

## A Study of Student Perspectives on Web-Based Learning Technology in Merchandising Courses

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### 머천다이징 교과과정에서 인터넷을 기반으로한 학습테크놀로지에 대한 대학생들의 시각에 관한 연구

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#### Abstract

Assessment of the implementation of a web-based courseware technology application across a merchandising program over a two-year period provides empirical evidence that students believe the technology was easy to use and useful. Results also show that the use of the application was not a hard-ship for the students in terms of time or access, that students in lower class ranks who had not had technology enhanced courses previously were more satisfied with the technology than upper class students, and that perceptions of the technology and satisfaction with it increase with experience using the technology.

**Key words:** Apparel merchandising, Internet, Student learning, e-technology acceptance, WebCT; 머천다이징, 인터넷, 학습, 테크놀로지수용, 웹시티

#### I. Introduction

Many institutions of higher education in the U. S. are experiencing increased faculty loads as a result of extreme budgetary pressure, despite the fact that student enrollments are increasing rapidly. In addition, stakeholders are demanding higher quality teaching. This poses an interesting conundrum for faculty: how do we serve larger and larger numbers of students in our courses and simultaneously increase the quality of the learning experience for these students?

Many universities have turned to the Internet as a solution, with recent studies showing that web-based

course materials improving teaching and learning in college courses(Karuppan & Karuppan, 1999). Use of commercial-off-the-shelf online learning environment applications has increased dramatically as faculty members have begun to create course materials geared to students with various learning styles. These applications make it easy for faculty to put material onto course web pages to allow students to access it, enhance student learning style, and improve student success in the course.

One reason to integrate teaching materials and the Internet is relevance of the web to the student population. Statistics show that over 90% of traditional college students have experience with the Internet, and 24 hours - 7 days availability makes the Internet an attractive and convenient way to make course

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content available. One study examining use of online instructional tools (WebCT) found empirical evidence that availability of materials on a course website helped some students focus on the topic and learn more quickly (Morss, 1999). The study also found that students did not want online materials to replace textbooks. Another study examining student use of a course website (WebCT) and performance in the class found that, while usage in general was very high, it varied widely among students. Students who used the site more frequently scored higher in the class than those who used it less frequently (Henly & Reid, 2001). Research suggests that use of online technologies may help those students who use them.

Another argument for using web-based learning technology in the curriculum is its relevance to computer literacy that is desired by employers in today's marketplace (Benbunan-Fich et al., 2001). The use of technology in the curriculum, in the form of spreadsheets, word processing, databases, CAD, and the like, has been prevalent for several years now, where assignments are designed to develop student expertise in use of the software. However, the use of online learning environment applications is different. Assignments may be posted on the application, but the purpose of the assignments is not to develop expertise in the application. Rather, these applications are used as an auxiliary technology, to facilitate learning, so they serve as a receptacle of learning aids, providing indirect benefits such as general technology literacy. Students use many of the functions voluntarily. So, these applications will only enhance the student learning experience to the extent that the students accept and use them.

One of the recently adopted online learning environment applications is WebCT. Because many merchandising programs experienced increase in enrollment over years, we decided to try the application in several apparel merchandising courses. As part of our assessment of this project, we wanted to investigate student perceptions of the online learning environment software to identify factors that might help us entice non-adopters or hesitant-adopters to adopt. The goal of our implementation project was to incorporate online learning technology (WebCT) into the

merchandising curriculum to improve our ability to serve students in our large and growing classes, and to increase interactivity between and among students and faculty. Specifically we attempted 1) to find out whether students have sufficient resources to use WebCT, 2) to investigate how much and how frequently students used the Web-assisted course tool, 3) to find out how students perceived the Web-based technology for learning and how student characteristics influence their perception on the web-based instructional technology tools, 4) to examine whether students liked and were satisfied with the WebCT and how student characteristics influence these variables and 5) to verify the student overall performance to measure whether WebCT was effective or not. The results will help educators and marketers of online learning environment applications understand the factors that increase the likelihood that a learner will use the course tool to enhance learning.

## II. Research Background

### 1. E-learning Environment Applications and WebCT

There are several commercial-off-the-shelf online learning environment applications available, such as WebCT, Blackboard, WCB (Web Course in a Box), Top Class, etc. They all have similar functions that faculty use for course building and students use for learning (Morss, 1999; Henly & Reid, 2001). A secure course website is created and students, faculty, and teaching assistants enter a password to access the site from the Internet, or a college intranet using a web browser. The course site can use any or all of several communication tools, such as e-mail, bulletin boards, chat rooms, and asynchronous discussions. These tools facilitate interaction between and among students and faculty.

