

# The affect of lecturers' attitude on students' use of an online learning environment

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## ABSTRACT

There has been a dramatic increase in the development of technology-based learning and teaching. Large number of educational institutes are now offering web-based courses. In order to satisfy the needs of these organizations many tools have been developed such as: WebCT and blackboard. The increased use of technology in the teaching and learning process has highlighted the importance of understanding how these technologies improve the learning process. Research in this area is way behind the increase of activity in practice. This study investigates how instructors' attitude toward using WebCT affects students' satisfaction and performance on a web-based course. 131 students from Brunel University participated in this study. Their performance on two WebCT-based modules (referred to as module A and module B in this paper) were observed. A five point Likert scale was used to measure students' attitude toward WebCT for each module. Statistical data about students' activities on WebCT was collected from the WebCT tracking system. Results suggest that lecturers' attitudes towards using WebCT have an impact on students' attitudes to WebCT. Moreover the results show that the lecturers' method of using WebCT also affected students' activities on WebCT. The results of this study suggest more research should be undertaken on the impact of instructional behaviour on students' learning process on web enhanced courses.

## Keywords

Web-enhanced course; WebCT; instructor attitude; students' attitude; achievement.

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## INTRODUCTION

Most of the universities in the UK are using technology to develop courses that meet students' educational needs and goals (O'Neil et al., 2004). Alavi and Leidner (2001) stated that technology features can enhance learning outcomes by facilitating efficient delivery of instructional strategies and by supporting certain activities such as cognitive problem-solving and decision-making processes of the learner. They suggest that the technology-mediated-learning research question should be shifted from "Does technology influence learning?" to "How can technology enhance learning?"

Universities are implementing different types of technology-supported learning. This study will focus on web-enhanced courses only. Web-enhanced courses are traditional face-to-face courses which include web-related materials. Web-enhanced courses usually adopt a course management system (e.g. WebCT) (Sivo et al, 2007). WebCT (Web Course Tools) was developed by Murray Golderg, a faculty member at the University of British Columbia (Burgess, 2003; Volery and Lord, 2000). It is an integrated set of educational and management tools which is specifically used for the design and development of teaching and learning materials.

Lu, Yu, Liu (2003) stated that web course tools (WebCT) are becoming an important information system application for higher education. WebCT is believed to support development of problem-solving and critical thinking. However, the literature indicates that there is little research to explore the learning effectiveness of using WebCT. Learning effectiveness has been measured in terms of students' performance and satisfaction. A number of studies have been conducted to identify the effectiveness of WebCT as a learning tool, the impact of different styles and patterns in online settings, and the impact of student demographics.

Studies have shown that using technology in learning can positively affect students' learning process. Several studies explored the effect of course management

software systems on student performance and attitude. Jones and Jones (2005) assessed the perceived effectiveness of the web course tools "CourseInfo", now known as WebCT, implemented at a regional Midwestern U.S. university. They found that both students and faculty have positive attitudes towards CourseInfo. There was general agreement among students and faculty members that the Web is a beneficial educational tool. Moreover, students and faculty highly agreed that CourseInfo specifically is a beneficial educational tool which improves student learning. Regarding the communication through CourseInfo tools, students did not think that CourseInfo facilitated student-to-student communication while faculty did. Also, faculty agreed more than students that CourseInfo facilitated faculty-student communication. Hammoud et al. (2008) studied students' attitude and achievement in relation to their use of WebCT. They found a positive relationship between students' way of using different tools within WebCT and their academic achievement. Students valued WebCT's flexibility and the possibility of answering their questions anytime. The module leader valued WebCT as a supporting tool to traditional face-to-face learning but not as an effective tool on students' learning. The quality of delivered material through WebCT was found to affect students' learning.

