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E-learning for Networked Living

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Abstract

Networked Living is a Level 1 course in Information and Communication Technologies (ICT) offered by the UK Open University. The first two presentation of the course, in October 2005 and February 2006, attracted over 3000 students between them. *Networked Living* introduces students to ICT concepts and issues in a range of contexts. The course adopts a supported blended learning approach, using printed texts, web resources, DVD and computer conferencing.

All the above media are used where appropriate to support students' learning. About 60% of the material is print-based – teaching texts, together with selected third-party articles. About 20% is web-based – using a comprehensive course web site, but also requiring students to find and use third-party sites. The remaining 20% is based on offline computer resources (e.g. spreadsheets) and collaborative activities using computer conferencing.

The course web site contains short animations, quizzes and several interactive activities where students contribute information and commentaries, and can then see the collated contributions of other students. The DVD contains longer animations, simulations and software. Computer conferencing is used for tutor-group and whole-cohort conferences, and for online tutorials, with both asynchronous and synchronous discussion. The course web site provides a shareable 'online journal' facility, where students can record their work for the course.

This paper discusses the various e-learning elements of *Networked Living*, based on the first two presentations of the course. The paper considers how e-learning can be combined with printed resources and tutor support (both face-to-face and online) to create a successful blended learning experience for students.

Keywords: e-learning, blended learning, computer conferencing, learning journal

Introduction

The UK Open University (OU) offers a wide range of courses to those who wish to study at a distance. The University is 'open' in that the courses are available to all: no previous qualifications are required. Most OU students are in full-time employment, while others may be working part-time or caring for families. So their Open University studies are typically on a part-time basis. Many students are working towards an undergraduate degree, spreading their study over several years.

Until fairly recently a typical OU course would consist of a set of printed course texts, supplemented by face-to-face tutorials. Students would carry out assignments which they sent to their tutor by post, and the tutor's feedback would be returned to the student by post. This 'supported distance learning' model is increasingly being transformed, through the use of technology, to a supported eLearning or supported blended learning model. This paper

describes the new approach as exemplified in the course *Networked Living: exploring information and communication technologies* (also described by its course code, T175) which was first presented to students in October 2005.

Overview of the course

Networked Living is a Level 1 course on Information and Communication Technologies (ICT). The course introduces students to ICT concepts, systems and issues within a range of contexts, such as entertainment, health and government (Bissell & Kear, 2006). As well as teaching students about ICT, the course aims to help students develop a range of generic skills. These include numeracy skills (including work with spreadsheets), communication skills (including computer-mediated communication), information literacy (including skills in finding and using online resources) and study skills. *Networked Living* is studied over a period of 8 months at approximately 8 hours per week. The course is presented twice a year, starting in October and February. Each presentation has around 1500 students.

Each student is assigned to a local tutor-group of around 15 students with one tutor. The tutor supports their students throughout the course, offers a number of group tutorials, and marks each student's written assignments. Computer conferencing is used so that tutors can provide online support and online tutorials for their students. Conferencing enables distance learners to carry out collaborative activities, and it can help to build a sense of community (see, for example, Swan, 2002; Haythornthwaite et al., 2000). The conferencing system used for the course, as for most OU courses at present, is *FirstClass*.

The course consists of 4 blocks of study, as follows:

- Block 1 *Living in a networked world* (four study weeks) introduces the course, and discusses the elements and processes of ICT systems. It also begins students' skills development.
- Block 2 *Communication and Identity* (8 study weeks) teaches students about networks, in particular the internet. There is a focus on skills in finding and using information, for example from the web.
- Block 3 *Entertainment and information* (8 study weeks) teaches ICT concepts and technologies in the contexts of entertainment and news broadcasting. This block also introduces basic mathematical skills and skills with spreadsheets.
- Block 4 *Health, transport and government* (8 study weeks) discusses ICT in societal contexts, using the examples of health, transport and government. The block brings together the skills which students have developed throughout the course.

Each of the blocks is assessed via a written assignment, which is marked by the student's tutor. Blocks 2, 3 and 4 also have short multiple-choice assignments, designed primarily to test students' numerical skills. The course culminates in a written 'end-of-course assessment', rather than an examination. This tests students' understanding and application of the concepts taught in the course, and provides an opportunity for students to draw together the different ideas. It also assesses students' skills development and requires them to reflect on their learning, in relation to the intended learning outcomes of the course.