A calendar is one tool that is generally available to be customized for the course. Course management tools are available for tracking grades, gauging student interaction, and assessing student use of the application and specific content. Various tools exist for faculty to create and post course content and

learning aids, for example, a glossary, quizzes & self-tests references, and a wide variety of content materials such as guided outlines or lecture visuals.

Researchers have noted that these online learning applications are attractive to faculty because they allow non-technical users to develop attractive and useful environments quickly (Getty, et al., 2000; Morss, 1999), support increased interactivity, and facilitate grade/course management (Getty et al., 2000; Henly & Reid, 2001).

WebCT (Web Course Tool) was first developed by researchers in the Department of Computer Science at the University of British Columbia and has been implemented at many institutions in the United States recently. This web-browsing based program provides a secure, two-way, interactive environment between and among students and instructors, and allows easy creation of course webpages for non-technical users. Instructors can manage several classes using WebCT with a single, simple log on, and can save, copy, and paste parts of or entire WebCT classes easily. WebCT can be used for a simple website that hosts several classroom materials, or can be used to create an entire, self-contained online course.

## 2. Ways to Incorporate Web-based Learning Technology in Merchandising Curriculum

There are about 25 tools available in WebCT from which instructors can select to customize the courses. Instructors, as designers of a course WebCT can upload MS word, pdf or html versions of any documents that can be used for class materials, such as syllabus, project instructions, job announcements or resume writing skills. To accomplish objectives of the study, we 1) developed a WebCT site for six required classes in the program that had never previously implemented a Web-based learning technology, 2) developed content using various WebCT tools appropriate for each of the classes, and 3) developed a survey to examine student perceptions, liking, and satisfaction with the technology. Special tools designed for WebCT and implemented in the participating classes are as follows.

*Class Notes* was used in all of the classes to post

several kinds of materials for the students. Lecture outlines were available for students in all classes to print, bring to class and fill in. Practice problems were posted for the merchandising math class. Study questions for reading assignments were provided for the global issues class. Exam review pages and answer keys for exams/quizzes were also used in the global issues class. The *Quiz/Self-test* tool allowed administration of timed tests and immediate feedback for both graded and non-graded purposes. Non-graded quizzes were used in the merchandising math, while graded quizzes were used in the global issues class. The *Grades* tool was used in all classes, allowing instructors to manage grade books and students to check their own grades and class averages at any time. The *E-mail* tool was used in all courses. The mail resides within the WebCT file for each course, so faculty members don't have to worry about losing a student's e-mail in their regular e-mail box. Sending mail to the entire class is also very easy with this tool. The *Calendar* tool was also used in all classes. Assignment due dates, exam dates, readings for class and other pertinent dates were posted. The information can be changed at any time, providing students an up-to-date schedule at all times. The *Threaded Discussion* tool was used in the global issues course. Content related topics were assigned for students to discuss. Exam preparation and other course related questions were posted and answered by students. This tool was also used for group projects, with each group having its own private discussion session. The *Image Database* tool was used for the ready-to-wear analysis class. Images were posted with written descriptions and students could sort and search the database.

## 3. Personal Characteristics and Web-based Learning Technology

Researchers have proposed that characteristics of individual technology users influence perceptions of ease of use and usefulness. Perceived ease of use is the degree to which an individual believes that learning to use a technology will require little effort. Perceived usefulness refers to the extent that an

individual believes that use of the technology will improve performance. One study of microcomputer usage found empirical evidence that 1) user training, and 2) user computer experience, influenced perceptions of ease of use, usefulness and usage (Igbaria et al., 1995). An empirical, longitudinal study examining e-mail usage of graduate business students suggested that as a user becomes more experienced with a technology, perceptions of usefulness directly determine intention to use and usage (Szajna, 1996). In addition, as experience increases, the influence of perceptions of ease of use on perceptions of usefulness decrease. A study to examine employee adoption of a new workstation operating system found that an individual's 1) level of education, 2) previous computer experience, and 3) participation in training influenced perceptions of ease of use and usefulness (Agarwal & Prasad, 1999).