Understanding what factors influence students' satisfaction with a course is a significant step toward the development of successful courses (Kim and Moore, 2005). Kim and Morre investigated how students' characteristics and behaviour affect their satisfaction and learning experience within web-based courses. In their study students' interactions with each other and with their instructor were found to have an impact on students' satisfaction with web-based courses. Arbaugh (2002) used an MBA course to examine the effects of the technology used to deliver web-based courses on students learning and satisfaction. He found a positive relationship between the interaction during the course and the students learning and satisfaction. Moreover, he suggested that the instructor may have an indirect influence on the interaction in a web-based course. Instructor behaviour in the class may encourage the student to interact more using the web-based communication tools (such as the discussion board). He suggested that the instructor as facilitator is significant for the success of a web-based course and said that instructor experience should still be considered in future studies. Studies found a positive relationship between students' use of the communication board within WebCT and their achievement (Hammoud et al., 2008; Hoskins and Hooff, 2005). Hoskins and Hooff (2005) stated that it was extremely promising to find that the use of dialogue can influence the students' achievement in assessed coursework. Students' satisfaction with their web-based course is very important for the success of the course. Howland and Moore (2002) found that students with positive attitudes toward their web-based

course experience were more able to understand the course content and trust self-assessment of their learning than students with negative attitudes. Moreover, students with positive attitude toward web-based courses reported the need for less guidance than students with negative attitude. They stated also that students' performance and strategies in an online course was influenced by their expectations of the course.

Fewer studies have assessed teachers' attitudes towards the effectiveness of course management software. Sun et al. (2008) investigated critical factors affecting learner satisfaction on web-based courses. In their study Sun et al. developed an integrated model with six dimensions: learners, instructors, courses, technology, design, and environment. One of the factors they studied is instructors' attitudes towards e-learning. They stated that instructors' attitudes toward e-Learning have a significant effect on e-Learners' satisfaction. It was found that instructors' attitudes in handling learning activities affect the learner satisfaction toward these learning activities. For example, a less enthusiastic instructor or one with a negative view of e-Learning education shall not expect to have students with high satisfaction or motivation. As the students' performance will be affected by the online instructor attitude toward e-learning, institutions should select instructors carefully.

Mazza and Dimitrova (2004) highlighted the importance of the log file data generated by course management systems. This data can be used to help the instructors become aware of their students performance in an online course. They stated that monitoring the students learning is an essential component of high quality education. WebCT log file data was found to be useful for instructors to quickly and more accurately grasp information about social, cognitive, and behavioural aspects of students. This information was provided in graphical representation which found to be helpful in identifying early problems with distance learning and prevent them.

#### **PURPOSE OF THE STUDY**

Many of the studies presented in the previous section were conducted to examine the learning effectiveness of using WebCT the students' attitudes towards web-based courses and what affect their satisfaction in such courses. In general, these studies found that students and instructors have positive attitudes towards using web-based tools in their courses. Furthermore, they found a relationship between students' performance and attitude.

The current study will investigate the relationship between the students' attitudes towards using WebCT and their module leaders' attitudes towards it. Additionally, the relationship between students' use of WebCT, their performance, and their attitudes towards WebCT will be investigated in relation to their modules leaders' attitudes towards WebCT.

Generally, the purpose of this study is to examine students' attitude, performance and achievement on a web-enhanced course in relation to their modules leaders' satisfaction toward web-enhanced courses and their method of using it.

## RESEARCH METHODS

The study was conducted at Brunel University, UK. All undergraduate and taught postgraduate courses delivered by the School of Information Systems, Computing and Mathematics at Brunel University are supported by WebCT.

### Participants

131 students and two modules leaders from the department of information systems, computing and mathematics participated at this study. All the students were level two undergraduates studying on the same course. The modules leaders were the lecturers for two of the modules on the students' course. 29 of the students completed the attitude questionnaire for the two observed modules.

### Data collection instruments

A mixture of qualitative and quantitative methods was used in this study.

Information on students' use of WebCT throughout term time was obtained from the tracking system. The tracking system provides information on how many times each student visited each page in WebCT and how much time they spent exploring it. Moreover, the modules leaders' approaches to using WebCT were explored by monitoring the web pages of their modules. These observations provided information about how they designed their modules, which tools they used, and how often they answered the students' questions.

