

The Impact of Web-Based Educational Software: Off-the-Shelf vs. In-House Developed Software

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Abstract

In this paper we present the impact of Intercollege's Web-Based Teaching and Learning Environment (IWBTL). IWBTL allows lecturers to develop web-based educational material using Web-based educational software - WebCT (off-the-shelf software) and InterLearning (in-house developed software). The on-line material is available to the students through our Intranet and Internet sites. It is important to note that at this stage the aim of IWBTL is to provide enhanced educational support to the students and not to replace traditional teaching and learning. The development of the InterLearning software and the development of the on-line material using both WebCT and InterLearning was funded by Intercollege and the Cyprus Research Promotion Foundation. The on-line material was used by the students during the 2002-2003 (WebCT) and 2003-2004 (InterLearning) academic years. In this paper, we report on how students rated the WebCT and InterLearning software environment and their supporting tools and present a comparative analysis of the students' feedback. We also report on the lecturers' evaluation of the InterLearning software. This survey analysis helps us design our strategy in terms of what tools to use for the IWBTL.

Keywords: Web learning; teaching environments; WebCT; InterLearning.

Introduction

The World Wide Web (WWW) is a popular and useful instructional tool for a many reasons. It is easily accessible, supports flexible storage and display options and provides a simple yet powerful publishing format to incorporate multiple media elements. The WWW provides an excellent platform for developing, organizing, and spreading variety of resources, including class notes and outlines, long textual resources that resemble traditional textbooks, interactive nonlinear tutorials, student questions and comments, and even simulations of individual class sessions. It also allows instructors to prioritize resources and students to reorganize the resources in the way that fits them best. Many Universities and Colleges have utilized the WWW for developing distance-learning education courses.

Intercollege is the biggest private College of Higher Education in Cyprus providing education to about 5000 students. The College is currently in the process of implementing its strategy for delivering web-based teaching and learning material. A key question that has to be answered is

which software platform should be used for the development of such material. So far, there were different independent attempts by various individuals and groups of people at the College, using various resources to develop on-line teaching and learning material. There was no co-ordination or strategy in the College for uniformity and standards. In order to co-ordinate the various attempts for setting up a uniform web-based teaching and learning environment, the College decided to employ the use of the WebCT software and at the same time to develop its own in-house educational software (InterLearning). WebCT (WebCT 2004) is well known educational software providing similar functionality to Blackboard (Blackboard 2004). InterLearning is an in-house developed software, developed as part of a project funded by the Cyprus Research Promotion Foundation. Part of this project is the evaluation of both the WebCT and InterLearning software both from the point of view of the students (users) and lecturers (developers). Data from the evaluation of this project will help the College to fine-tune its strategy and implementation steps towards distance learning education. The work and other results of this project, as well as more discussion and references on distance-learning Web-Based education can be found in (Pouyioutas et al. 2004a, Pouyioutas et al. 2004b, Pouyioutas et al. 2004c, Pouyioutas et al. 2004d, Pouyioutas et al. 2004e, Pouyioutas et al. 2004f, Pouyioutas 2003, Ktoridou & Pouyioutas 2002).

Herein, in the following (second) section we present the InterLearning in-house developed software. In the third section, we present the results of the students' evaluation of the WebCT and InterLearning environments and the impact that open learning educational material had in their studies. We also discuss the actions arising from our assessment of the students' evaluation. In the fourth section, we present the results of the lecturers' evaluation of the InterLearning environment. We have not yet been able to obtain lecturers' evaluation of the WebCT environment since very few lecturers are able to use the WebCT software. Finally in Conclusion, we discuss our current and future work related to Intercollege's Web-Based Teaching and Learning Environment.

The InterLearning Software

InterLearning is in-house developed software that allows lecturers to develop and post on the Faculty Intranet, educational material. Students have access to the material through the Intercollege Student Intranet and also through the Web. The InterLearning interface showing the facilities available to the lecturer is shown in Figure 1. In addition to that, the student view of the system includes the facility to E-mail the lecturer. It is important to mention that for the moment the InterLearning software does not provide some of the facilities provided by WebCT due to the fact that it has been developed to provide supporting (to lecturing) on-line educational material and not to be used for developing material that will replace teaching.