Information systems researchers have studied individuals' acceptance of technology in various organizational and personal situations and they propose that perceptions of ease of use and usefulness of the technology have a positive, direct influence on students' liking of the technology (Adams et al., 1992; Davis, 1989; Davis, 1993; Davis et al., 1989; Igbaria et al., 1995; Mathieson, 1991; Subramanian, 1994; Szajna, 1996) that will further influence intention to use the technology. In addition, students who used Web-based learning technology may be more satisfied with the technology because they are attractive to students with various learning styles (Clark, 2002) and enhance students' access to the courses (Hayes, 2000).

Based on our review of literature, we propose that individual characteristics of students, including overall GPA, frequency of computer and Internet use, concurrent WebCT classes, computer access, and class year, will be related to differences in students' overall perceptions and assessments of WebCT. Specifically, we will examine how these personal characteristic variables are related to students' perceptions of the usefulness and ease of use of WebCT. We will also examine how effective WebCT was in the merchandising program by assessing how much students liked WebCT and whether they were satisfied with it. Some students may like this new technology more and some

students may be more satisfied with the technology. After investigating factors associated with students' liking and satisfaction with WebCT, we suggest ways to increase the effectiveness of WebCT.

### III. Method

To assess adoption of the online learning technology and satisfaction with the technology, we administered a survey to students in all classes using established measures at the end of each quarter. The procedure, sample, and measures are described below.

#### 1. Procedure

In the second class-session for each course, the students were given an explanation and demonstration of WebCT, using the same script for all courses. The web address to access WebCT was listed on the front page of the syllabus for each class, and the login id and password were included also. In addition, a WebCT user manual containing this same information was distributed in the informational session. The script emphasized how easy the technology was to use and how useful it would be for learning.

At the end of the course, time was spent at the end of one class-session to complete a two-page survey. An incentive of five extra credit points was given for completing it. Participation was voluntary and students were not penalized for non-participation. If they did not choose to participate, they indicated this on their survey form and were still awarded extra credit points for returning the survey.

Data were obtained over a two year period, consisting of five consecutive academic quarters: three classes from first quarter, three classes from the second quarter, three classes from the third quarter, and four classes from fourth quarter and two classes from the fifth quarter.

#### 2. Sample

The sample frame consisted of all students enrolled in the merchandising mathematics, business of fashion, ready-to-wear analysis, and global issues courses.

The business of fashion students were primarily sophomores, the ready-to-wear students were primarily juniors, and the mathematics and global issues students were primarily seniors. A total of 1172 surveys were entered for analysis. The respondents of this study were predominantly female(89.3%) and merchandising majors(83.2%). Most of them(74.1%) had a computer at home, 75.3% had a computer at school, while only 20.6% had a computer at work. The vast majority of them(91.7%) used a computer at least several times a week, and 88.2% of them used the Internet at least several times a week. In terms of class rank, 15.1% of them were sophomores( $n=146$ ), 23.6% were juniors( $n=228$ ), 56.2 % were seniors ( $n=543$ ), and 5.2 % were freshmen, graduate students or others. In addition, sample students' overall GPA was 2.84(4.0 scale) on average, and their WebCT assisted class performance(course grade) was 86.99 % on average. Students previously had an average of 2.4 WebCT classes(inside or outside the department), and were taking 1.52 WebCT classes concurrently.

### 3. Measures

#### 1) Perception variables

Two perception variables known to influence the acceptance of technology were included in this study: perceived ease of use and perceived usefulness. *Perceived ease of use* is defined as the degree to which an individual believes that learning to use a technology will require little effort(Davis, 1989). Six, five-point Likert-type questions(1=strongly disagree) were used to assess student perceptions that WebCT was easy to use. Sample question items were, "It is easy for me to remember how to perform tasks using WebCT", "I believe that it is easy to get WebCT to do what I want it to do," and "My interaction with WebCT is clear and understandable." Davis reported Cronbach's alpha of .95(1989), indicating acceptable reliability. The alpha of the six perceived ease of use items was .95 in this study. *Perceived usefulness* is the extent that an individual believes that use of the technology will improve performance(Davis, 1989). Seven, five-point Likert-type questions(1=strongly disagree) were used to assess student perceptions that WebCT was useful.

Sample question items were, "WebCT enables me to accomplish study tasks more quickly," "WebCT improves my grade," "WebCT gives me greater control over my studies," and "WebCT improves the quality of the assignments I do." Cronbach's alpha of .98 was reported previously by Davis(1989). The alpha of the seven perceived usefulness items was .96 in this study.