One of the study's objectives was also to compare students' attitudes towards WebCT and the module leader's method of using it in each module. To measure students' attitude, a five point Likert scale was used in the questionnaire. Students were asked to respond to seventeen statements on a five-point scale ranging from strongly disagrees to strongly agree. In addition, the questionnaire contained four open-ended questions aimed at collecting information on the following areas:

- Students' problems when using WebCT.
- Students' thoughts on the module leader's method of managing the module through WebCT.
- The extent to which students felt they were in control of their learning using WebCT.

In order to obtain comparative data between the two modules, the students were asked to complete the same questionnaire twice. In each case, students were asked to answer depending on their learning experience on a specific module.

### Procedure

At the beginning of the second semester in the academic year 2006-2007 two module leaders' attitudes towards

using WebCT on their courses were measured. Statistical data about students' use of WebCT was collected weekly. The statistical data was mainly numbers giving information about how many times each student visited the web page for a module. Moreover, it provided records about how many times a student read or posted on the communication board. Also, it gave information about how many times they visited each page within a module and how much time they spent on them. The information was saved for each module separately in order to compare them later in the study. The questionnaire was submitted on paper to the students at the end of modules lectures before the exams.

### Data Analysis

Students' general uses of WebCT were measured by the number of times each student visited WebCT pages or used the discussion board for the observed modules. Students' achievement was measured by their grades. Students' attitudes towards WebCT were measured by using a Likert scale. The data was analysed by using SPSS software.

Frequency measures were used to analyse the numerical data which was obtained from the questionnaire.

A Paired Samples T-Test was run on students' attitudes towards each module to compare the means and to find out if the differences in means were significant.

The measures of students' academic achievement in the module were correlated (*Pearson's Product Moment Correlation Coefficient*) with the measures of WebCT use (e.g. WebCT hits and communication board use). The relationship between the students' achievements and their use of WebCT was also analysed.

The differences between students' approach of using WebCT for both modules were examined. In order to compare the means and to find out if the differences in means are significant, an ANOVA for repeated measures was carried out.

## RESULTS:

### Instructors behaviour

The modules leaders used WebCT similarly for both observed modules. Both of them used WebCT in a basic way. They published the lecture slides, past years' exams papers, study guides, and other resources. They did not use the available tools to design special material for the modules such as special quizzes or uploading topic specific videos. The only differences between their approaches were the use of the communication board and the difference in their attitude toward the use of WebCT. The communication board was used in module B from the beginning of the course and the module leader encouraged the students to use it. However, in module A it had not been used until the last three weeks of the term and the module leader did not follow the students' posts.

The modules leaders' opinions toward using WebCT in their courses were different. Module A leader had a

negative attitude toward using WebCT. He did not like the experience of using WebCT to support his course. Module B leader believed that WebCT was a very good tool to support the learning and teaching process in his course. The reason for these differences is that the first module leader used another system to support his course: his own specially designed website and he communicated with the students via email. He was familiar and experienced with using this system, therefore he dislike having to move to an unfamiliar new system and did not receive much training on how to use it. In contrast, with his own web pages he was in control of everything and could easily do whatever he wanted in terms of course material and the like. The second module leader did not have such previous experience so he appreciated the new system which he felt was easy to use and met his requirements.

**Questionnaire results**

*Attitude*

Table 1 shows means for responses to 17 statements on the attitude survey. 29 students responded to the

more positive attitude towards using WebCT on module B than on module A. In order to find out if the difference in means was significant, a paired t-test was carried out. The Paired Samples T-Test results were  $t(28) = 2.607$ ;  $p < 0.05$  which indicated that the students had a significantly more positive attitude toward WebCT use on module B than they had for module A.

The responses to the open-ended questions showed that the majority of the students did not have any technical problem using WebCT for both modules. Students did not need help to use WebCT. Furthermore, students stated that they were in control of their learning because of the flexibility of using WebCT anytime from any place. The only different response to the open-ended questions was regarding the communication board for module A. Students said that they prefer to have a communication board for each module.