A blended learning approach

When planning the course, consideration was given to the appropriate choice of media for different teaching and learning purposes. Historically, most OU courses have been delivered via printed course texts. However, the predecessor course to *Networked Living* had been delivered largely online (Weller & Robinson, 2001). The advantages and disadvantages of each of these methods were considered, and a decision was made to create a course which used a 'blended' approach. Where the topics to be taught require a discursive presentation, printed texts are used; where students need to find and use online resources, online presentation is used; where students need to use their computer, but do not need to be online, resources are provided on DVD. The result is a course where the balance between print-based material and computer-based activities varies from block to block, as follows:

- Block 1 *Living in a networked world* is a fairly equal mix of printed texts and online material or activities;
- Block 2 *Communication and identity* is mainly delivered online, because students need to access a range of web sites;
- Block 3 *Entertainment and information* is mainly in print, but also has a significant amount of hands-on computer work;
- Block 4 *Health, transport and government* is mainly in print, but is supported by online activities, animations and simulations.

A blended approach was also used for the tutorial elements of the course. The choices available were to offer face-to-face tutorials or 'online tutorials'. Traditionally the OU has used the face-to-face approach, where tutors host a two-hour session for their tutor-group every 4-6 weeks. However, many students are unable to attend face-to-face tutorials, so a number of courses have experimented with online tutorials, carried out using asynchronous or synchronous computer-mediated communication (Carswell et al., 2000; Mason, R., 2001; Hampel, R., 2006; Holliman & Scanlon, 2006). For *Networked Living* it was decided to use a combination of face-to-face and online tutorials, selecting the approach which was most suited to the material being studied at that stage of the course.

The course web site

Networked Living has a comprehensive web site which was specially designed for the course. The web site provides a range of resources and facilities for students in an attractive and user-friendly online setting. The home page is shown in Figure 1.

The web site provides access to all the course materials, either as web pages (for the online learning materials) or as PDF versions of the printed teaching texts. All the figures in the course have textual descriptions available via the web site, for accessibility purposes. A News area (to the right in Figure 1) ensures that students are kept up to date with any updates to the course or important notices. A set of navigation tags (shown across the upper area of Figure 1) gives students access to a range of facilities as follows:

- easy access to the home page;
- a course calendar with hyperlinks to the study materials and assignments for different stages in the course;
- the course assessment items (written assignment questions, multiple choice questions and the end-of-course assessment);
- the web version of the *FirstClass* computer conferencing system;
- a resources area with web sites and other online material referred to in the various blocks;

- an online learning journal where students can keep a record of their work for the course;
- a glossary with explanations of the key terms students meet in the course.