#### 2) Liking and Satisfaction

*WebCT Liking* is an individual's feeling or emotion about using the technology(Davis, 1989). Three, five-point Likert-type questions(1=strongly disagree) were used to assess student attitudes towards using WebCT. Question items were, "I like using WebCT," "WebCT is fun to use," and "WebCT provides an attractive learning environment." Davis reported Cronbach's alpha of .85 and .82 in previous research (1989). The alpha of the three liking items was .94 in this study. *Satisfaction* is an emotional response to the evaluation of outcomes of the WebCT usage experience. Six, five-point bipolar questions from Oliver and Swan(1989) were used to assess overall satisfaction with WebCT(displeased/pleased, disgusted/contented, dissatisfied/satisfied, unhappy/happy, made me do a poor job/helped me do a good job, was a poor choice/was a wise choice). The cronbach's alpha was .96 in this study. In addition to the overall satisfaction measure, students were asked to mark the level of their satisfaction on 5 point Likert-type scale(5=very satisfied; 1=not very satisfied) with the tools used in their course WebCT, in order to investigate satisfaction with the individual class tools.

#### 3) Performance and behavioral variables

In order to assess students' performance with each class, grades were obtained from the class instructors and matched with the survey data using the last four digits of social security number and students' last and first initials. Students were asked to respond to WebCT related behavioral items including frequency of using WebCT(per week) and average weekly hours logged on to WebCT. In addition, WebCT hits were obtained from class instructors. WebCT hit data

is easily obtained from the instructor’s WebCT course management tools, and represents the number of Website visits that each student makes. This statistic gives objective behavioral data, but has the disadvantage of being potentially biased depending on the class tools and browsing methods used by the student(new window vs. current window).

**4) Other variables**

Other variables included in the survey questionnaire were 1) experience with WebCT, 2) the WebCT class load, and 3) accessibility of the technology. Students were asked to list the number of WebCT classes taken so far, and the number of WebCT classes they were taking concurrently. Technology availability was measured by summing the number of Internet connections available at 1) home, 2) work, and 3) school. For example, if a student had computer connections at home and works, the availability figure was “2.”Demographic characteristics such as gender, class standing and major were included in the survey. At the end of the survey, there was an open-ended question about any comments they had about WebCT.

**IV. Analysis and Results**

**1. Availability of Resources**

One critical aspect of successful implementation of Web-based learning technology is whether students have sufficient resources to use WebCT. First, students were asked whether they had computers at home, school or at work. Results show that 88.8% of them had a computer at home, 90.2% had a computer at school, while 24.6% of them even had computer access at work. There was no single student who responded that they had no computer access at home,

**Table 1. Students’ use of computer and internet**

(n=1172)

	Frequency (%)	
	Use Computer	Use Internet
Daily	695 (71.0%)	623 (63.7%)
Several times a week	209 (21.3%)	245 (25.1%)
Once or twice a week	66 ( 6.7%)	93 ( 9.5%)
Once or twice a month	8 ( .8%)	15 ( 1.5%)
A few times a year	1 ( .1%)	2 ( .2%)
Missing	193	192

school, or at work. While only 17.7% of them had one place among home, work or school that offered computer access, more than half of them(61.0%) had at least two places that offered computer access, and 21.3% of them had computer access at home, school and at work.

Students were also asked to indicate how frequently they used the computer and the Internet(Table 1). Most of them(71%) used the computer everyday and 63.7% of them used the Internet everyday. The overwhelming majority of them(99.1%) used the computer at least once a week, and 98.3% of them used the Internet at least once a week. Overall, resources that are required for WebCT usage seemed to be sufficient for students to use the various tools on the class’ WebCT pages.

**2. WebCT Usage by Merchandising Students**

One of the main goals of the study was to investigate how much and how frequently students used the Web-assisted course tool, because it may be an indication of whether or not the class WebCTs held their interest, and whether or not it imposed too much workload. <Table 2> shows descriptive statistics related to WebCT usage statistics employed in the study for

**Table 2. WebCT usage**

(N=1168)

Variables	Minimum	Maximum	Mean	Standard Deviation
Frequency of using WCT (per week)	1	7	4.46	1.74
Average hours of using WCT (per week)	0	12	1.62	1.57
WebCT Hits (per quarter)	1	1222	98.89	112.43

the five-quarter period of time. Overall, students logged on to a class WebCT 4.46 times a week and spent on average, 1.62 hours a week using materials on the course site. This suggests that students were likely to log onto a class WebCT almost once a day during the weekdays and spend about 20 minutes at each log on, which may indicate that despite many activities held on course WebCT, it did add a tremendous workload to students.

