Evolutionary course development in eLearning

Conference or Workshop Item

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Introduction

This paper seeks to set the scene for a discussion of an often ignored topic, namely,

> *How to create self-sustaining learning environments within which the evolution of eLearning courses can be supported?*

Specialist distance learning institutions, such as the UK Open University, have grown on a business model founded on 'economies of scale'; the high initial investment in the development of learning materials is balanced against low presentation costs for large cohorts of students. Course life-cycles commonly exceed 6 years. In some fields of study, especially those subject to rapid change, this business model is already outdated. Life-cycles have shrunk to months and development costs have fallen through the use of ICTs, but presentation costs have risen as teachers devote more time to online support. The new model is closely akin to 'economies of responsiveness'.

Our shared experience is that too often, once a course is produced, insufficient resource is available to support its continued development from one presentation (or semester) to another. At the best this can lead to stale courses and jaded academics; at worst the course deteriorates from one presentation to the next with worsening student retention and performance.

Over a period of three years we have been experimenting with a variety of techniques and tools that address such issues. The suite of courses we teach have in common a number of features: all are delivered electronically, student support is provided solely by means of asynchronous communication tools, and students are encouraged (and expected) to partake of a 'community of practice' (Lave and Wenger 1991).

This paper outlines the challenges posed by these issues as they have emerged within a suite of eLearning courses created according to the new business model, and describes one of the tools we have developed to support student driven course evolution.

Evolutionary models

No one writes about the evolution of courses, it is something we expect to do as part of our role as teachers. However, within the economies of scale model of traditional distance education the high 'tooling up' costs actually prevent evolution. With the exception of the few courses with very large enrolments, the economic model demands print runs covering multiple presentations. In fact almost any form of change to content, assessment, or student support is resource intensive.

Our experience is not unique, neither is it a feature of distance learning. The campus delivery model also suffers from resource constraints that minimise course evolution. For the courses we manage the primary constraints are:

Time — course presentations follow on too closely one after the other, sometimes only a week apart, leaving little opportunity for change.

Organisation	we have not had the tools to enable us to track simple errors, or more importantly the contributions from students.
Delivery	learning materials and support are delivered via different systems making it difficult for students to contribute to content.
Scale	a 12 week course with 1200 students may produce over 12,000 messages, making it difficult to identify and track evolutionary contributions.

So in an ideal world what would make a good evolutionary model? Some key requirements for us include:

Correction of typographic and factual errors. No matter how many times you read your own document it will still contains some sort of error and these errors get propagated from one course presentation to the next. Tools are required that allow instantaneous correction by the author. At present we 'copy and paste' messages into word processor files and, given time, use the message to correct the text.

Students should be able to contribute their own experience to the course 'content'. We have found many students able and willing to describe how specific technologies have been implemented in their workplace or offer alternative examples to illustrate a concept or technique.

Assessment is often the primary driver of student study and hence the most contentious element of a course. Student discussions about assessment can help teachers focus their thinking about the aims and outcomes of a course and hence contribute to its evolution.

The field covered by our set of courses changes rapidly, with new tools and standards emerging every few months. Students can provide alternative views of the field, encouraging use to keep subjects topical.

Early initiatives

Student contributions to our courses are not new; they have described work-related examples and personal experience, but the tools leave much to be desired. The primary tool has been asynchronous conferencing and hence contributions have taken the form of messages posted to forums offering broad coverage of the course content.

Those messages that could contribute to course evolution get lost amongst all the other messages posted and can be difficult to find once you have read them. Furthermore, students making such contributions are not thinking about evolution, but driven a discrete sequence of messages pertinent to 'today's' activity. Lacking any relationship to the course structure they are to all intents random.

One of our six courses deals with the role of databases in web applications and we took the opportunity to create a new asynchronous communications tool that would feature as a case study. It has also provided a research tool with which to evaluate new features and facilities (Kear and Heap 2005).

One of the most useful features we have identified is 'message clippings'. Any user can simply 'clip' a message to capture it within a set of personal categorised bookmarks. To relocate the message one opens ones 'clippings' list and clicks on a hyperlink. What has proved most powerful is that opening a clipped message returns you to the original discussion thread. In this way the message is seen in context including, most importantly, messages that came after the clipped message. These later messages may have solved the problem outlined in the clipped message; providing a convenient resource for updates and corrections. The clipping facility has changed the way we operate, leading to the evolution of what we believe is a better course.

Discussion Wiki

Learning Management Systems (LMS) and Virtual Learning Environments (VLE) feature prominently is any discussion about eLearning. Following a lengthy review of commercial, University, and open source systems, our own institution has recently committed £5 million to develop the Moodle VLE. However, a major weakness of all the systems reviewed is the 'distance' created between content and discussion. It is a distance that has become increasingly prominent in students' minds, leading to a reduction in discussion participation (Heap 2006). If students wish to raise a question about something they read or a figure they viewed, they have to recreate their mental association for others to share. It is this same 'distance' that makes it difficult to capture student contributions that would support course evolution.

To address this we have created a new tool that combines the features of the ubiquitous Wiki with asynchronous conferencing. Course materials are delivered by pre-loading the Wiki with 'structured' content[1]. Each Wiki page is subdivided into chunks (a few paragraphs of text, a table of data, or a figure) against which students may post annotations (public or private) and initiated a threaded discussion.

Figure 1shows the appearance of the discussion Wiki, the left hand column allows easy navigation around the materials, the centre column contains the chunks of materials and the right hand column is where the students can post annotations of start discussion threads. The screen shown in Figure 1 illustrates how a student has used a public annotation to add their own results from a practical activity.