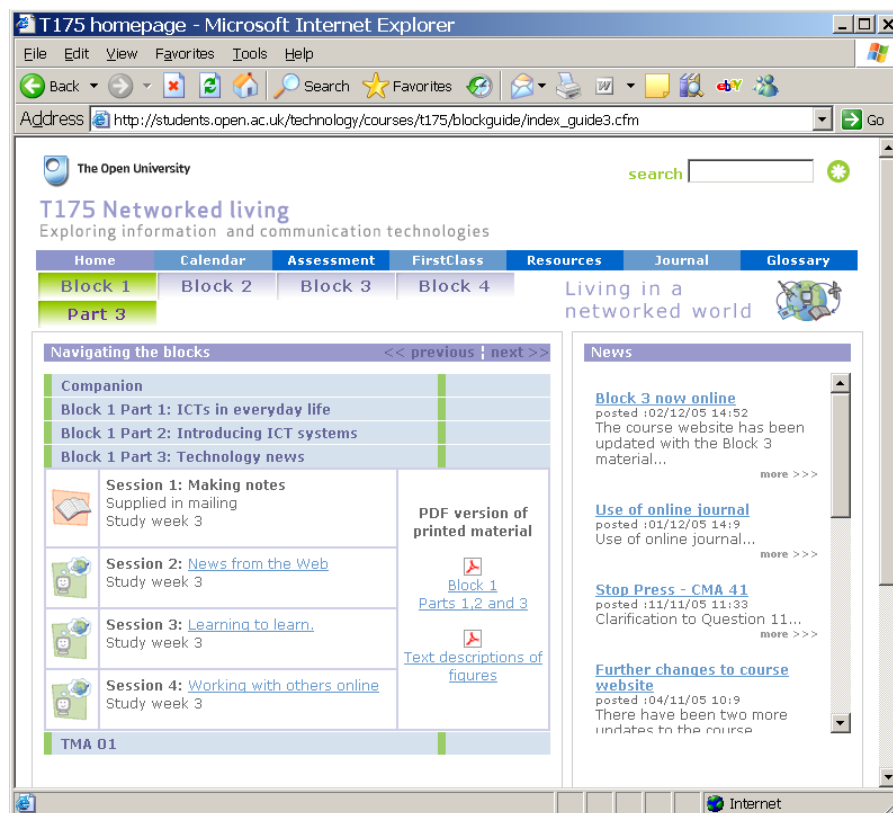


Figure 1. The home page of the *Networked Living* web site.

Online learning materials

The course web site is the delivery medium for the online content of the course. Most of this online material is to be found in Block 2, where it supports students in learning about the internet and the world-wide web. The main benefit of online delivery for this material is that it can integrate a range of non-OU web sites, encouraging students to engage with different online resources as a part of their studies. Students learn about useful websites, such as Wikipedia (www.wikipedia.org) and HowStuffWorks (www.howstuffworks.com) which they can use for keeping up-to-date in their subject. The content from these third-party sites forms an important part of the teaching material of the course, helping students to develop their skills in learning from a range of different resources. A number of generic OU websites are also used to support students' skills development. For example, a website from the OU Library teaches students how to search the web effectively and how to evaluate sites once they have found them. Other OU websites provide support for communication and learning skills.

When writing the online material, a conscious effort was made to create short 'chunks' of text which would look appealing and be easy to read on screen. These short pieces of text contain integrated links to other web sites. When a student clicks on one of these links a new window opens with the content of the web site. This means that students can move smoothly between the OU study material and the external web sites. The online material also has integrated links to the course glossary: when students first meet a new term it is shown as an active link. Then if the student moves their cursor over the term, the glossary explanation

pops up in a small window. The study material also includes a large number of activities, so that students are mostly 'learning by doing' rather than just reading.

Another benefit of the online material is that animations can be used. This is particularly helpful for teaching about systems or processes, as the different steps can be demonstrated in sequence, and explained using a voice-over. The online material in Networked Living includes many such animations, created using *Macromedia Flash* and with voice-overs by a professional actor. One of these animations, which explains how data travels across the internet, is shown in Figure 2. A detailed description and transcript of the animation is available for any students who cannot see the animation or who cannot hear the voice-over.