As stated earlier WebCT hit data can be an objective but potentially biased figure of WebCT usage. But it may be significant data, since it only includes critical class tools such as class content tools, online quizzes, threaded discussion tools, and other redundant Website visits within or through the class WebCT. Overall, students visited major WebCT pages about 99 times throughout the quarter. The

maximum WebCT hit score was 1222 per quarter.

### 3. Students' Perceptions about WebCT and Influential Students Characteristics

Another purpose of the survey conducted each quarter was to find out how students perceived the Web-based technology for learning. Two variables were included in the study: perceived usefulness and perceived ease of use and individual scores were calculated based on the mean scores of multiple items.

Overall, students showed higher means on perceived ease of use of WebCT technology than on perceived usefulness. WebCT is a web-based learning tool and therefore, for students who easily browse and search the Internet, this new courseware technology was not perceived to be difficult to use. Also, the

Table 3. Perceptions about WebCT and student characteristics

Variables	Perceived Usefulness		Perceived Ease of Use	
	Mean	Test statistics	Mean	Test statistics
Gender				
Female ( $n=866$ )	4.12	$t=1.14$	4.52	$t=1.43$
Male ( $n=106$ )	4.02		4.44	
Class Standing				
Sophomore ( $n=146$ )	4.27 (a)	$F=13.26^{***}$	4.61	$F=3.87^*$
Junior ( $n=228$ )	4.30 (a)		4.56	
Senior ( $n=543$ )	3.98 (b)		4.46	
GPA				
-2.5 ( $n=189$ )	4.13	$F=.60$	4.46	$F=.80$
2.5-3.0 ( $n=477$ )	4.11		4.53	
3.0-4.0 ( $n=273$ )	4.05		4.57	
Prior experience with WebCT (overall)				
No classes ( $n=131$ )	4.22 (a)	$F=6.80^{***}$	4.56 (ab)	$F=4.23^{***}$
1 prior WCT class ( $n=241$ )	3.92 (b)		4.42 (a)	
2 prior WCT classes ( $n=202$ )	3.94 (b)		4.40 (a)	
3 prior WCT classes ( $n=146$ )	4.19 (a)		4.58 (ab)	
4 prior WCT classes ( $n=97$ )	4.34 (a)		4.63 (a)	
5 and more ( $n=162$ )	4.28 (a)		4.64 (a)	
WebCT course load				
Taking 1 class concurrently ( $n=671$ )	4.09	$F=.56$	4.49 (b)	$F=3.52^*$
Taking 2 classes concurrently ( $n=370$ )	4.11		4.49 (b)	
Taking 3 and more classes ( $n=106$ )	4.18		4.69 (a)	
Have access to computer				
1 place (home, sch., or work) ( $n=173$ )	4.09	$F=.24$	4.39 (b)	$F=3.87^*$
2 places (home, sch., or work) ( $n=597$ )	4.10		4.53 (a)	
3 places (home, sch., or work) ( $n=208$ )	4.15		4.57 (a)	

\* $p<.05$ , \*\*  $p<.01$ , \*\*\*  $p<.001$

Note: Results from Tukey's  $b$  multiple comparison of means are indicated as  $a$ ,  $b$  and  $c$  in parenthesis. Here, mean scores with notation  $a$  is significantly different from mean scores with the notation  $b$ .

mean score for perceived usefulness was 4.19 on a 5-point Likert scale. It implies that students perceive the Web-based learning technology as useful.

In order to examine the influence of students' demographic characteristics on perceptions, *t*-tests and ANOVA were conducted with WebCT perceptions (perceived usefulness and perceived ease of use) as dependant variables (Table 3).

Although there was a big difference in sample size between female and male students, no significant gender differences in means of perception variables were detected. Compared to seniors, sophomores and juniors tended to perceive WebCT to be more useful and easier to use ( $F=13.25, p<.001$ ;  $F=3.87, p<.05$ ). The tendency was stronger for perceived usefulness than for ease of use perception. This may due to a confounding effect with the classes they took. Seniors who are so used to the traditional classes without web-based technology may be reluctant to perceive that this new addition to their classroom is useful and easy to use.

