Student Satisfaction in Web-enhanced Learning Environments

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Abstract

Student satisfaction is an important part of the effort to successfully market higher education. This is especially true given the rapid increase in on-line course offerings. This paper explores the relationship among attitudinal variables contributing to student satisfaction in web-enhanced courses. The structural model indicates strong relationships among three variables: satisfaction with the instructor, perceived ease of use of the course technology, and satisfaction with the course. The authors suggest that this triad of relationships represents the most important considerations for students and instructors in Internet enhanced courses.

INTRODUCTION

The debate over the merits of on-line education has come to the forefront of pedagogical research with the substantial increase in the number of online courses offered at universities across the nation. The results of a study conducted by the U.S. Department of Education (1998) illustrate the phenomenal growth in on-line courses. Between 1995 and 1998, the number of distance education courses increased by 72%. Additionally, the study found that 1,680 institutions offered approximately 54,000 online education courses in 1998, supporting an enrollment of 1.6 million students. In 2002, 81% of higher education providers offered at least one online course, and 34% had complete online degree programs (Conhaim, 2003). More recently, a 2007 study by the Sloan Consortium suggests that almost 3.5 million students were taking at least one online course in the fall of 2006, representing nearly 20 percent of all US higher education students (Allen & Seaman, 2007).

While on-line course delivery is a significant part of higher education, to a greater extent, delivery systems such as Blackboard/Web Course Tools (Web-CT) are employed on the Web to augment course offerings by adding an on-line component to traditional course offerings. Southern Illinois University Edwardsville alone has more than 500 web-enhanced course offerings using Blackboard/Web-CT (Blackboard, 2006), while thirty percent of the course offerings at the University of Birmingham have an on-line component using Blackboard/Web-CT (Caldwell, 2005). With the Acquisition

of Web-CT by Blackboard in early 2006, Blackboard/Web-CT now serves over 3,400 institutions in 80 countries (Blackboard, 2008).

The burgeoning of technology in our society and the rapid adoption of technological solutions in every aspect of education may necessitate a paradigm shift in our understanding of the classroom experience. The surge of these online educational offerings and the impact on students has not been examined to a great extent. Priluck (2004) summarizes the existing work in the area of online education and finds that most research is based upon examining distance education, hybrid courses and web-assisted courses, usually using only one classroom at one university. Grossman (1999) indicated that educational techniques are being adopted prior to a full understanding of all of the consequences. With the brisk pace of adoption of this technology, more work is needed. Malhotra (2002) calls for researchers to develop empirical evidence that would support a better understanding of the use of technology in the classroom. Malhotra's suggestions to further our understanding include but are not limited to: 1) the role of technology to further marketing education; 2) the adoption of technology by marketing educators, administrators and students, and; 3) how technology affects marketing pedagogy.

