

## **A CENTRALISED APPROACH TO THE ADOPTION OF A UNIVERSITY-WIDE WEB-BASED LEARNING TOOL**

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### **ABSTRACT**

*This paper reviews some processes undertaken at the University of Technology, Sydney in 1997 to research, trial, select and make available to the entire university, a Web based conferencing environment called 'TopClass'. It locates the rapid takeup of TopClass in the 'diffusion of innovations' literature, specifically Rogers (1983) and Geoghegan (1996); outlines the genesis of its use; describes the tool's functionality; contrasts the available features to other tools available and makes some recommendations for ideal conferencing features. In conclusion, a case is made for 'less is more' in this context and some lessons learned along the long road from innovative first use, to mainstream acceptance by the University are noted.*

### **KEYWORDS**

Web-based learning, web-based conferencing, diffusion of innovations, flexible learning.

### **1. INTRODUCTION**

The World Wide Web is the latest 'new technology' to be embraced by enthusiastic educators who wish to: improve learning outcomes; to increase and extend access to education; reduce the costs of education; and improve cost-effectiveness (Bates, 1997). Almost weekly, newspaper articles around the world report that a particular university or college has 'n hundred courses' available on-line, although it would appear that much of the focus of a number of these pioneering efforts is on the reproduction of course/subject outlines online, and the provision of lecture notes and other information for student access (Alexander & McKenzie 1998, 30). The focus of this paper is on the use of the Internet as a communication medium, and is underpinned by the authors' belief that if this round of 'new technology' is to be successful, then the focus of development effort should be on the design of what the students DO with the information and resources provided, rather than only on the attractive repackaging of existing materials.

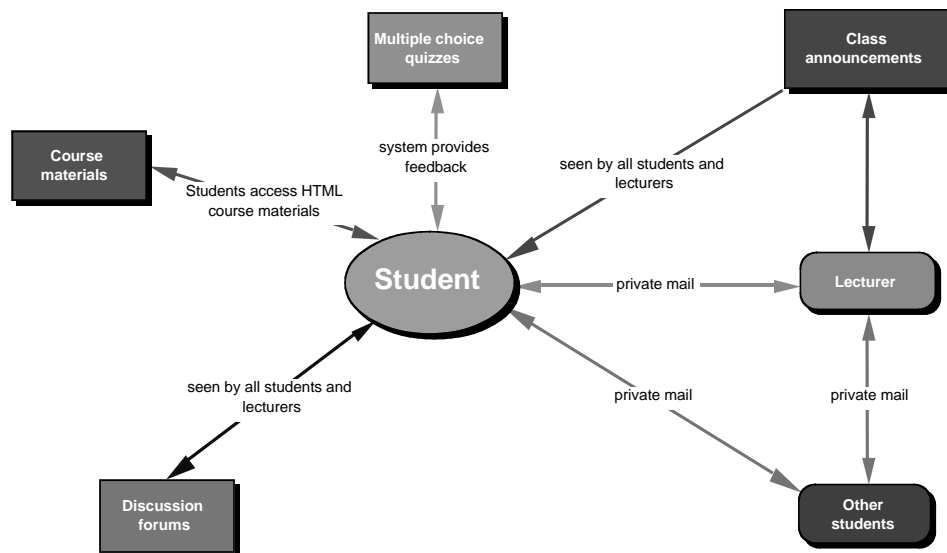
The Internet-based tool which has been adopted at UTS to facilitate communication between students, and between students and teachers, is TopClass, by WBT Systems in Ireland. Its adoption was recommended by a university-wide Flexible Learning Action Group (FLAG) on Internet use after a significant review of all available tools according to a framework which is detailed later in this paper.

## 2. BACKGROUND

The FLAG group on Internet use was one of six such cross-faculty working groups established in September 1996 to explore different aspects of flexible learning. Funds were made available to each of these groups to initiate pilot projects which would demonstrate the ways in which each aspect might be used to facilitate flexible learning.

At initial meetings of the FLAG group, academics from across the university were invited to give presentations on their use of the Internet in teaching and learning. The first author of this paper had been the first user of TopClass (or WEST as it was then known) at UTS, in a Computer Managed Learning (CML) subject. In this case TopClass had been used because it provided a simple, structured HTML-based communication, management and authoring environment giving students access to:

- coursework;
- email;
- discussion groups;
- class announcements; and
- instructor mediated and automated testing.



**Figure 1: The basic functionality of TopClass and its inter-relationships**

It allowed graphics and other multimedia elements to be integrated within its question framework and provided an open, flexible and distributed environment which existing standalone or LAN-based CML systems could not. (Figure 1)

TopClass was further used as a student communication and testing framework for an adaptive hypermedia research project in collaboration with John Eklund of the Faculty of Education (HREF1, HREF2, HREF3) and this project was presented to the FLAG group.