There were interesting results regarding the student's prior experience with WebCT. Students who had never been exposed to the WebCT environment (including non-merchandising classes) showed more favorable perceptions than students who had previous experience with WebCT. This result did not coincided with the prior researches (i.e., Igbaria, Guimaraes & Davis, 1995) about the influence of experience on perception of usefulness. On the other hand, among who had past experience with WebCT classes, the more WebCT experience they had, the more they had favorable their perceptions of usefulness and ease of use. This may due to the fact that most of the second or third time users experienced WebCT with non-merchandising classes (usually general courses for freshmen) that used minimum or simple WebCT tools only. Therefore, when they are exposed to a merchandising class WebCT, the influence of WebCT might have been positively stronger. However, more detailed further study has to be conducted to verify the reasoning. The effect of prior experience with WebCT on perceived ease of use is weaker than on perceived usefulness. This result supported a prior research done by Szajna (1996) that as experience

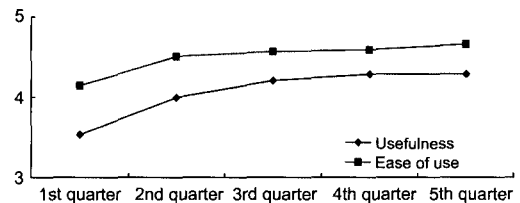


Fig. 1. Perceived usefulness and ease of use over time in a Merchandising Program.

increases the influence of ease of use perception gets weaker.

In addition, students perceived WebCT to be easier to use when they were taking more WebCT classes at the same time ( $F=3.52, p<.05$ ), and when they had multiple places to access the computer ( $F=3.87, p<.05$ ). However, WebCT course load or computer accessibility did not significantly impact perceived usefulness of WebCT.

<Fig. 1> illustrates means of students' perception of WebCT by quarter in a merchandising program. The mean score for perceived ease of use and usefulness were lowest when WebCT was introduced to the merchandising department for the first time, but perceived ease of use showed a dramatic increase in the second quarter of WebCT implementation. Perceived usefulness showed a steady increase as each quarter went by. As the 5<sup>th</sup> quarter, the mean score for perceived usefulness was 4.29 and perceived ease of use was 4.66. They were 3.54 and 4.15 respectively in the first quarter.

#### 4. Students' Liking/Satisfaction with WebCT and Influential Students Characteristics

Overall, students showed a high level of overall satisfaction (mean=4.37) and liked WebCT fairly well (mean 4.19 out of 5 point scale). These simple results imply that students were positive about the implementation of WebCT technology in their merchandising classes.

In order to understand students' satisfaction with different course tools implemented in the various classes, students were asked to list their level of satisfaction with individual class tools on a 5-point scale (Table 4). Results show that they expressed the high-



est level of satisfaction with the secure grade checking tool of WebCT(mean=4.64). However several students commented verbally that grades were not posted soon enough.

They also liked to have information that could be obtained from physical classes on-line such as lecture outlines(mean=4.56), and more student service related materials on WebCT such as hyperlinks and

**Table 4. Students' satisfaction with individual WebCT tools**

Satisfaction with class tools	N	Mean	Standard Deviation	Rank
Grade checking	907	4.64	.75	1
Class information (syllabus, project instructions....)	841	4.56	.69	2
Others (Website links, job announcement, resume writing....)	840	4.48	.78	3
Image database	331	4.46	.74	4
Class note or study guide	1002	4.45	.81	5
Quiz/self-test	260	4.34	.90	6
Calendar	908	4.26	.87	7
Glossary	737	4.15	.93	8
WebCT e-mail	704	4.08	1.0	9
Threaded discussion	233	3.96	1.0	10

**Table 5. WebCT Liking/satisfaction and student characteristics**

Variables	WebCT liking		Satisfaction with WebCT	
	Mean	Test statistics	Mean	Test statistics
Gender				
Female (n=866)	4.39	$t=2.30^*$	4.22	$t=3.18^*$
Male (n=106)	4.22		3.96	
Class Standing				
Sophomore (n=146)	4.43 (a)	$F=2.30^*$	4.61 (a)	$F=12.35^{**}$
Junior (n=228)	4.33 (a)		4.46 (b)	
Senior (n=543)	4.05 (b)		4.37 (b)	
GPA				
-2.5 (n=189)	4.16	$F=.13$	4.34	$F=.39$
2.5-3.0 (n=477)	4.19		4.39	
3.0-4.0 (n=273)	4.17		4.34	
Prior experience with WebCT (overall)				
No classes (n=131)	4.40 (a)	$F=5.10^{***}$	4.57 (a)	$F=9.05^{***}$
1 prior WCT class (n=241)	4.01 (c)		4.17 (c)	
2 prior WCT classes (n=202)	4.10 (bc)		4.23 (bc)	
3 prior WCT classes (n=146)	4.30 (ab)		4.44 (ab)	
4 prior WCT classes (n=97)	4.40 (a)		4.60 (a)	
5 and more (n=162)	4.33 (a)		4.53 (a)	
WebCT course load				
Taking 1 class concurrently (n=671)	4.19	$F=2.76$	4.37	$F=.30$
Taking 2 classes concurrently (n=370)	4.13		4.35	
Taking 3 and more classes (n=106)	4.37		4.41	
Have access to computer				
1 place (home, sch., or work) (n=173)	4.14	$F=.60$	4.26	$F=2.80$
2 places (home, sch., or work) (n=597)	4.22		4.42	
3 places (home, sch., or work) (n=208)	4.18		4.34	