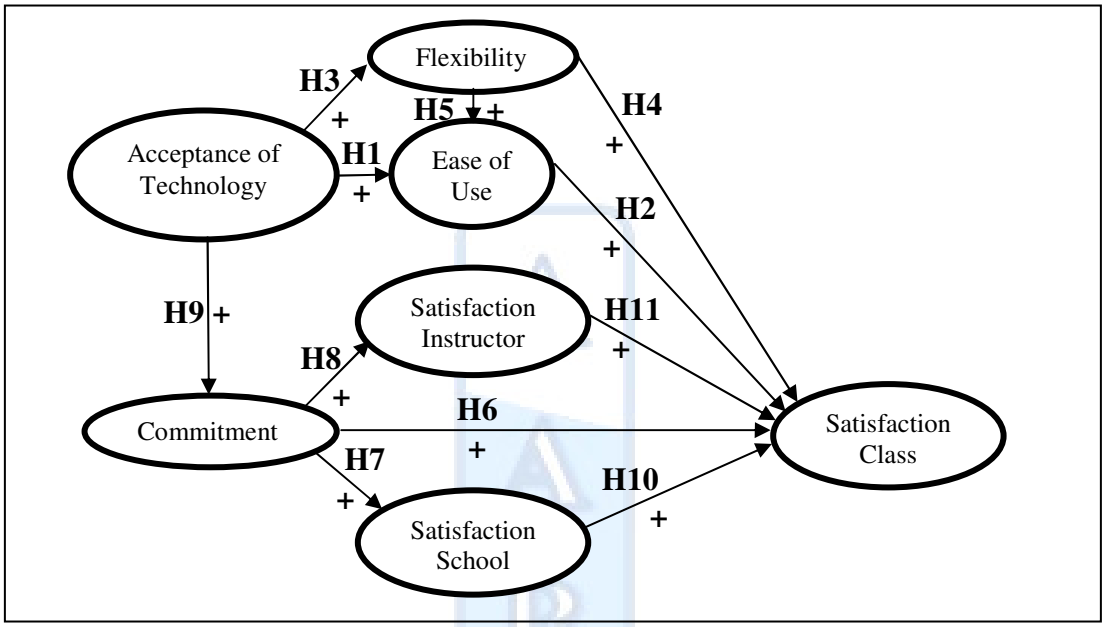
However, questions remain. What causes some students to lose interest or motivation in a class? Given the potential for the introduction of quality deficiency when instituting these new technologies, it becomes imperative to monitor and report actual outcomes of the use of such technologies. This paper addresses these outcomes of the use of classroom technologies from the students' perspective. Several issues of concern to marketing educators are examined as antecedent determinants of student satisfaction with students enrolled in web-enhanced undergraduate courses. Ideally, research would identify variables contributing to student satisfaction. Past studies have examined attributes associated with student satisfaction; however, the attributes examined in each of these studies have been limited. Previous literature has focused upon one or two components of satisfaction, whereas the literature suggests there are a multitude of variables affecting satisfaction and additional variables associated with satisfaction in Web-enhanced instruction.

When the Internet is employed in the course structure, additional questions arise. Do students perceive the technology as assisting or impeding the learning process? What are the determinants of student satisfaction in Web-enhanced courses? Are the students readily willing to accept the addition of new technologies in a course? The purpose of this study is to examine attitudes of satisfaction related to using Blackboard/Web-CT for students enrolled in an undergraduate "web-enhanced" business course and provide an analysis of variables that have been suggested to affect satisfaction, as they relate to satisfaction within the course.

The Technology Acceptance Model (TAM) is one theoretical model that attempts to explain use of computer based technologies, with the primary explanatory variables being perceived ease of use and perceived usefulness. In past research of the TAM model, authors have introduced measures from similar models, added belief factors, and examined various antecedents and moderators of the TAM relationships (Wixom and Todd, 2005). The hypothesized model presented in Figure 1 integrates variables from the TAM with variables traditionally thought to influence student satisfaction. The Variables included from the TAM include: acceptance of technology, ease of use,

flexibility. The attitudinal variables traditionally suggested to influence a student's satisfaction with a course includes: satisfaction with the instructor, satisfaction with the school, and commitment.

Figure 1
Hypothesized Relationships



Technology Acceptance

The Technology Acceptance Model (TAM) suggests that the primary determinants of whether or not a technology will be adopted are beliefs and attitudes toward that technology (Venkatesh and Davis, 2000; Davis, Bagozzi and Warshaw, 1989). In the context of web-enhanced courses, this model suggests that perceived usefulness and the ease of use of the delivery medium would enhance students' satisfaction with the medium and with their online course experience. The variables included in this model are suggested to influence the users' attitudes toward the technology and thereby their decision to adopt the technology. The model is well accepted in the information technology literature and has been shown to be a valid predictor of the use of computer software (Bagozzi, Davis and Warshaw, 1992); email (Gefen and Straub, 1997), and the World Wide Web (Atkinson and Kydd, 1997).