*The results from the tracking system*

The results obtained from the tracking system indicated that students frequently used WebCT on the two modules. Students visited all the main pages such as:

Table 1: The means of students responses to the questionnaire statements

Statements	Module A	Module B
The module leader presented the material in an interesting and helpful manner on WebCT for this module	3.72	3.86
The discussion board was used effectively in this module	2.41	3.76
The fact that I had to use WebCT for this module is a source of annoyance to me	3.59	3.86
WebCT helped me to achieve the learning outcome for this module	3.79	4.10
The amount of time required for WebCT used in this module was excessive	3.21	3.14
Using WebCT in this module increased my opportunity to pass this module's coursework assessment	3.69	3.86
Using WebCT in this module kept my interest engaged in the subject	3.28	3.69
Using WebCT in this module helped me to learn the subject more quickly	3.45	3.83
Having to use WebCT in this module changed how I learn	3.10	3.38
WebCT made it difficult to know what was expected of me in this module	3.55	3.86
I would recommend that this module continue using WebCT	3.83	4.21
I would like to have more interaction with the leader of this module through WebCT	1.90	1.97
I would like to have more interaction with other students of this module through WebCT	1.90	2.34
I can pass the exam and do all the assignments for this module without using WebCT	1.90	2.21
I can pass the exam and do all the assignments for this module without attending the lectures	1.83	1.93
Sufficient online resources were available for this module	3.59	3.38
WebCT for this module was easy to use	4.07	4.10
Average	3.11	3.38

questionnaire for both modules. The students' responses to five point Likert scale questions were scaled from 1 (strongly disagree) to 5 (strongly agree) for positive statements and from 5 (strongly disagree) to 1 (strongly agree) for negative statements. The mean score obtained from the Likert questionnaire indicated students had a

home page, content page, organizer, assessment page, and communication board.

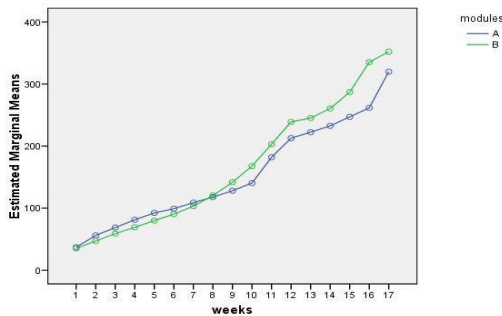
A paired t-test was carried out on the numbers of hits which represent students' total access to each module. The mean number of the students' hits representing the

students' total use of WebCT for module B (M= 356, SD= 233) was higher than the mean for module A (M= 329, SD= 193) resulting a mean difference (M= 27, SD= 111) in the number of hits per participant. The difference was statistically significant,  $t(131)= 2.831$ ,  $p=0.005$ , two tailed.

For clearer results an ANOVA for repeated measures was carried out on the numbers of hits which represent students' total access to each module per week.

The results showed that there was a significant difference between the means number of hits for modules A and B in thirteen weeks of the term. In the last nine weeks the mean numbers of the students' total use of WebCT for module B were significantly higher than the mean number of the students' total use of WebCT for module A. For four weeks (W2, W3, W4, & W5) the mean numbers of the students' total use of WebCT for module A were significantly higher than the mean number of the students' total use of WebCT for module B. The differences can be clearly seen in figure 1 below.

Figure 1: Difference between students' total access to WebCT for modules A & B divided into weeks (ANOVA,  $p<0.05$ )

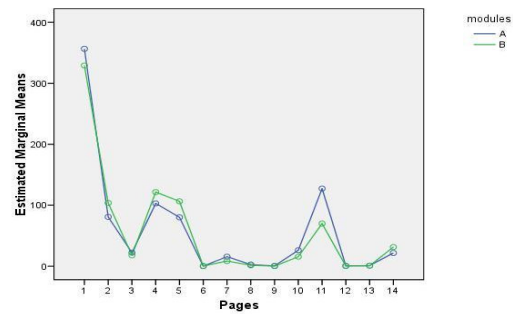


In order to explore these results in more detail, results of the total use of WebCT was divided into the students' visits to the following pages: home page, content page, organizer page, assignment page, communication board, quiz, calendar, and other. An ANOVA for repeated measures was carried out to examine the differences in the means of the hits number which represent the students' visits to each of these pages in each module.