\* $p<.05$ , \*\* $p<.01$ , \*\*\* $p<.001$

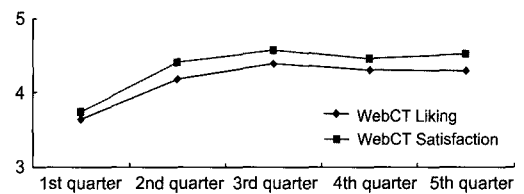
Note: Results from Tukey's *b* multiple comparison of means are indicated as *a*, *b* and *c* in parenthesis. Here, mean scores with notation *a* is significantly different from mean scores with the notation *b*.

job postings(mean=4.48). The image data base and study guide/class note tools also satisfied students (mean=4.46 and 4.45). They were quite satisfied with the quizzes they took on WebCT(mean=4.36) but some students complained verbally about problems with taking quizzes on WebCT depending on the browser they used.

Students were less satisfied with WebCT e-mail (mean=4.08) and threaded discussions(Mean=3.96) compared to the other tools used on the class WebCT. Although it is secure and convenient to use, students might have thought that the WebCT e-mailing function was an additional e-mail address that they had to manage, and that the threaded discussion was additional course work in addition to class activities. Calendar and glossary tool was not very satisfactory to students compared to other course tools. For most of the classes, class schedule in class syllabus, in class announcement and WebCT homepage announcement were used to let students know about class schedules and thus students probably did not have to rely too much on calendar tool on WebCT. In addition, the glossary tool used in this study was non interactive glossaries which required students to move back and forth to glossary site on WebCT. More interactive glossary tool has to be developed by the course instructor to make students satisfied.

<Table 5> illustrates the impact of students' demographic variables on WebCT liking and satisfaction. In contrast to the perception variables, female respondents showed significantly higher WebCT liking and overall satisfaction than males( $t=2.30, p<.05$ ;  $t=3.18, p<.01$ ). Female students liked WebCT and were satisfied with WebCT more than were male students. Regarding class standings, similar to the perception variables, lower class students liked WebCT significantly more than upper class students ( $F=13.99, p<.001$ ;  $F=12.35, p<.001$ ). Again, seniors were likely to be less fond of and less satisfied with WebCT than juniors and sophomores. However, availability of the technology, WebCT class load, and students' overall GPA did not have any significant influence on WebCT liking and overall satisfaction.

Also similar to the perception variables, students with no prior WebCT experience expressed a higher



**Fig. 2. WebCT Liking and WebCT satisfaction over time in a Merchandising Program**

level of liking and satisfaction. Among experienced students, prior experience positively influenced student liking and satisfaction with WebCT( $F=5.10, p<.001$ ;  $F=9.05, p<.001$ ). Although not significant by Tukey's *b* multiple comparison test, students who had five or more WebCT class experiences showed slightly lower WebCT liking and satisfaction than students who previously had four WebCT classes. This may be because students with WebCT experience in five or more classes were students who had WebCT in non-merchandising classes such as biology, mathematics, and psychology. Again, future study should be conducted to verify the results and the reasoning.

<Fig. 2> shows the longitudinal changes of means of WebCT liking/satisfaction in a merchandising curriculum. WebCT liking and satisfaction with usage increased over time. Especially, WebCT liking and satisfaction increased dramatically after the first quarter that the technology was introduced to the merchandising courses.

### 5. Relationship with Overall Class Performance: Effectiveness of WebCT

In order to see whether or not students who liked and were satisfied with the class WebCT performed well in class, Pearson's correlation coefficients were examined(Table 6). Student liking and satisfaction with WebCT were significantly related to WebCT assisted class performance( $r=.071, p<.05$ ;  $r=.085, p<.05$ ).