The InterLearning File Manager allows users to create a folder/directory hierarchy and download files and place them in folders. Figure 2 shows that these folders/files are assigned, by the system, a unique URL address.

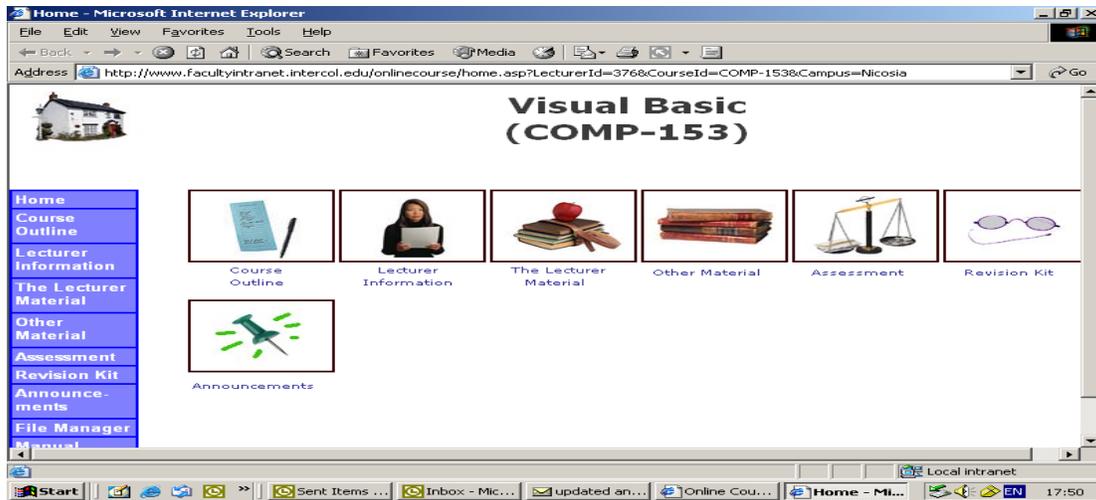


Figure 1. The InterLearning Interface

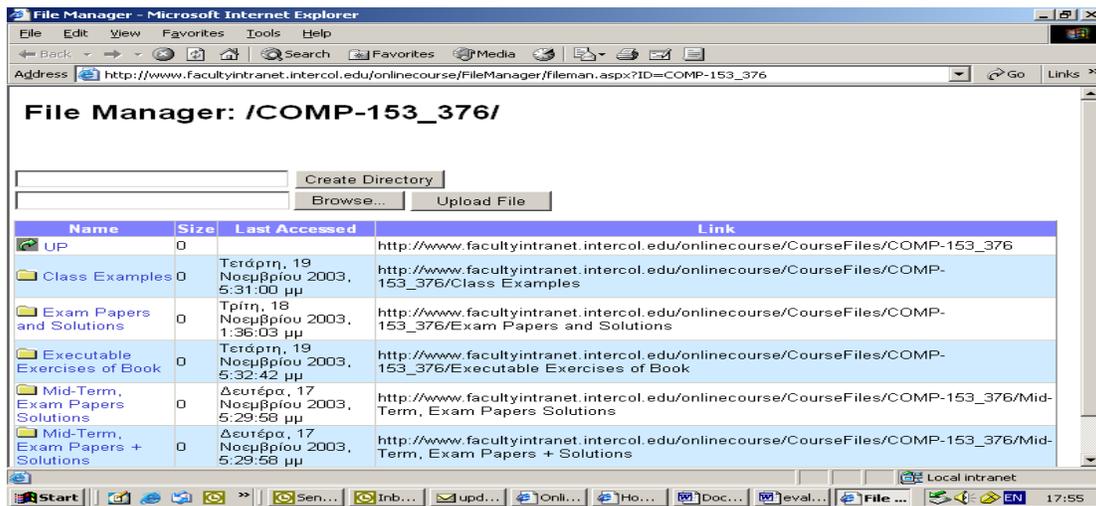


Figure 2. The InterLearning File Manager

The Interface then allows users to create sections with instructions to students and links to the relevant URL addresses of the folders and files or to any other URL address. This can be seen in figure 3.