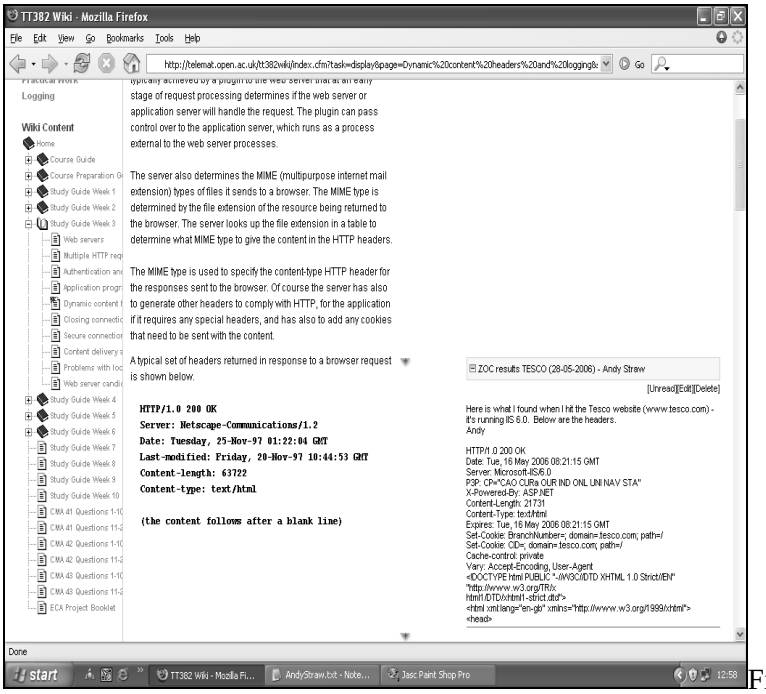

Figure 1 Public annotation

Students can also start a threaded discussion next to the chunk of content they wish to discuss.

New chunks can be added by any user, such as a student offering personal experience of a technique or a tool, or an insight into the relationship between concepts. Chunks can be appended to the bottom of a page or inserted before or after an existing chunk. In the present design chunks are owned and only the owner (or teacher) can edit a chunk.

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[1] The structure is derived from elements such as concepts, learning outcomes, narrative, definitions, examples, etc.

Examples of these interactions will be given in the handouts associated with the round table discussion.

As the course proceeds students can contribute to the community, and hence the evolution of the course, by adding new chunks, public annotations, or messages. What we have observed so far is that the majority of contributions offer fine-grained improvements by adding alternative perspectives, a few will lead to substantive improvements by way of changes to content and structure.

Outcomes

Whilst it is still too early to draw hard conclusions about use of the Wiki, students have reacted favourably and begun posting annotations and initiating discussion. They have been especially positive about the convenience of posting questions directly adjacent to course content. The majority of the questions posted relate to clarification of interpretation and simple typographic corrections.

Original contributions are less frequent, which is not unexpected as this requires considerable confidence on the part of the student. We already know that the majority of students restrict themselves to reading messages, with perhaps as few as 15% actively posting.

In terms of managing our courses the Wiki has already proved invaluable allowing us to correct minor errors and improve descriptions as they arise. The on-line version of the course materials has become the shared ‘master document’ and will provide the source for the next release of PDF materials.

We readily acknowledge that the work reported is at an early stage and we welcome the opportunity to broaden the discussion and share other approaches.

Background

The courses that have informed our thinking are part of a Certificate in Web Applications Development, which comprises six courses each presented over a 12 week period and requiring an average of 100 hours of study. All learning and assessment materials are delivered on-line as PDF files. Some course include text book which is sent by post.

Support for the students is provided by a moderated asynchronous computer conference which forms parts of the resources on the course website. Students can post questions to the conference and receive replies from fellow students, the moderators, or the course presentation chair.

On average over 50% of students’ queries posted to the conference are answered by other students without the need for intervention from the moderator or presentation chair.

Role of a moderator

The moderator’s primary role is to promote and facilitate discussions on the course conference, to gently ‘police’ contributions, and to correct factual errors that may arise in posted messages. During the presentation of a 12 week course with 150 students they would read some 2500 - 3000 messages and send about 120- 150. At the end of the course the moderator marks the final assessment under the supervision of the presentation chair.

Role of the presentation chair

The presentation chair is responsible for all facets of the course during its 12 week life. Most important is that they are responsible for all the materials presented to the students, the course assessment, and they are the final arbiters of issues concerning the course. They too are active on the conference; taking the role of super moderator and being the source of academic and

administrative advice. Like moderators, they would read the majority of messages, but expect to send 80-100% more.

A crucial role for the presentation chair, in the context of this paper, is that they are the person responsible for the evolution of the course into the next version ready for the next presentation.

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Glyn Martin is currently involved with the updating and presentation of three courses in the Web applications development certificate. His current research interests include the development of web based tools to support the delivery of learning on the web. The particular emphasis of this research is to capture the knowledge of students so as to enhance the course during a presentation.

He has also developed distance learning systems for the UN Staff College, the World Intellectual Property Organisation and UNFPA

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Nick Heap has contributed to 15 distance learning courses, as team leader for 8, and been responsible for many innovative developments of ICTs for teaching, including: home computing and computer conferencing, CD-ROMS for resource-based learning, and group projects supported via asynchronous networks. Author of six textbooks on digital electronics and networks, more than 30 papers in the field of acoustics, and 20 papers covering technology for open and distance learning. Nick has held visiting appointments at Penn State University, the University of Quelph, Ontario, and the Staff Engineering College, Hyderabad.

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