**Table 6. Pearson correlation coefficients** ( $N=1168$ )

	Course grade %
WCT liking	.071*
Overall satisfaction	.085**

\* $p<.05$ , \*\* $p<.01$

.01). These tendencies were stronger for WebCT satisfaction. Students who liked WebCT more and were more satisfied with WebCT tended to show a higher course grade. This supports many prior researches that emphasized the effectiveness of online course tool for contemporary students (Karuppan & Karuppan, 1999; Morss, 1999). Some of the students' comments included, "Really loved WebCT, liked WebCT", "WebCT very useful", "Convenient, thorough, detailed, & accessible", "Very student friendly", "Every class at OSU should use it", "want to use in other classes", "wants to use again".

## V. Conclusions

This paper has provided an investigation of student perceptions of the adoption of a web-based learning courseware application into a merchandising program. Overall, the two-year implementation of WebCT into our merchandising program was successful. Feedback from merchandising students who have used WebCT in our classes was very positive. Students perceived WebCT to be easy to use and useful. They were interested in WebCT and fairly satisfied with it.

Availability of computer and Internet access was not a problem for students. In fact, using the computer and the Internet is almost a daily routine for them, so moving toward Web-assisted or Web-only classes will be the future for our classrooms since it makes our classes more consistent with student lifestyles. Students were smart enough to use this technology frequently, but not excessively.

There were several student characteristics that affected perceptions, liking, and satisfaction with the class WebCT. Students who were exposed to this courseware early in their academic career were more positive about WebCT. Students who had more experience with WebCT were more positive about it. In addition students who had not had prior WebCT experience showed very positive perceptions, liking and satisfaction. Students who were enrolled in more WebCT classes concurrently and had multiple places to access the computer among home, school or at work perceived WebCT to be easy to use. Female students in the merchandising program tended to like

WebCT more and were more satisfied with it compared to their male cohorts. Students' overall GPA had some significant relationship with WebCT perceptions, liking, or satisfaction.

The cross-course, longitudinal assessment of perception, liking and satisfaction showed that the first quarter of WebCT courseware implementation might be the toughest time for both instructors and students. However, as more students become accustomed to this courseware and instructors put more efforts into building better WebCT materials, overall WebCT perceptions, liking, and satisfaction are likely to increase. Technology acceptance research suggests that, as exposure to technology increases over time, ease of use may become less important relative to usefulness (Davis, 1989), so educators would be advised to stress usefulness to a greater degree for upper class students, and stress both more equally for lower class students who have less exposure to technology. Educators need to make a strong case for usefulness of the tool and ease of use tool to students to increase liking and satisfaction with the technology.

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## 요 약

본 연구에서는 머천다이징 프로그램에서 인터넷을 기반으로 한 학습시스템(e학습시스템)인 WebCT를 의류학과 내의 머천다이징 교과과정에서 운영하였을때 학생들이 경험한 여러가지 시각에 대하여 알아보았다. 연구는 온라인 병행강의 혹은 온라인 강의가 시도된 바 없는 한 미국대학에서 WebCT를 처음 도입한 후 2년의 기간 동안 학생들이 시스템에 대하여 느끼는 편의성과 유용성 그리고 선호도와 만족도가 어떻게 바뀌어나가는지 통시적으로 알아보았으며 이러한 경향이 수강학생들의 학점에 미치는 영향을 알아보았다. 2년 동안 매학기 평균 1.5개 정도의 WebCT운영강의에 노출된 학생들이 매 학기말마다 WebCT의 편의성, 유용성 그리고 선호도와 만족도를 묻는 설문에 응하였으며 각 학생들의 최종성적이 함께 데이터화 되어 분석되었다. 분석결과 인터넷이나 컴퓨터사용여부는 더이상 e학습시스템의 걸림돌이 되지 않는 것으로 나타났으며 학생들은 시스템을 무시하거나 과도하게 사용하지 않고 전반적으로 매우 효율적으로 사용하고 있었다. 학생들은 4년간의 대학생활 중 일찍 WebCT에 노출될수록, 한꺼번에 여러과목의 WebCT과목을 들을수록, WebCT수업을 경험할수록 그리고 여학생일수록 WebCT가 유용하다고 지각하고 있었으며 선호도와 만족도가 높은 것으로 나타났다. 한편 WebCT에 대한 선호도와 만족도는 한학기 동안 수강 후 학생들의 성적에 유의한 영향을 주는 것으로 분석되었다.