The results showed that there are significant differences between the means of the hits numbers which represent the students' visits to each page. These differences showed a significant increase in the means of the

students' visits to home page and content page for module A. Also it showed significant increase in the means of the students' visits to the organizer page, the assignment page, quiz, and other for module B. Figure 2 below shows differences between the means of the hits numbers which represent the students' visits to each page.

Figure 2: Difference between of students' total access to WebCT for modules A & B classified by pages. (ANOVA,  $p<0.05$ )



(Page 1: Total access, 2: Home page, 3: Organizer, 4: Home and Organizer, 5: Content page, 6: Notes, 7: Assignments, 8: Quiz, 9: Calendar, 10: Other, 11: read messages, 12: post messages, 13: Follow up post, 14: Number of different pages visited)

#### Achievement

Table 2 shows the results of a paired t-test which was carried out on students' grades for both modules. The test was done to find out if the difference in means of students grades were significant. The results indicate that students' exam marks and final marks were significantly higher for module B than module A, while coursework marks were significantly higher for module A than B.

The relationship between the students' activities on WebCT and their achievement on each module were studied. Person correlations were carried out to find the relationship between the students' grades and their use of different pages of WebCT.

The terms "read", "post", and "follow up" refer to the use of the communication board. "read" is the number of messages each student read on the communication board. "post" is the number of messages each student post on the communication board. "follow up" is the

Table 2: summary of paired samples t-test measuring the differences between students' marks for modules A and B

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Coursework B_A	-2.191	10.001	.874	-3.920	-.462	-2.507	130	.013
Pair 2	Exam B_A	8.424	7.923	.692	7.054	9.793	12.169	130	.000
Pair 3	Overall grades B_A	8.065	13.174	1.151	5.788	10.342	7.007	130	.000

number of messages that student post in a discussion in the communication board.

A positive but weak significant correlation ( $r=0.39$ ,  $p<0.001$ ) was found between students' final grades, and "read" for module B. Also "read" was found to be significantly correlated with exam grades ( $r=0.348$ ,  $p<0.001$ ) and the coursework grades ( $r=0.294$ ,  $p=0.001$ ). A positive but weak significant correlation ( $r=0.237$ ,  $p=0.006$ ) was found between students' final grades, and "post" for module B. also "post" was found to be significantly correlated with exam grades ( $r=0.202$ ,  $p=0.021$ ) and the coursework grades ( $r=0.197$ ,  $p=0.024$ ). A positive but weak significant correlation ( $r=0.33$ ,  $p<0.001$ ) was found between students' final grades, and "follow up" for module B. also "follow up" was found to be significantly correlated with exam grades ( $r=0.251$ ,  $p=0.004$ ) and the coursework grades ( $r=0.33$ ,  $p<0.001$ ).

### DISCUSSION

All courses at Brunel University are supported by course management system (WebCT). Students participated in this study have had the traditional face-to-face lectures and labs. Also they have all the learning materials available on WebCT with a communication board to facilitate their interaction with each other and with their instructors. This study benefits from the tracking data on WebCT to calculate the students' actual use of WebCT and the instructors' method of presenting the learning materials on WebCT. The results of this study can be divided into two parts. First, there are findings related to students' attitudes, performance and achievement on web enhanced courses in general. Second, there are findings related to students' attitude, performance and achievement on web enhanced course in relation to their instructors' attitudes to WebCT.

The results showed that students had positive attitudes towards using WebCT as a web-based tool supporting their learning. In general they agreed with statements such as "WebCT helped me to achieve the learning outcome for this module", "WebCT for this module was easy to use". The students' satisfaction and appreciation of web-based course materials can be explained by their familiarity with the technology, and the flexibility of WebCT (i.e. it can be used anytime anyplace). One of the students commented: "I have used WebCT before so I don't need help to use it." The results of students' satisfaction and appreciation of web-based course can

be found in previous studies such as Arbaugh (2002) and Sun et al. (2008).