Arbaugh (2000) took this one step further by claiming that in the context of web-based courses, the TAM suggests that perceived ease of use of the delivery medium will enhance students' satisfaction with the medium and with their online course experience. More specifically, Arbaugh (2005) found that both perceived usefulness and ease of use were positively associated with student satisfaction ratings in online MBA courses. As additional technology is adopted in the classroom, it is prudent to observe the impact of these variables in conjunction with more traditionally accepted drivers of satisfaction in the delivery of education. Based on this past research, it follows that:

H1: Technology acceptance is positively related to perceived ease of use.
H2: Perceived ease of use is positively related to satisfaction with the class.

Flexibility

Past research on computer mediated communication suggests that the flexibility inherent in web-enhanced courses may help groups reach relational intimacy high enough to compare to face-to-face groups, though taking a longer time to develop (Chidambaram, 1996; Walther, 1992). This perspective asserts that flexibility in the course comes as a result of the medium being both time and place independent, allowing course interactions to continue over time and through any interruptions (Harasim, 1990; Leidner and Jarvenpaa, 1995). Because of this independence, students have a high degree of flexibility in regard to when and where they access web-enhanced courses and what course tools they choose to utilize. This flexibility may attract a more competent type of student or a non-traditional student. Having the flexibility, which students see as "freedom" should be related to both ease of use and satisfaction. This leads to the following hypotheses:

H3: Technology acceptance is positively related to perceived flexibility.
H4: Perceived flexibility is positively related to satisfaction with the class.
H5: Perceived flexibility is positively related to perceived ease of use.

Commitment

In a study examining commitment by Sager and Johnson (1989), findings indicated that socialization and satisfaction with superiors are the primary correlates of commitment. In another cross-cultural study of workers, it was revealed that commitment was strongly related to personal characteristics including socialization (Near, 1989). Burbach & Thompson (1971) and Dean (1961) also examined social issues and found that students who immerse themselves in their studies, without leaving time for socialization (and/or a job) may earn very good grades, yet feel a sense of alienation from the school experience. Thus, while commitment has been shown to be strongly tied to social interaction it may be more of an antecedent to satisfaction with the instructor, course, and school. When web-based interaction takes the place of face-to-face interaction, social opportunities are diminished, and a student's acceptance of the technology, self-commitment to education, and in turn satisfaction with the course and school may be compromised.

In web-enhanced courses, students have more responsibilities placed upon them than traditional face-to-face learning environments. For example, students may be required to download course materials, access Internet links, participate in on-line discussions, or meet deadlines that don't coincide with class lectures. Thus, self-regulated learning is necessary for the web-enhanced environment to be successful. Students must become active rather than passive learners. Self-motivation requires students to commit to the technology and to the course. Past research suggests that students with strong commitment will be more successful and learn the most in web-enhanced courses than those with less motivation (Frankola, 2001; LaRose, Gregg and Eastin, 1998). Student's commitment is a major factor that affects the attrition and

completion rates in the web-enhanced course and a lack of commitment is linked to high dropout rates (Frankola, 2001; Eastman and Swift, 2001). In addition, Eom, Wen and Ashill (2006) found that student motivation was positively related to perceived student satisfaction with the web-enhanced course. Students who are committed to their education beyond just being committed to one course should be more satisfied with their experiences. Thus, the following hypotheses are offered:

H6: Commitment is positively related to satisfaction with the course.

H7: Commitment is positively related to satisfaction with the school.

H8: Commitment is positively related to satisfaction with the instructor.

The TAM has not been studied as it relates to the previous work on student commitment. Holsapple and Lee-Post (2006) found that a critical factor of e-learning success is the online readiness of the students. They report that students should be screened based upon their responses to four readiness measures: academic preparation, technical competence, lifestyle aptitude and learning preference toward e-learning. Proserpio and Gioia (2007) believe that this generation should be termed the V-Generation, or the virtual generation. They assert that today's student is much more interested in e-learning, given the focus on living their lives in the virtual world, with cell phones, texting, instant messages, and social networking. According to their study, this new student dislikes group projects that require face-to-face meetings and prefer using groupware software and the Internet. Obviously, not all students are completely Internet savvy. However, if students are accepting of the technology involved in web-enhanced courses, and experiencing its' flexibility and ease of use, it follows that they should be more committed to the course. Thus, we hypothesize the following relationship between acceptance of technology and commitment:

H9: Acceptance of technology is positively related to commitment.

