Evaluation of E-Learning Courses

Duro Njavro¹, Mirna Korican², Karmela Aleksic-Maslac³

Abstract - With growth of using the Internet, more and more faculty are using e-learning as a new way for education. Although e-learning can be a useful tool in education, we need to look at it from the student perspective. To discover how much students are satisfied with courses that are half thought classically and half through usage of distance learning model, Zagreb School of Economics and Management is conducting on-line research after each semester. Students are filling on-line questionnaires for each course they take in current semester, and one questionnaire which discovers global satisfaction with the faculty staff and faculty in global. Results show that usage of e-learning has impact on student perception of usefulness and satisfaction with course taken.

Index Terms - distance learning, e-learning, student satisfaction

INTRODUCTION

Zagreb School of Economics and Management (ZSEM) was established in 2002. We were fortunate to be able to utilize all the advantages of implementation of information and communication technologies (ICT) into education from the start [1]-[7]. The very idea of introducing e-learning as an integral part of the educational process has originated from the management at ZSEM. All ZSEM faculty must, in addition to conducting traditional classes, prepare their course in the form of e-learning [8]. Currently, around 700 students are enrolled at ZSEM, and we have about 50 courses developed on the WebCT [9]. The Zagreb School of Economics and Management is currently the only higher education institution in Croatia using e-learning systematically - in each and every course [10]. For our LMS (Learning Management System) we have chosen the WebCT courseware tool [11].

At the beginning of each semester faculty and teachers undergo WebCT training – students as users, faculty as designers. The E-learning group offers guidelines to the teachers on what should each course contain: the Syllabus, Lectures, Exercises, On-line Quizzes, the Calendar, E-mail, the Forum, etc. However, the teachers are free to design their course pages in such a way as to best suit the specifics of each course [1]. We can group all on-line courses into 3 categories, according to the quality of their WebCT pages: advanced – 40%, intermediate – 45%, and elementary – 15%. Our goal is to ensure that the second and third category courses improve by one level, and that eventually all our courses belong to the first category.

Figure 1 shows the E-Learning Management System (ELMS) at ZSEM [10]. Each year coordinator has student access to the courses taught during that year, and ensures that the student-teacher communication through WebCT is regular, and that the information on the web is current. E-learning experts carry out an evaluation of the e-learning courses twice a year. In addition to that, at the end of each semester we have regular student evaluations of each course. The data gathered through this evaluation is used by teachers as feedback for improvement of their courses.

FIGURE 1
THE E-LEARNING MANAGEMENT SYSTEM AT ZSEM

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The 2nd Chapter will discuss the monitoring of student satisfaction, the switch from paper-based to on-line evaluation surveys, and the opportunities for on-line evaluation offered by WebCT. The 3rd Chapter will set our hypothesis, the 4th will present the results, and the conclusions will be brought out in the 5th Chapter.

**MONITORING STUDENT SATISFACTION**

Although the Zagreb School of Economic and Management (ZSEM) has been using WebCT since the very beginning, the student satisfaction testing was implemented only after the first year.

After the first semester in the 2003/2004 academic year, a survey was conducted testing the students' satisfaction with courses and teachers. A survey testing the overall satisfaction with the School was included in the study. Two generations of students were tested. Both surveys, however, were implemented in a paper-based form, which made timely evaluation difficult. Researchers working on the study had to interrupt classes during the last week of school to administer the surveys, and students complained about having to fill out up to 6 course surveys, followed by at least as many teacher surveys, and the overall satisfaction survey, all in one week. In addition to that, the number of generations to be tested increased the following academic year, increasing the total number of students.

We first implemented WebCT-based student evaluations in the 2004/2005 academic year (Figure 2). This made the testing process shorter and considerably less complex.

To make the process as easy as possible for the students several changes were made. The number of questions was decreased, and the deadline for filling out surveys extended. In each semester, the evaluations begin three weeks before the end of semester, and end the last week of class. Within each of the courses a student is taking, questionnaires for course satisfaction, teacher satisfaction, and assistant satisfaction (if applicable) are given (Figure 3).
WebCT evaluations shorten the process of analyzing data and comparing results for different courses, teachers and assistants, since WebCT can automatically calculate basic statistical data. In just a few steps, it offers the arithmetical middle, mean, mode, and standard deviation. It also generates a data base for each questionnaire, which can be downloaded and used for more complex statistical operations (Figure 5).

At the end of the semester only a few days are needed to download all the data off the course pages and the overall-satisfaction page, which makes it possible to make presentations that rank courses, teachers, assistants, and the overall satisfaction for each academic year in a very short time. This data is presented to the faculty during the last faculty meeting of the semester, distributed to them by email, and placed on the faculty web page. The students also have access to the data through the student web page, in order to preserve transparency of the entire process.

Although WebCT-based evaluations were originally undertaken as a one-semester project, the students' response to and satisfaction with this type of evaluation was considerable. The faculty were also satisfied with the easy access they had to the data about their courses. Using WebCT proved a winning strategy for the administration as well, since WebCT can automatically calculate basic hypotheses.

There is a statistically significant correlation between the students' frequency of using the WebCT, the satisfaction with the communication with the teacher over the WebCT, and the overall satisfaction with the course and the usefulness of the course.

The results show a statistically significant correlation between the frequency of use of WebCT and other units that were tests between the Freshmen, Sophomores, Juniors, and Seniors.

To test our hypotheses, we used the data from the 2004/2005 and 2005/2006 evaluations. All obligatory courses were included in the analysis, and the response rate was over 40% of the students who took the course.

The first hypothesis was tested with correlation coefficients for 20 obligatory courses from all four years of study (Table 1). The responses were marked on the Likert Scale, with 1 showing the least satisfaction and 5 the highest satisfaction (e.g. for the variable “How interesting is the course taken.” response 1 means “not interesting at all”, while response 5 means “very interesting”).