This study aimed to examine the effects of students' activities on WebCT on their achievement. To observe students actions on WebCT, this study used the numerical data from the tracking system log files. This data describes exactly how students performed on WebCT (how many time they accessed each page, how much time they spent, how many time they used the communication board, read or post, etc). Using the log files data is a strong approach in similar research. Log file data is essential to understand students' behaviour and performance on web-based course and to obtain information about how instructors should use WebCT to meet their students' needs (Mazza and Dimitrova, 2005). A positive correlation between students' activity on WebCT and their achievement. For example, there is a positive relationship between students' use of the communication board and their grades (exam and coursework). Moreover, there is positive relationship between students' total visits (and weekly visits) to different pages in WebCT and their grades. These results correspond to the findings of Hoskins and Hooff (2005) and Hammoud et al. (2008). It can be concluded that students who visited and spent more time on WebCT get better grades in the exam and the coursework. This result can be considered very important and promising.

Most of the students believed that they were in control of their learning. The availability of the modules' resources online allowed students to access the learning material anytime from anyplace which is on of the important factors affecting students' learning. One of the students comment: "I am in control of my learning because I can look at lecture slides to prepare for lectures." Another student stated: "WebCT refers to study guide for learning requirements to pass the module."

As the collected data for this study was from one group of students for two different modules, we could compare the students' attitudes and behaviour during the course. At the beginning of the semester students visited WebCT for both modules similarly. Then their visits varied until they started to visit WebCT pages for module B more than visiting WebCT pages for module A. The reason of this behaviour can not be explained by one cause. However, the significant differences in

students' attitudes towards WebCT and the modules leaders' way of using it can be considered an essential factor in this behaviour. Students had more positive attitudes towards module B than module A; that may explain that they preferred to visit WebCT for module B more than A. one module's leader negative attitudes to WebCT affected the students' attitude which may also caused less visits to WebCT of that module. This backs up the findings of Sun et al. (2008) who stated that instructors' attitudes toward e-learning have a significant effect on e-learners' satisfaction. In related research Mahdizadeh et al. (2008) studied factors influence teachers' use of different functions and capabilities of e-learning environments. Mahdizadeh et al. noted that teachers' perception of e-learning directly influence the actual use of e-learning environment. Module leaders' attitudes towards WebCT may have affected their way of using it. As stated in Mahdizadeh et al. (2008) teachers' attitudes and opinions about web-based learning activities are effective in shaping their attitude toward e-learning environment. Module leaders differ in their preference to communicate with students through WebCT. Module A did not have a communication board. The missing of the discussion board caused less student-to-student and student-to-instructor communications. So, the students did not have to access WebCT to ask of follow up questions. There is a strong connection between students' interaction and their satisfaction with a web-based course. Students who communicate well are more likely to have clear understanding of each other and learning materials and become more involved in learning (Kim and Moore, 2005).

Students' achievements were measured by their grades in coursework, exam and total grades. The students' exam marks and final marks were significantly higher for module B than module A, while the coursework marks were significantly higher for module A than for module B. These results are interesting however there is not enough evidence in this study on what caused these differences.

### CONCLUSION

Most of the universities in the UK are using course management tools to support their traditional face-to-face courses. WebCT is one of the important systems being used in higher education. The increase of using the WebCT emerges the need of research on how web enhanced courses influence learning. The relationship between the students' use of WebCT and their performance is significant and important. This study showed that students have positive attitudes towards using WebCT in their courses. Moreover, there is positive relationship between students' activities on WebCT and their achievement. Furthermore, this study concluded that the module leader way of using WebCT and their attitudes towards WebCT had affected the students' attitudes and performance. However, there is no strong evidence in this study to confirm that the

students' marks have been affected by their module leader way of using WebCT.

The results of this study suggest that instructors of web-enhanced courses should find methods to encourage students to use WebCT and to communicate through its communication board. Instructors may encourage students by providing feedback and observing students' communication and trying to answer their questions in a timely manner.

The study depended on the records of 131 students and on the 29 responses to a questionnaire. Also in this study only two modules were observed. Therefore, the study would have benefited from a larger sample population. The results of this study suggest more research should be undertaken on the impact of instructional behaviour and learner characteristics on students' learning process on web enhanced courses.

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