

Assessing a case of Web use for face to face teaching support

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Abstract

The paper presents a study of the impact that the use of Web pages can have in supporting the author's face to face teaching. The author's Web pages have been in use since 1995 evolving from being used in 12 different disciplines from graduate and post graduate studies, covering 1200 students. The main goal is to assess both the impact and the use of Web pages as a complement for face to face teaching by measuring three student related items: computer use, Internet use and the use of the class Web pages taking into consideration a particular class.

The class was Information Systems, who provides an introduction to the subject and it is offered to a wider number of majors, providing students with different backgrounds. A questionnaire has been used, covering two editions of an Information System class in two consecutive editions in the academic year of 2000/01.

Based on data analysis, a conclusion has been reached: the class Web pages were considered as an effective help by students, regardless of their skills and usage patterns, both with computers and Internet.

Keywords : ICT for education, Web based education, face to face teaching

Introduction

Face to face teaching and Web pages

Using Information and Communication Technologies (ICT) is a growing trend in supporting education activities. Factors as the cost of Internet use and cost of computers may have some influence. In particular, the World Wide Web (Web) allows a growing number of new users and the widespread of accessing a huge amount of available information in a multimedia format, but without structure.

Although its lack of structure, the Web has some potential for education. We can take advantage of its characteristics as a complement to face to face teaching by offering structured information to be explored by students. The author's experience both with the lecturing of an Information System class and the use of Web pages is used to foster knowledge transmission, using a strategy of face-to-face classes and offering related content within the context of the class in Web format. Both the class and the Web pages were started in November 1996, but just the data from the academic year of 2000/2001 was considered for this study.

This study only attempts to deal with the use of Web pages as a complement to face to face teaching outside the classroom and as a non-oriented activity. Other approaches are possible as the use of Web facilities within the classroom [Gouveia, 1998a].

The university has a particular environment concerning the use of the Internet and how students can access to Internet/Intranet services. A laptop project has been started in 1996, providing each newcomer student a laptop computer as day to day tool. The university itself provide class rooms, labs and other social spaces with Internet connection facilities to support the use of these laptops to access Internet and local university information as described in [Gouveia, 1998].

Study context

The Information System class although it is an information technology related subject is biased to a wider audience. Most of the topics in the class deal with technology description, concepts based in lectures. A number of texts, references, case studies and exercises are made available on-line.

This paper follows the discussion about face to face teaching provided in [Gouveia, 1999a], where the role of Internet services has been discussed and a framework for its adoption proposed.

Motivation

The effort to develop, design and maintain Web pages is huge. Usually, this effort begins by developing proper contents and formatting them to be used in the Web. Among some of the requirements are the need to consider intellectual and property rights, documents size (both in Bytes and printed pages), documents readability on-line of just in press, and the need to consider the structure and organisation of the information.

As defended in [Gouveia, 1998b], the teacher role still most of the times centred in facilitating students learning and its “life performance”, instead of being a content creator. In fact, content creation, is the least important characteristic in classroom from the three ones listed?

This way, using Web pages as a complement to face to face teaching can be seen as a creative component of the teacher work. This study intends to know how students consider the Web pages as a complement to attend lectures in the Information Systems class.

Methodology

Problem

Study how Information System students use the computer, the Internet and the class Web pages. In particular, what are the limits to the use of Web pages as a complement to face to face teaching?

Hypothesis and study variables

Considering the particular environment of the Information System class and the Fernando Pessoa University where a laptop project has been in place, the following hypotheses are placed:

- ? Do computer use skills have some relation with the use of the class Web pages?
- ? Do the Internet skills have some relation with the use of the class Web pages?

The class Web pages are available to be accessed in the following URL: <http://www.ufp.pt/~lmbg>. Their structure and description is made in [Gouveia, 1999]. The laptop project is presented in detail by [Gouveia, 1996] and its impact discussed in [Gouveia, 1998].

Data gathering

To gather the data for this study, a questionnaire has been used in the classroom. Each student has ten minutes to answer 31 questions regarding skills on computer and Internet use, and how they use the class Web pages.

