up to by selected dates.

The audio content of a lecture can be adlibbed, or scripted. For those who don’t want to script their lectures, they can record their lecture, and provide the audio file to the coordinator. This file is transcribed into text at reasonable rates, and the transcription is returned to the lecturer. The lecturer can edit out all the ‘ums’ and ‘ahs’ and the revised version can be placed next to the slides for the benefit of the students. The audio is then rerecorded against each of the slides. The advantage of this method is that the presentation is much more ‘alive’ and stimulating than a scripted version.

CENTRA is essentially a wiki, residing on the university intranet, which provides a forum for students and staff to interact in real time, or synchronously. An advantage of this is that confidentiality is assured since it doesn’t reside on a foreign server. Also it can be recorded for future use. You can also include video input in CENTRA using webcams, but again there is the inconvenience of requiring a large bandwidth.

Sharepoint is like a glorified Skype, where you can share documents, update them, and automatically maintain version control. This is critical for carrying out team assignments. One of the drawbacks of Sharepoint is that it cannot be used by some industry students due to firewall problems.

The development process also involves a cost, not just for transcription but for the time and effort involved in adding audio content. This is an extra cost over and above that involved in funding the development of the equivalent face-to-face course, and amounts to an extra impost in both time and money.

## 4. Discussion

It is not intended here to try and cover the broad spectrum of issues relating to e-learning tools, compare one tool against another, or even to present a survey of student preferences for, or reactions to, online course material (the latter will be presented elsewhere). The aim is to illustrate one pathway through the many e-learning technologies proliferating on the Web, with the objective of achieving deep learning in the desired learning outcomes for the students, as expounded by Biggs (1999a), Ramsden (2003) and others. In the parlance of *Pedagogies for elearning* (2008) there is a danger that on-line courses devolve into ‘content heavy’ materials (such as the many *MIT on-line courses*, 2008). Unless there is a close association made between the underlying teaching the learning pedagogy, and the means of delivery, there is, at best, only limited value in delivering the course in the first place. The important issue is not how to deliver quick and easy quizzes and the like, but is, according to Laurillard (2002), to allow students to demonstrate discursive, adaptive, interactive and reflective elements of their learning.

According to the constructivism pedagogy, learning involves what happens inside a student’s head rather than what is ‘taught’. According to Mayes & de Freitas (2003), the learner ‘actively constructs knowledge, through achieving understanding’. So on the one hand any course needs to be examined under the spotlight of learning outcomes, and on the other the presentation needs to be stimulating and digestible – particularly through the use of a large variety of teaching tools (Russell, 2008).

In summary, an on-line course needs to be developed as a dedicated e-learning course, with appropriate funding and lead-time for development. It needs to use a variety of tools that make it easy and exciting for students to learn, while remaining easy for the lecturer to develop, present and to assess. And finally it needs to be focussed on learning outcomes and evidence for deep learning.

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