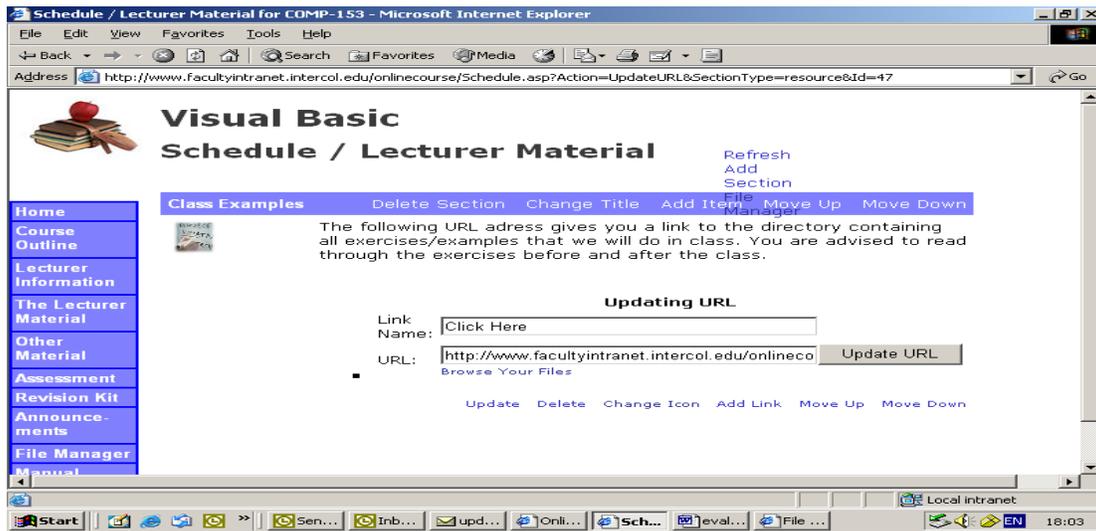


Figure 3. Linking the Interface with the File Manager

The InterLearning architecture is shown in Figure 4. The system is implemented as a WEB based data driven application. We are using Microsoft SQL server for maintaining a database that stores the content of the course sites. Web Server applications are developed using Microsoft ASP scripting. There are two parts – Designer and Viewer. These are integrated with Faculty and Students applications respectively. They include templates for each page of the standard Course WEB site and scripts, which fill up templates with data taken from the database. Originally we had used Windows 2000 server running IIS 5. Now the system successfully has been migrated to Windows 2003 server running IIS 6.