The students belong to three different majors: Management, Engineering and Communication Sciences. The collected questionnaires result in random student selection because their distribution takes place once for each major and just the students who were present have answered them. The following table summarises the sample size and the collected answers considering the three majors and the total.

| class | Total number of students | Collected questionnaires | Sample percentage |
|------------------------|--------------------------|--------------------------|-------------------|
| Management | 29 | 10 | 34,48% |
| Engineering | 55 | 28 | 50,91% |
| Communication sciences | 83 | 36 | 43,37% |
| total | 167 | 74 | 44,31% |

Table 1: study population and sample

The questionnaire has 31 questions covering the three skills involved in the study: *computer use*, *Internet use*, and *class Web pages use*. A constant scale has been used with five positions with both its construction and the construction of the questions following guidelines proposed by [Cohen et al., 2000].

Data analysis

Considering the need to analyse the skills related with computer and Internet use, a number of statistical tests have been made to relate these skills with the amount of money spent on computer and Internet use. The analysis considered a group for each of the majors (Management, Engineering, and Communication Sciences) and all the students together.

Considering the *computer use* skill and taking into account the time spent on it, the following observations can be made:

- ? **All the sample:** the time spent using computers is better explained by how much time is used with a spreadsheet. In particular, the more time students spend in using a spreadsheet, the more time they spend using the computer;

- ? **Management:** the time spends using computers is better explained with computer games and a presentation program. In particular, the more time Management students spend using computer games and a presentation program, the more time they likely use computers;
- ? **Engineering:** the time spends using computers is better explained by the use of a spreadsheet and a word processor. In particular, students using spreadsheet and a word processor are likely to use more computers;
- ? **Communication Sciences:** the time spends using computers is better explained with the use of computer games. In particular, students using computer games are likely to use more computers;

Concerning the *computer use*, each different major seems to use computers in different ways. Students from Communication Sciences spend their time with computers mainly with computer games while Engineering take advantage of common tools when using computers as the case of word processor and spreadsheet. In the case of Management students, their computer use includes both computer games and a presentation program.

Overall, the Engineering major influences the entire sample, as the most used tool is the spreadsheet. These results may show that the knowledge area that each major reflects may influence the use of both the tools and the time spend with computers.

Taking into consideration the *Internet use*, the week time that students spend on it has been cross-referenced with student answers.

- ? **All the sample:** the time spent with Internet is partial explained by the frequent use of the World Wide Web. That means students who use the Web frequently, spends more time using the Internet;
- ? **Management:** the time spent with Internet is better explained by the use of the World Wide Web and FTP. That means students who use the Web and FTP frequently spends more time using the Internet;
- ? **Engineering:** the time spent with Internet is better explained by use of News and somewhat explained by the use of the World Wide Web. That means students who use News and sometimes the Web spends more time using the Internet;
- ? **Communication Sciences:** time spent with Internet é somewhat explained with the use of file transfer (FTP). That means students who use FTP sometimes spends more time using the Internet;

Concerning the *Internet use*, each major presents a different user profile. Students from Communication Sciences, spend their time in Internet using any of the traditional Internet services (Web, email, FTP, IRC, and News), but those who use FTP seem to spend more time on Internet, mostly for download information. Engineering students that spend more time in Internet, use News taking advantage of special interest groups and discussion groups on subjects related with their interests. Management students take intensive use of both the Web and FTP. Those students, who browse and download information from the Internet, are the

people who spend more time using the Internet. Overall, the use of the Web seems to be the preferred activity of who spends more time using the Internet.

Regarding the question of *how useful are the class Web pages*, the following observation can be done:

- ? **All the sample:** class Web pages utility is strongly related with getting information and the class Web pages. There is also a strong correlation with computer use;
- ? **Management:** class Web pages utility is related with getting information, the Web page, in particular the *communications directory* and the *student information* options;
- ? **Engineering:** class Web pages utility is related with the facility to print available information;
- ? **Communication Sciences:** class Web pages utility has a small relation with the class Web pages;

This seems that the need to attend the classes and be successful acts as the main motivation. Overall, students use the class Web pages for getting information, although each major finds its own utility as the information availability in the case of Management; the opportunity to print it, for Engineering; and, again, the needs resulting from attending the classes, for Communication Sciences.