Satisfaction

Halsted (1999, pg. 14) examines the role of consumer satisfaction drivers and states that satisfaction research must identify the "appropriate comparison standard used by consumers in a given usage situation." Previous research on experience-based norms (Woodruff, Cadotte, and Jenkins,1983) suggests that consumers expect a given level of service based upon their previous experience with that specific type of service organization. In the context of satisfaction with their choice of institution, this notion suggests that satisfaction is a distinct construct that is mediated by prior perceptions of service quality (Cronin and Taylor, 1992; Bolton and Drew, 1991). It is axiomatic that situational involvement in choice of educational institution is high, and the measurement of satisfaction is generally made in a post-purchase evaluation process. Therefore while a student's overall satisfaction with the school may be linked to satisfaction generally, its effect on satisfaction with individual courses may be minimal.

H10: Satisfaction with the school is positively related to satisfaction with the class.

Given that the level of classroom interaction between professors and students is reasonably high throughout a semester and that the professor is the source of course information, it follows that the instructor provides a central focal point for students. Past research shows that satisfaction with the instructor does translate to satisfaction with

the course and online or hybrid courses have mixed results. For example, Haytko (2001) found that hybrid course evaluations were significantly lower than traditional course evaluations for both the instructor and the course. Students reported dissatisfaction with the interaction with the instructor in the hybrid course though the number of interactions via email was significantly higher than the traditional course. Likewise, Marks, Sibley and Arbaugh (2005) found that instructor-student interaction is the most important thing predicting effective online learning.

H11: Satisfaction with the instructor is positively related to satisfaction with the class.

GPA and Expected Grades

Two variables, which have not had a clear distinction in the literature, are actual GPA and expected grade. While there are mixed findings for GPA as it relates to satisfaction, expected course grade may be a better indicator of satisfaction with an individual course. While Cooke, Sims & Peyrefitte (1995) indicate that these relationships, although interesting to explore, are not important to college marketers since they are not under the direct control of universities, they may be interesting from the instructors' viewpoint. Brodie (1964) reported significantly higher grades for satisfied students. Student satisfaction scores and grade point average were found to be related by Beelick (1973), however, a study by Bowen and Kilmann (1975) found no relationship between student satisfaction and grade point average. Marks, Sibley and Arbaugh (2005) found that the personal variables of age, gender, and GPA were not related significantly to perceptions of learning performance.

H12: GPA is positively related to satisfaction with the class.

Students may also have unrealistic expectations. Cooke, Sims & Peyrefitte (1995) found students are more likely to quit if their education expectations are not met. This is especially true when expectations are disconfirmed. One indicator of what students expect is to examine satisfaction based on performance expectations (i.e. expected grades), as some disciplines, more than others, place much higher demands on students. As is the case in disconfirmation studies, if the expectation of performance is higher than actual performance, the outcome is a low level of satisfaction. As a result, student satisfaction research is one important mechanism for devising retention strategies to meet some of these new concerns. Vamosi, Pierce and Slotkin (2004) found that student satisfaction in an accounting course was significantly lower than expected, primarily because of their lower relative satisfaction with the distance learning delivery mode. The students felt the online components were less interesting and less efficient for learning than the traditional course. Universities invest heavily in programs and support facilities for retention purposes often based on conventional wisdom of the moment. If administrators can clearly identify the antecedents and correlates of student satisfaction, preventive measures may be taken to address shortfalls in the student's level of satisfaction.

H13: Expected grade is positively related to satisfaction with the class

METHODOLOGY

Participants were enrolled in a cross-disciplinary integrated business course conducted as a traditional in-class lecture with the addition of Blackboard/Web-CT. The Blackboard/Web-CT platform was used to handle administrative and communication functions of the class. Students were able to contact the professor and other students via e-mail. Bulletin boards and mass e-mail informed students of new assignments. The course site provided access to assigned reading materials, and general questions and answers about the class policies and projects. The course syllabus, assignment schedules, and web-site links associated with assignments were also posted on the site.