The initial demonstration of TopClass generated a great deal of enthusiasm from FLAG group members, many of whom had been using a variety of similar tools, but who frequently reported mixed experiences of their functionality, as well as difficulties with hardware and software maintenance which was often being done at a local level. A decision was made to carry out a review of all existing tools within a framework to be determined following the first stage of research.

### 3. THE SELECTION PROCESS

The study commenced with a review of the learning designs which facilitate deep approaches to learning and which could be used over the Internet. A list of the important features required of a communication tool to facilitate development of these learning designs was compiled.

In parallel with this research, a review of the literature on diffusion of innovations and change management was carried out, leading to the development of a set of guiding principles in selecting an appropriate tool.

Firstly, the diffusion of innovations literature (Rogers, 1995) notes a number of characteristics that influence the rate of adoption of innovations. The most significant of these for this particular project appeared to be related to the complexity of the product. Rogers notes that an innovation's *complexity* (how difficult it is to learn, to understand, and to use) as having an impact on its adoption, as well its *trialability* (ease of experimentation prior to adoption) and *relative advantage* (time, cost, effectiveness etc). Thus an important criteria in selection of the communication tool was its *simplicity* – it had to be easy for the users (academics and students) to learn to use, in terms of the time it took to learn and the complexity of use. The issue of complexity is also noted by Moses (1998) in her 'Desiderata for successful introduction of change'.

The list of minimum features which were determined as essential for a range of learning designs to facilitate: public and private discussions; debates; role-play/simulations; and on-line quizzes included:

- private email;
- threaded discussions;
- anonymous discussions;
- multiple discussions;
- open and closed discussions (esp. for debates and other group learning activities);
- attachments and document uploading; and
- assessment development capability.

In consideration of the issues raised above, the following criteria were regarded as essential for successful adoption of the chosen tool:

- it should be browser-based;
- it should be easy to learn, for both teachers and students;
- it should not require client software for course authoring;
- it should be inexpensive;
- support for the tool should be provided by telephone and email by the supplier; and
- it should be available for a range of servers.

The tools reviewed were:

- WebCT (beta version);
- Lotus Notes 4.5;
- Altavista Forums 2.0;
- First Class;
- Netscape Collabra; and
- HyperNews.

After an exhaustive review process TopClass was considered the most likely to succeed in the short timeframe available. At the time of review (Dec 1996 – Feb 1997): WebCT was only available in beta version and hence not suitable; Lotus Notes did not have browser access available as yet and was regarded as difficult to setup ie. clients needing 40+ megs free hard disk and 12 megs plus free ram etc.; and Firstclass had an excellent custom client but browser based access to all system features was considered essential.

#### **4. TRIAL OF TOPCLASS**

It was clear that initially, the FLAG group was made up of academics whom Rogers would describe as ‘innovators’ – those willing to try out new ideas, and who would do so with a minimum of support. Clearly, if this innovation was going to extend beyond this group to the ‘early adopters’ and the ‘early majority’, groups characterised as having an aversion to any innovation which is difficult, not proved, and which is lacking in support, that the tool chosen would need to undergo substantial testing and reporting to satisfy those groups of its viability.

A large-scale pilot was then undertaken with 800+ undergraduate students in first semester 1997 in collaboration with Mark Freeman of the Faculty of Business (HREF4). This trial highlighted the importance of a range of support issues and the FLAG group subsequently lobbied the university administration (successfully) for:

- telephone help desk support from 8am – 12midnight Monday to Friday, and 8am – 5pm Saturday and Sunday for staff and students;
- centralised housing and maintenance of 2 web servers (production and backup), as well as software;
- server support with 2 hour maximum response time out of normal operating hours;
- centralised facility for automated enrolment of students from student administration database; and
- staff development support for academics and support staff who wish to use TopClass (see Housego, 1998).

Interest in the trial project was such that, by second semester 1997, TopClass was integrated into 35 individual subjects, involving some 3000 students. Academics and students used the system for class announcements and basic communication, as well as for higher level uses such as structured debates, simulations and roleplays. By first semester 1998, there were 80 subjects and over 6500 students enrolled in TopClass.

#### **5. CURRENT STATUS OF TOPCLASS**

The cost of TopClass for UTS has risen from US\$7400 (for a 500 user simultaneous licence) in 1997-98 to US\$20,000 in 1998-99 (for up to 10,000 active students) and there has been a further price rise recently which could make the cost to UTS US\$40,000 for the year 1999-2000. However, since the initial decision to use TopClass was made, a number of other tools have become available, and since the FLAG group is committed to the learning ideas rather than the tool itself, a close watching brief on these new tools continues. Refer Table 1.