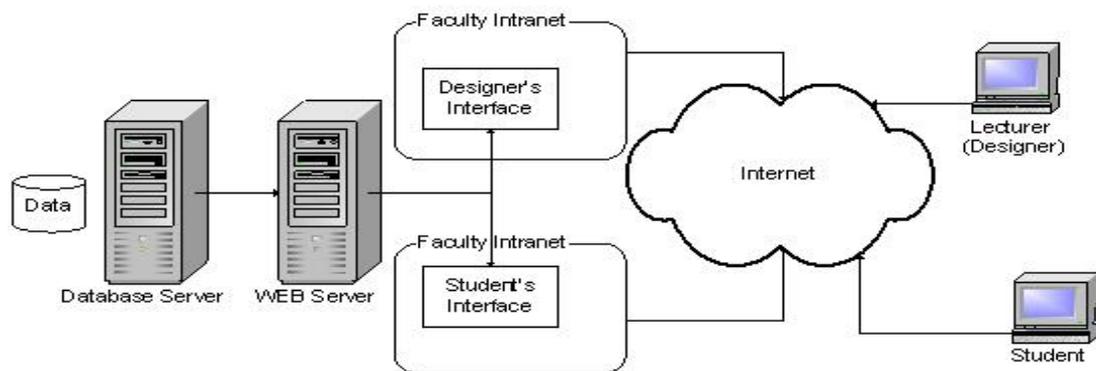


Figure 4. InterLearning System Architecture

Students' Evaluation of the WebCT and InterLearning Environments

WebCT and InterLearning were evaluated by the students during the 2002-2203 (WebCT) and 2003-2204 (InterLearning) academic years by two different groups of 50 students of the COMP-153 Visual Basic course. The students were exposed to the system halfway through the semester. They were asked to rate the WebCT and InterLearning software and the supporting teaching/learning functions through a questionnaire, using a scale from 0 to 4 (0 being the lowest value, 4 being the highest value). They were also asked to indicate how the on-line material had affected their studies. The charts presented herein (Figures 5 – 7) summarize the students' responses. The charts summarize the two basic findings of the survey, namely:

1. There was no great difference between the evaluation/assessment feedback of WebCT and InterLearning.
2. Students were generally very satisfied from the environment, functions and the impact of the software on their studies.