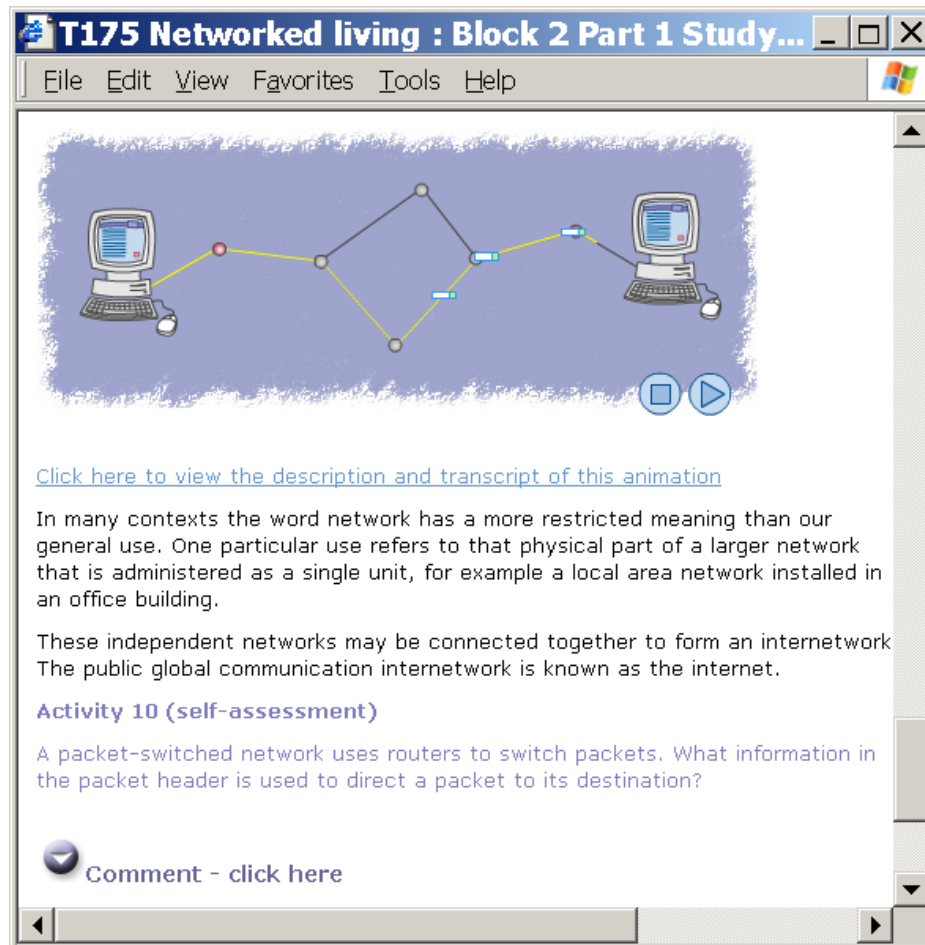


Figure 2. Part of the online course material

In a course questionnaire, one student commented on:

"the benefit of learning with the small animations that can be watched again and again. I also printed them with the transcript of the animation, which I found very helpful."

Figure 2 also shows how activities for students are integrated into the online teaching material. Comments or answers for the activities are initially hidden from the student, but are available by clicking on a hyperlink. The activities encourage students to take an active approach to their learning.

The online material also contains a number of short quizzes for students to complete. In some cases these are simply a set of multiple-choice questions which provide immediate feedback to the student. However, others are more in the nature of an online survey. Each

student enters their own responses, these are collated with the responses of other students who have completed the survey, and the results are fed back to the student. For example, Figure 3 shows part of a ‘technology attitude quiz’ which students meet in Block 1. The figure shows what is displayed to the student once they have entered their own responses. They can see how many other students agree with them and how many selected different response options.

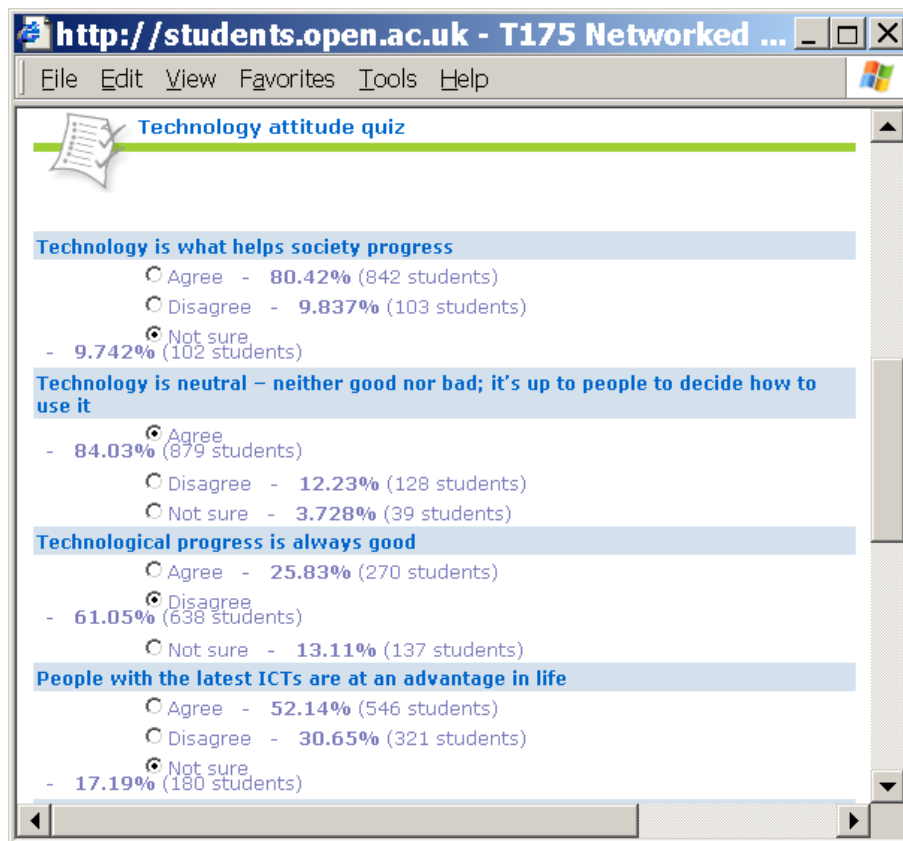


Figure 3. Feedback to students from the online ‘technology attitude quiz’.