The results show a statistically significant correlation between frequent use of the Internet and the usefulness and interest of the course. The statistically significant correlation between satisfaction with the communication with the teachers (through email or over the forum) and the usefulness and interest of the course has also been proven.

In other words, the students who use the WebCT more frequently and who are satisfied with the teacher's speed in answering their email messages, also find the course more interesting and useful than those students who use the WebCT less frequently. The use of WebCT as an e-learning tool, therefore, contributes positively to the students' perceptions of the usefulness and interest, and increases the quality of education. The combination of traditional teaching with the web-based course evaluations is a good strategy for the administration as well, since WebCT can automatically calculate basic hypotheses.

### Table 1: Correlation Coefficients

<table>
<thead>
<tr>
<th></th>
<th>Interesting (course)</th>
<th>Usefulness (course)</th>
<th>Usage of WebCT</th>
<th>Communication via WebCT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interesting (course)</td>
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<td>.489*</td>
<td>.477*</td>
</tr>
<tr>
<td>Usefulness (course)</td>
<td>.647*</td>
<td>1</td>
<td>.706*</td>
<td>.469*</td>
</tr>
<tr>
<td>Usage of WebCT</td>
<td>.489*</td>
<td>.706*</td>
<td>1</td>
<td>.853*</td>
</tr>
<tr>
<td>Communication via WebCT</td>
<td>.477*</td>
<td>.469*</td>
<td>.853*</td>
<td>1</td>
</tr>
</tbody>
</table>

* correlation is significant at the 0.01 level

### Discussion

The results show a statistically significant correlation between frequent use of the Internet and the usefulness and interest of the course. The statistically significant correlation between satisfaction with the communication with the teachers (through email or over the forum) and the usefulness and interest of the course has also been proven.

Statistics I is taught Freshmen year, and Statistics II Sophomore year.

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more modern way of transferring knowledge through distance learning has shown to be effective.

These results are consistent with the results of a similar research conducted at New Jersey Institute of Technology [12]. The study included 75 courses taught in spring 2003 (majority used WebCT) and 76 courses taught in fall 2003 (majority also used WebCT). Results of research showed positive correlation between instructor’s active communication with students and better course evaluation.

Some researches show that students are more satisfied with traditional face-to-face education. Students enrolled in online course of statistics were significantly less satisfied with the course than students that who were thought traditionally [13,14].

At ZSEM we are combining traditional and modern ways of education to achieve student satisfaction and achieve their better results and better knowledge.

To find out whether there are any positive effects of the student feedback on the teachers, and whether the average evaluations of usefulness and interest of the courses are different, we used a paired sample t-test. All obligatory courses taught during the first three years of study were included in the analysis (n=18). The fourth year courses were not included in this study, as we did not have any fourth year students in the academic year 2004/2005. The hypothesis was that the feedback on the usefulness and interest of the course influences the teachers and the assistants, who systematically improve their work, which in turn results in the increased satisfaction of students with the course. The hypothesis was proven to be correct.

Compared with the previous year, the students from the first three years of study in the 2005/2006 academic year find their courses more interesting (t=2.076, p<0.05) and more useful (t=3.872, p<0.01) than the previous generation.

To test the hypothesis that the teachers use the experience gained in one course to teach other courses in the higher years, we used the One-Way Analysis of Variance (ANOVA). As we have already mentioned, teachers who teach courses on the first year of studies (which is now being carried out for the fourth time) or the second (carried out for the third time) often also teach third and fourth year courses (taught this year for the very first time).

The results show that there are no statistically significant differences between the first, second, third and fourth year courses in the listed characteristics. This means that the professors are carrying over their experience from the previous years into teaching the new higher-level courses.

### Table 2

<table>
<thead>
<tr>
<th>Paired Samples Statistics</th>
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<tr>
<td>Mean</td>
<td>N</td>
</tr>
<tr>
<td>Pair 1</td>
<td></td>
</tr>
<tr>
<td>V0405</td>
<td>4.10</td>
</tr>
<tr>
<td>V0506</td>
<td>4.41</td>
</tr>
</tbody>
</table>

* t-test 2.076 (p<0.05)

### Table 3

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<tbody>
<tr>
<td>Mean</td>
<td>N</td>
</tr>
<tr>
<td>Pair 1</td>
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</tr>
<tr>
<td>V0405</td>
<td>3.76</td>
</tr>
<tr>
<td>V0506</td>
<td>3.98</td>
</tr>
</tbody>
</table>

* t-test 3.872 (p<0.01)

The results show that there is a positive effect of the student feedback on the faculty, and that within a year a statistically significant improvement was reached. We expect that the student satisfaction will not increase significantly anymore, but will reach a certain high level at which it will stagnate, with insignificant variations.

### Conclusion

The results of the study show:

- The students who use the WebCT as a study tool more frequently and who are satisfied with the teacher's communication over the WebCT, also find the course more interesting and useful than those students who use the WebCT less frequently and who are less satisfied with the communication over the WebCT.
- The evaluations taken at two different time periods are different, with the results for the 2005/2006 academic year being higher than the results from 2004/2005. The results point to the possible improvement in the quality of courses due to the experience and the student feedback from the evaluations.
- There are no statistically significant differences in the evaluation of the interest, usefulness of the course, the frequency of use of the course and other tested characteristics between the four generations during the winter 2005 semester. The teachers who teach lower level and higher level courses are carrying over the experience, knowledge, and abilities they gained through teaching lower level courses into their teaching of higher level courses.
- This is merely a beginning of a large project, which, we expect, will improve the education process at ZSEM.
REFERENCES