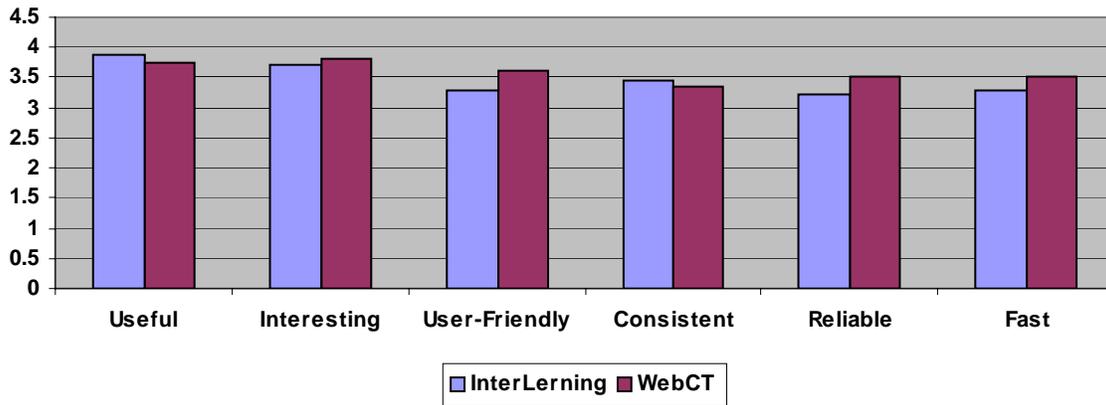


Figure 5. The InterLearning and WebCT Environments – Students' Evaluation

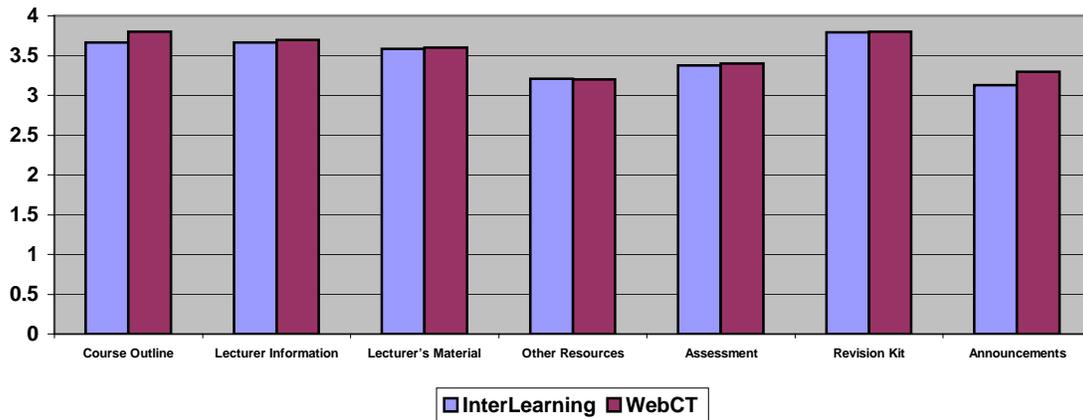


Figure 6. The InterLearning and WebCT Supporting Tools – Students' Evaluation

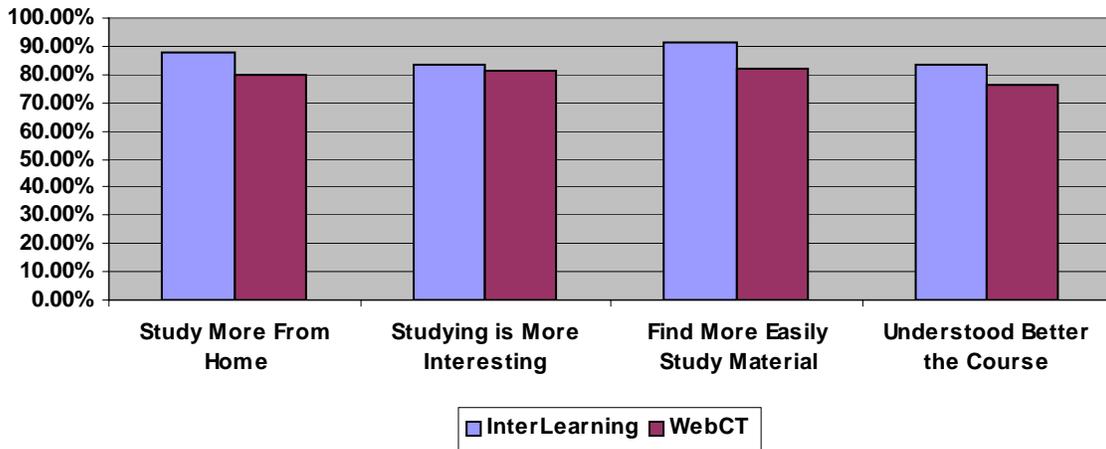


Figure 7. InterLearning and WebCT effectiveness on Student Studies

Lecturers' Evaluation of the InterLearning Environment

The lecturers who used the InterLearning system were also asked to provide evaluation feedback. A similar questionnaire to the one used for students was used, with the same scale of values. Lecturers were asked to evaluate, similarly to students, the InterLearning environment and the provided functions. Also, lecturers were asked to identify additional useful functions. As shown in Figure 8, lecturers were generally happy with the InterLearning environment, rating most of its aspects very good – the average rating being 3.6 (out of 4).

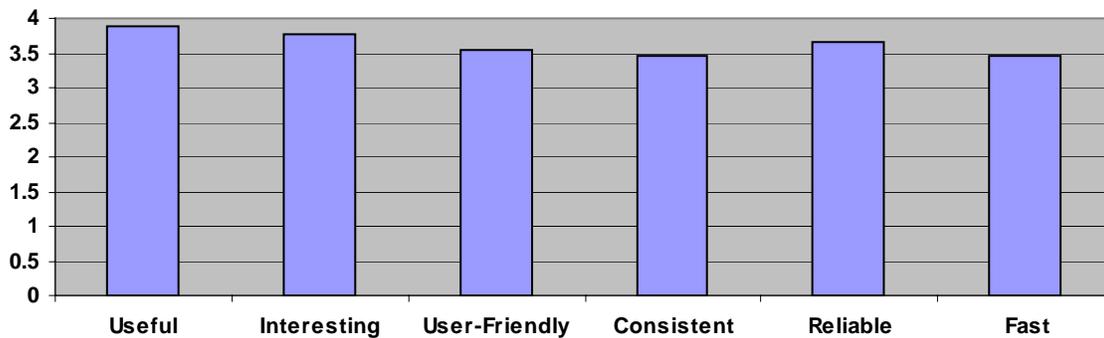


Figure 8. The InterLearning Environment – Lecturers' Evaluation

Figure 9 presents the lecturers' opinion with regards to the usefulness of the provided functions to the students. It is very interesting to compare Figure 9 with Figure 6 that shows the students' evaluation of the provided functions and see the similarity in the scores of both the lecturers and the students.