Taking into account student *interest in the class Web pages*, the following observations are made:

- ? **All the sample:** the class Web pages interest is strongly related with getting information from these pages;
- ? **Management:** the class Web pages interest is related with the class Web pages and the *student information* option;
- ? **Engineering:** the class Web pages interest is related the Web pages and the possibility to print available information;
- ? **Communication Sciences:** the class Web pages interest has a small relation with both accessing and printing the information;

When asked about the interest that the class Web pages may have, students produced an overall answer that their main interest is to provide information about the class. This may suggest that a top requirement when considering the development of Web pages to support presential teaching must be made them informative. However, each major stresses different aspect, as the *student information* option, for Management; the possibility to print information, for Engineering; and the class Web pages existence, for Communication Sciences.

Also of interest is the similarity of answers between utility and interest of class Web pages. The main difference is given by a strong correlation of utility and computer use, what may suggest that although utility and interest are similar, students who use more computers, tend to found the class Web pages more useful.

Further remarks

Taking into account gathered data a number of variable correlation's have been made:

- ? a medium correlation between time spent with computers and its usage frequency has been found;
- ? it has not been found any correlation between the time spent with computers and time of use laptop computers;
- ? it has not been found any correlation between the time spent with the Internet and the number of Web access being made;
- ? It has been found a strong correlation between class Web pages utility and its interest for the students.

Considering the studied population, it seems that to a greater use do not correspond greater time of effective work. This seems not so visible concerning computer use when compared with the Internet use.

Considering computer and Internet use, it is possible to say that both skills and usage seems to be different according needs of each of the majors considered. Based on that, we can advance that a strategy to explore class Web pages may need to take into account the major and interest of each group of students otherwise we can loose their motivation by not considering particular characteristics of each major.

Now we can restate the study hypothesis:

- ? Do computer use skills have some relation with the use of the class Web pages?
Not as direct as it may be expected. This means that to greater skill degrees of computer use does not necessarily corresponds a greater Web pages use.
- ? Do the Internet skills have some relation with the use of the class Web pages?
Yes, but these skills are less important than the interest and motivation for the information available on these pages. The content seems to be more important for each group selection of Web pages use.

Final remarks

Conclusion

Although without reporting all the information available from conducting the present study, some insight can be found concerning the role that class Web pages may have in complementing face to face teaching. In particular, there is a clear advantage concerning the offering of additional content and allowing student access to available information.

Based on the study is possible to say that students feel as positive the existence of Web pages for the Information Systems class, regardless of their skills and usage patterns concerning computers and Internet.

In particular, three main considerations can be stated as relevant when developing Web pages to support presential teaching:

- ? Consider that the user profile and its knowledge background may influence computer and Internet use, as the proposed Web pages;
- ? Develop the Web pages the more informative as possible;
- ? Students with different computer and Internet skills may regard web pages utility in different ways.

New questions to be made

This study besides the contribution to inform the requirements to develop Web pages to support presential teaching and provide additional observations that need further study. Among these questions, are:

- ? Can the interest to use class Web pages (who seems to be related with computer and Internet use) indicate also that those students are able to take more advantage of these pages?
- ? Can we propose user profiles for proposing the “best fit” Internet services?
- ? Can we define such user profiles based on different major needs?
- ? Can the results from this study be used in other contexts than the one created by the laptop for project?
- ? Would it help to analyse data from use the class Web pages, as page hits, time to connect, download statistics and other usage data?

Overall, reported results must and can be confirmed by repeating the questionnaires again for students from each new academic year. This way, better knowledge can be obtained to confirm both gathered data and proposed answers as provide new clues to deal with questions that remain to be answered from this study.

Also, a number of questions can be placed as the case of students that do not attend classes. These students may have an interesting use of the class Web pages and may use them as substitutes for attending classes. Clearly, further research need to be conducted even to know if Web pages can have other implications not just to complement face to face teaching but to alter it.

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