Another kind of ‘lightweight’ collaborative tool used in the course is shown in Figure 4. Here students are invited to enter their comments on an activity they have just carried out. In this example, the activity was to use the web to learn about the internet protocols TCP/IP. When a student gets to this point in the material they can read what others have said, comment on any of the entries, and add an entry of their own.

These kinds of collaborative activities can help students feel part of a learning community, rather than feeling that they are studying alone. Students carry out the activities when they reach the appropriate point in the material and the activities do not take long to complete. Another benefit is that students do not need to wait for others’ input. One student commented on this activity in the course conference:

“Sharing the outcome of this learning semi-anonymously via the website’s interactive area is a great touch [...] invites short on-the-spot contributions, whereas a vague exhortation to go and discuss this in the Tutor Group probably wouldn’t have much effect.”

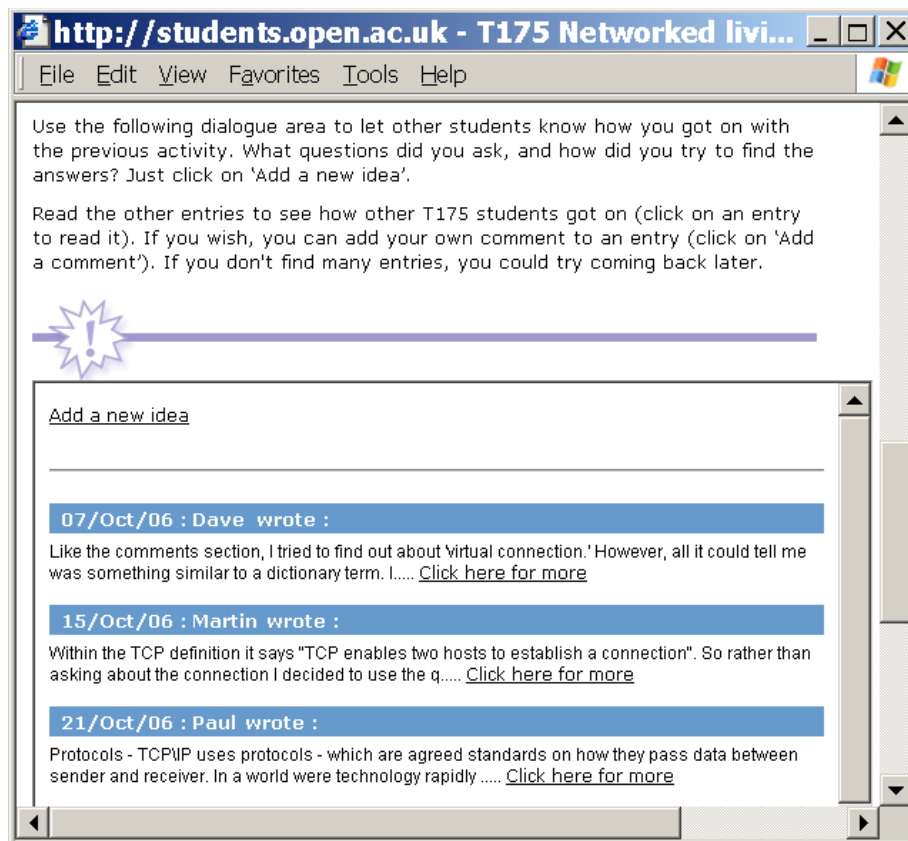


Figure 4. A dialogue area from the online teaching material.

One part of the online material which students valued highly was a set of activities which guided them in creating a simple web page and publishing it online. Students gained a sense of achievement from completing this task, and were pleased when other students looked at their web page and complimented them on it. In the questionnaire one student commented:

"All the online material was very helpful but I found the practical element of putting together a web-page helped me understand the processes involved. The animations were also helpful since they enabled me to visualise the topic of learning."

Overall, the online learning material seemed to be successful. However one factor that needs to be considered is the effect on students of online delivery. For some, it can reduce flexibility and take more time, as indicated in the following students' comments from the questionnaire:

"... it meant study could only be done at a PC, which limited for me the available periods to study – this meant study was broken up, consequently time was spent recovering ground due to fragmented study, i.e. trying to remember what I had last covered"

and:

"Although I find online learning enjoyable I find reading on-screen content slower and more tiring. I need to study in shorter periods with breaks."