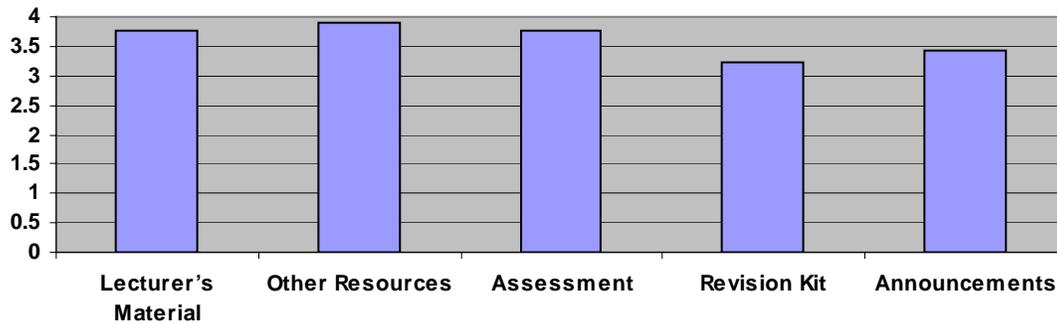


Figure 9. The InterLearning Supporting Functions – Lecturers' Evaluation

Figure 10 presents the percentages of the lecturers who believe that some additional functions are required for improving the system.

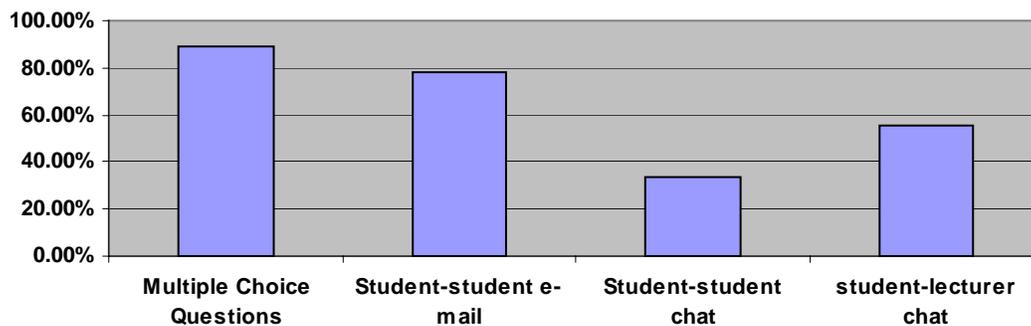


Figure 10. New Functions Required – Lecturers' Evaluation

Conclusion

In this paper we have presented the evaluation of the InterLearning and the WebCT software and the impact that educational software and on-line teaching and learning has on our students. We obtained feedback both from the students and the lecturers. We were able to obtain feedback from the lecturers only for the InterLearning software since very few lecturers are familiar with WebCT. The evaluation was carried out through the use of questionnaires and the results were summarized and presented through the use of graphs. Considering the two software packages there was no real difference in the students' feedback. The main outcome of our statistical analysis of the students' feedback is that, in general, the provision of supporting on-line material benefited the students. The main conclusion of our statistical analysis of the lecturers' feedback

is that there is a need to enhance the InterLearning software to include multiple-choice questions/tests functionality. We are actually in the process of doing so.

Based on our conclusions, our recommendation for the College is to adopt InterLearning as the main software environment for building Intercollege's Web-Based Teaching and Learning Environment (IWBTLE). We stress out again that at the moment IWBTLE's main function is to provide educational support to traditional teaching and learning. The enhanced InterLearning software is deemed to be adequate as a development platform. Of course WebCT is a more complete educational software, definitely better for supporting open learning distance education that replaces traditional teaching. Intercollege is currently in the process of making its first steps (through the newly established Distance Learning Office) towards this direction. The InterLearning software cannot be used for this purpose unless it is enhanced with student monitoring and other functions supported by WebCT. Thus, our current and future work involves the development of new functionality into InterLearning that will provide the platform for the IWBTLE to support open learning distance education.

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