Sample

A census was attempted for all students enrolled in two sections of the course at a state university. The survey was conducted on-line using Perseus Survey Solutions for the Web. Of the 301 students enrolled, 279 usable surveys were returned, resulting in a 93% response rate. The representation of respondents by gender was 135 female and 144 male. Student ages ranged from 18 to 49, with the modal age being 20. Represented in the sample were 83 freshmen, 100 sophomores, 60 juniors, and 36 seniors.

Scale Development

The survey included several multi-item measurement scales to assess the constructs of interest, as well as questions on demographics. All of the multi-item scales were measured using a 7-point Likert type scale anchored with the statements “Strongly Disagree” = 1, “Strongly Agree” = 7, and “Neutral” as the mid-point. The majority of scales were drawn directly from previous research or adapted to meet the requirements of this study (Oliver, 1980; Reilly, 1982; Hackman and Oldham, 1974; Arora, 1982). However, the acceptance of technology construct was difficult to measure using existing scales. Thus, an item pool was identified and reviewed by several experts with knowledge of marketing measures, and the items were revised and reduced to a usable scale after several iterations.

The perceived flexibility scale is developed around the constructs proposed by Arbaugh (2000), including items regarding scheduling flexibility and time for work and non-work activities. Arbaugh (2000) also discussed the importance of “Ease of Use” as an essential element for interpreting student satisfaction in web-enhanced courses. A similar scale was developed with the same construct in mind for measuring the “Ease of Use” of course technology.

Other studies of web-based education have used student satisfaction with the course as the dependent variable (Arbaugh, 2000; Strauss, 1996). The scale for satisfaction with the class was developed from questions in two satisfaction scales. Dubinski and Hartley (1986) developed a scale to measure salespersons’ job satisfaction. Lucas et al. (1987) developed a scale to examine intrinsic job satisfaction. Questions were adapted from both scales for this study.

RESULTS

Factor analysis was used to examine the underlying dimensions of the constructs. Because of interdependence among measures, maximum likelihood extraction with oblique rotation was employed to extract the factors. As expected, when selecting eigenvalues greater than 1, seven factors associated with each of the multi-item dependent and independent variables resulted. Coefficient alphas (Cronbach, 1951) range from .9657 for satisfaction with school to .7899 for ease of use. Total variance explained by the 7 factors is 68.4%.

Measurement Model

The significance of the relationships among the explanatory variables was determined by examining their t-values and standard errors. Table 1 presents the results of the measurement model. Coefficient alphas, factor loadings, standard errors, and t-values are included.

Structural Model

Relationships were tested using LISREL (Joreskog and Sorbaum, 1993). LISREL compares a specified model to a *pxp* covariance matrix incorporating all observed variables, testing for goodness of fit between the model and the matrix. The structural model identifies significant relationships between constructs. For the specified model, R^2 statistics and modification indices revealed that variation among constructs for some paths proved to be statistically insignificant, while other paths were suggested that improved model fit. An additional path was suggested between ease of use and satisfaction with instructor to decrease the chi-square and RMSEA statistics.

Although it was hypothesized that acceptance of technology would be positively related to both flexibility and ease of use, both of these relationships proved to be insignificant. The results of the structural model are presented in Figure 2, which indicates all significant relationships between constructs. The final model with suggested modifications revealed a chi-square of 1029, with 610 degrees of freedom ($p<.001$). Although the goodness of fit statistics indicate a significant chi-square, the sample size and number of variables included in the model revealed that the power associated with the test was .9998 (MacCallum, Browne and Hazuki, 1996), thus making the chi-square statistic suspect. Because the chi-square statistic, along with other fit indices (i.e. GFI and AGFI), are subject to bias resulting from sample size (Babakus, Ferguson, and Joreskog, 1987) and degrees of freedom (Hulland, Chow and Lam, 1996), additional comparisons were required. In this case CFI = .95, NNFI = .94, SRMR = .063, and RMSEA = .049 are within acceptable ranges (Browne and Cudeck, 1993; Hu and Bentler, 1999).