Online learning journal

The course web site provides a shareable 'online journal' facility, where students can record their work for the course. Students are encouraged to use the journal for reflection on particular aspects of the course, such as their response to their tutor's comments on their assignments. The journal is loosely linked to the end-of-course assessment which students submit instead of sitting an examination. This assessment tests students' understanding of a range of material drawn from the whole of the course. It also asks them to select some of the learning outcomes from the course and provide evidence that they have achieved them. The online journal allows students to store their answers to the activities built into the course material and to retrieve them for inclusion in the end-of-course assessment.

The journal is integrated into the course website, and accessed from one of the navigation tabs at the top of every page. The main journal page lists the student's entries and allows them to be sorted by date, block, or topic. Although each journal entry is initially private, the student can choose to share it with their tutor and the other members of their tutor group. Each journal entry has check-boxes allowing it to be shared and/or selected for subsequent printing or downloading.

Creating a new journal entry is done via a standard template (see Figure 5). This has an automatic date field and fields for selecting the part of the course the entry relates to, and for entering a topic or title for the entry.

The screenshot displays the 'Your Online Learning Journal' interface. At the top, there is a header bar with the title 'Your Online Learning Journal' and a 'Close Journal' button. Below this is a navigation bar with tabs: 'Entries', 'New entry' (which is highlighted), 'Selected entries', 'View shared', and 'Help'. The main content area is titled 'New journal entry'. It contains several input fields: 'Date' (pre-filled with '04/03/06'), 'Block/Part' (with dropdowns for 'Block 2' and 'Part 1'), and 'Topic' (pre-filled with 'My first Journal entry for Block 2'). Below these is a large 'Notes' field with a rich text editor toolbar (including options for font face, size, bold, italic, link, unlink, and image). The notes field contains the following text: 'I have now completed Block 1, and have just started Block 2. Block 1 was a mixture of material in print and on the web, which made it quite varied. I managed to keep up, and submit the assignment on time, so I'm hoping that my mark for the TMA will be OK. Block 2 is different - the first two parts are all online. Just as well we now have broadband! I think I should get on OK with the first two parts of this block because I've used the internet quite a bit already. The third part (in print) is about other kinds of networks, so most of that will be new to me. Learning about Wifi will be good. But what's RFID? I've attached a file to this entry with my work for Activity 1.' At the bottom of the form is an 'Action points / Lessons for the future' field, which contains the text: 'Must remember that there is an online tutorial for this block. That will be a bit different to the face to face one for Block 1!'.

Figure 5. Creating an entry in the online journal.

Two free-form entry fields are configured for notes on the topic, and for reflection on action points and lessons for the future. Two final fields (not visible in Figure 5) allow files to be uploaded and attached to the entry and URLs of relevant websites to be added. These facilities allow students to incorporate evidence of their work, such as images, HTML files or spreadsheets. The journal was designed to be simple to use, with only basic features. Many students are new to the University, to studying, and to working online, and this approach minimises the time taken to learn how to use the journal.

Students are encouraged to use the online journal, but it is not a required element of the course work. Students' reactions to the journal have been mixed. Some students hardly use it, possibly because it is optional, but others use it regularly, as indicated in the following student comment:

"Some people didn't like using the online journal, but I found it invaluable - all my notes and activities were all in one place and labelled making them easy to find."

Usage of the journal is reasonably high when it is first introduced while students are working mainly online. But in the later stages of the course, when most of the material is in print, use of the journal decreases. As indicated in the following student comment, this could be because students are making their notes on paper:

"I used the online journal quite a lot near the beginning of the course and found it particularly useful for making notes when working online. However, with Block 3 I made most of my notes on paper – it's what I've been used to I guess, but also just as the online journal is convenient when working online, I find the pen and paper most convenient when working from the text books."

The course DVD

Students of *Networked Living* receive a DVD as part of their course material. The DVD contains computer resources which do not require students to go online or which would take too long to download. Most of the resources on the DVD are animations which help to explain different topics in the course. Figure 6 shows part of an animation, with voice-over, about biometric identification systems. The animations are each broken into short sections so that students can control their progress through the material, and can revisit a section if they wish to. Transcripts and full descriptions of the animations are provided.