**Table 1**

Comparative features of currently available distributed learning frameworks

	Multimedia coursework	email	announcements	discussions	chat	inbuilt assessment	browser based	work offline
TopClass	•	•	•	•	1	•	•	
Learning Space	•	2	•	•	3	•	•	7
WebCT	•	•	•	•	•	•	•	
FirstClass	4	•	•	•	•		5	8
Collaborative Classroom								
CourseInfo	•	•	•	•	•	•	•	
WebMentor	•	•	•	•		•	•	
Convene	•	•	•	•		•	6	•
Web Course in a Box			•	•		•	•	
Virtual U	•	•				•	•	
Toolbook Librarian	•	•				•	9	
Real Education	•	•	•	•	•	•	•	

1. no, however UTS easily integrated a java based chat system within the TopClass shell.
2. yes, however the email is not fully integrated within the system and requires an external POP 3 client.
3. no, however Lotus has recently acquired the real-time chat system 'Virtual Places' which will be integrated soon.
4. no, FCCC is primarily a text based communication system although documents containing multimedia elements can be held within FCCC mailboxes
5. yes, however very limited functionality is available.
6. no, however client software is available for macintosh and windows and Convene will handle all technical and server support.
7. yes, but only with the full Lotus Notes client not a browser.
8. yes, but only with the full FCCC client, not a browser.
9. yes, but loads a java applet for course shell.

It is interesting to note that both Convene and Real Education do not sell server software but provide a course hosting service whereby they take responsibility for all software, hardware and end-user technical support. This is an interesting recent development which the FLAG group is actively investigating for economic viability.

## 6. LESSONS LEARNED

- Central University support for software, hardware etc., was crucial to the project's success
- Initial intensive one-on-one mentoring sessions and later group workshops with staff were fundamental to the rapid adoption and acceptance within the existing teaching culture
- Removing administrative burdens from academics so that the focus of their effort could be on learning design was paramount
- The framework used in the selection process did not necessarily allow for the extremely rapid take-up of TopClass and that framework is now being reworked to better address administrative scalability issues

- In courses with an intensely visual focus such as design or architecture there is often a requirement for students to upload photographs/images which TopClass does not as yet allow. To overcome this limitation UTS is investigating a virtual student gallery that can be launched from within TopClass where images can be uploaded by individuals for appraisal and review by others
- TopClass uses a proprietary backend database which does not co-exist with existing legacy (student records, exam results etc) and desktop (class lists, student grades etc) database systems. TopClass can not as yet be programmed or scripted to query and import records from an SQL datasource, so the enrolment of students at present is a tedious and error prone manual process
- TopClass has no integration with central directory services such as LDAP (Lightweight Directory Access Protocol) which is an increasingly used standard for the central storage of user information (names, addresses, phone numbers, email addresses etc, etc.) that would make sense as the foundation for next generation records management systems
- It has poor integration with existing and emerging internet mail standards such as POP 3 and IMAP which makes TopClass difficult to integrate with existing email networks.

## 7. CONCLUSION

Web-Based Learning (WBL) tools are still in their infancy and at this moment have poor integration with existing systems, but with the rate internet applications are being developed the sophistication and usability of these tools can only improve. The authors believe that TopClass in terms of its simplicity, trialability, ease of learning, and highly-visible benefits is 'sophisticated enough' to be a useful student/teacher communication framework that is easy to setup and maintain and relatively inexpensive. Over-complexity would have had a disastrous effect on a project implemented in this timeframe and on this scale.

However, the authors also believe that any implementation of such a system without careful consideration as to the necessary support requirements, without adequate research into learning designs appropriate to this medium and without provision to students of learning experiences that are engaging and qualitatively different to those achievable face to face, would more than likely fail.

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[HREF4]

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<http://cleo.murdoch.edu.au/gen/aset/ajet/ajet13/wi97p23.html>

## 10. LEARNING SHELL PROVIDERS.

TopClass	<a href="http://www.wbtsystems.com">http://www.wbtsystems.com</a>
LearningSpace	<a href="http://www.lotus.com/">http://www.lotus.com/</a>
WebCT	<a href="http://www.webct.com">http://www.webct.com</a>
FirstClass Collaborative Classroom	<a href="http://www.softarc.com">http://www.softarc.com</a>
CourseInfo	<a href="http://www.courseinfo.com">http://www.courseinfo.com</a>
WebMentor	<a href="http://www.avilar.com">http://www.avilar.com</a>
Convene	<a href="http://www.convene.com">http://www.convene.com</a>
Web Course in a Box	<a href="http://www.madduck.com">http://www.madduck.com</a>
Virtual U	<a href="http://virtual-u.cs.sfu.ca/vuweb/">http://virtual-u.cs.sfu.ca/vuweb/</a>
Toolbook Librarian	<a href="http://www.asymetrix.com">http://www.asymetrix.com</a>
Real Education	<a href="http://www.realeducation.com">http://www.realeducation.com</a>

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