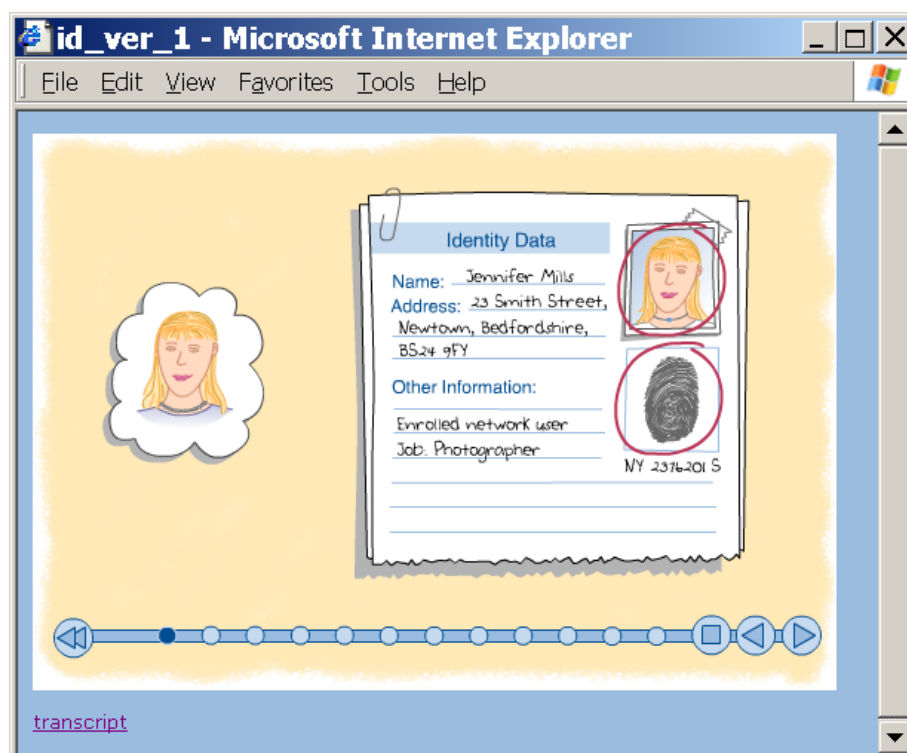


Figure 6. An animation on biometric identification systems from the course DVD

The DVD also contains interactive learning resources. The example shown in Figure 7 is a simulation to help students learn about queuing systems. Students are presented with a simple example of a queue at a roadside filling station. They can vary the rates at which vehicles arrive and at which they are served. By experimenting with the simulation, as part of a guided activity, students learn how different arrival and service patterns can result in different outcomes.

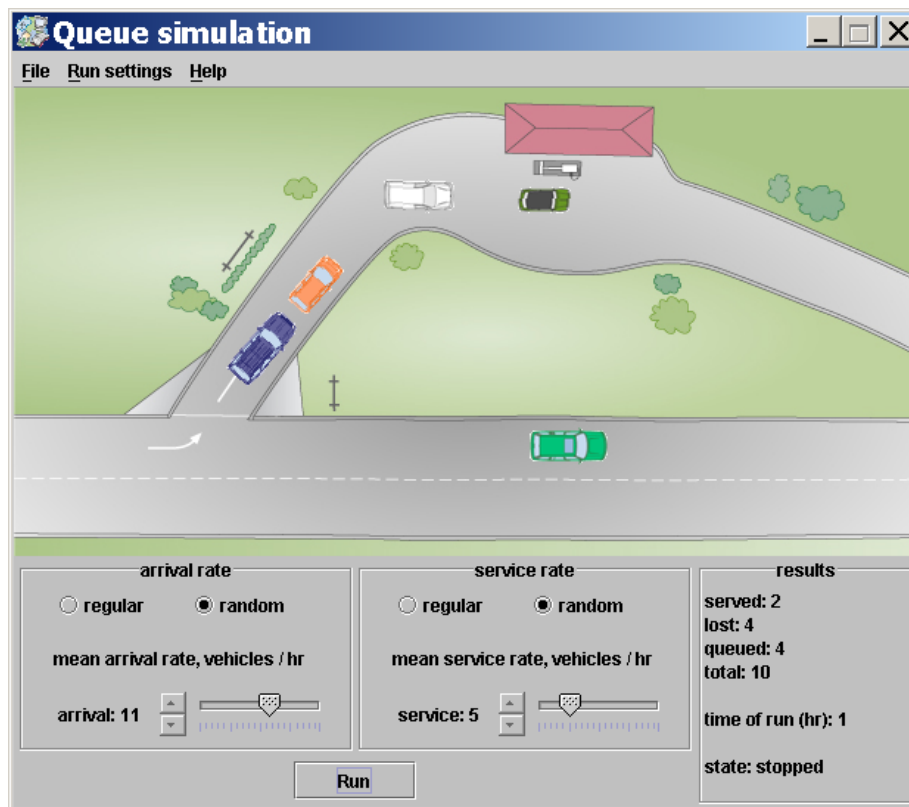


Figure 7. Queue simulation software from the course DVD.

The DVD also includes an extensive video presentation explaining how computer-based animations are produced. A simple graphics manipulation package is also included, which students use in order to learn about storage and manipulation of image files.

Computer conferencing and online tutoring

Computer conferencing is used for tutor-group and whole-cohort conferences, and for online tutorials, with both asynchronous and synchronous discussion. Each tutor has a group of approximately fifteen students who share a tutor group conference. Most of the discussions related to students' assignments happen in that small group. The tutor also facilitates online tutorials focused on collaborative activities and linked to the course assignments.

In addition, students have access to a set of moderated conferences that are open to the whole cohort. Some of these are read-only and act as notice-boards or provide answers to frequently asked questions. The three contributory conferences each serve a different purpose. One provides help with technical problems related to the course materials and software; a second is for discussing issues arising from the course; and a third is a social area for relaxation and general chatter.

The tutor group conference is more private than the larger conferences, and allows each tutor to work with their own students to support their learning. One of the ways tutors do this is by running online tutorials. The course currently has two online tutorials, one for Block 2 *Communication and identity* and one for Block 4 *Health, transport and government*. These online tutorial are linked to the block assignments, which award some marks for participation in the tutorials. This acts as an incentive for students to take part. Typically a student provides evidence of their participation in the tutorial by pasting messages into their assignment and providing a reflective analysis of them.

As an example, the tutorial linked to the second assignment asks students to read a specific article about email, find a web page on the same subject, and discuss both in the tutor group conference. This is followed by a synchronous 'chat' session in smaller groups, where students discuss the advantages and disadvantages of synchronous chat compared to asynchronous communication. The assignment includes a question related to these activities. For this question, students are asked to include a message which they contributed to the discussion, and to say how the message helped to move the discussion forward. They are also asked to summarise the advantages and disadvantages of synchronous communication which their group identified. One student commented:

"Taking part in the synchronous and asynchronous discussions was helpful in putting what I had learned into context."

and another student appreciated:

"The opportunity to use the 'chat' facility to see how this works in practice. I would not usually feel comfortable using this type of facility but was able to via the OU."

In *Networked Living*, as in many OU courses, students' assignments are submitted electronically to a central system. The system records their arrival and makes them available for the tutor to download. Once the tutor has marked and commented on an assignment, it is uploaded back into the system which records the score and makes it available for the student to retrieve. This system streamlines the submission and return of assignments, enabling students to receive feedback from their tutor with as little delay as possible.

Conclusion

Networked Living was designed to make best use of a range of e-learning elements, in combination with the more traditional printed and face-to-face components of distance study. The approach was to use technology where this seemed the most appropriate solution for particular educational purposes, rather than using it as a wholesale replacement for printed text and face-to-face meetings.

This approach has helped to make the course attractive, interesting and practical for students. Using a variety of media encourages an active approach to learning and allows for different learning styles and methods. Maintaining a significant printed component means that learners can study at a location and time that suits them best. Offering some face-to-face tutorials provides opportunities for students to meet their tutor and each other and then to continue to 'meet' online. The course provides an introduction to both online learning and more traditional distance learning methods, enabling students to experience both approaches.

The specific balance of e-learning and more traditional components chosen for *Networked Living* largely appears to suit present students of the course. However it will be important to

continue monitoring students' reactions, so that this balance can be adjusted as necessary. In the future, as distance learners have greater access to technology and become more familiar with it, they may prefer learning materials to be online rather than in print, and they may find online tutorials more convenient than face-to-face ones. Educators need to be aware of such changes, so that courses can make best use of technology to support learning.

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