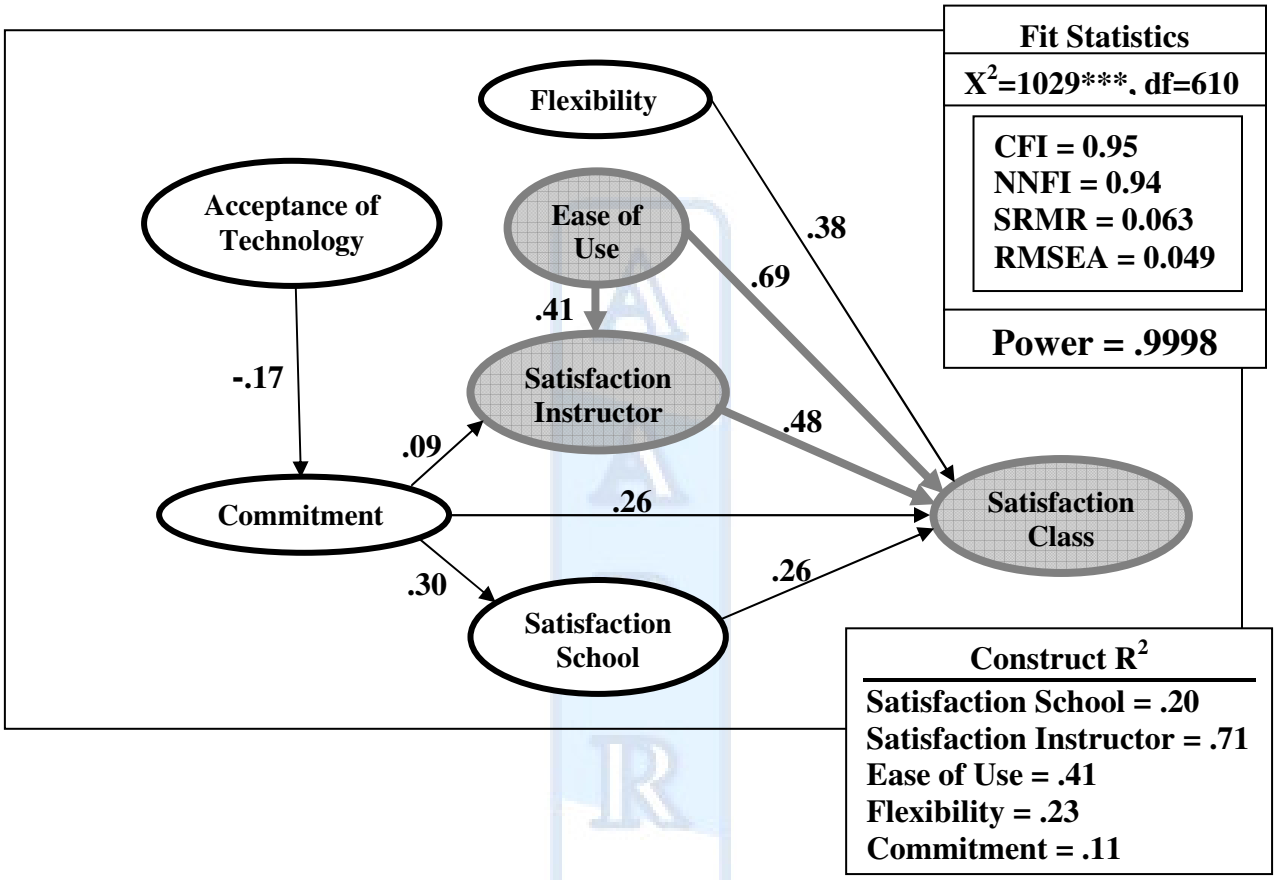
Table 1
Measurement Model Maximum Likelihood Estimates

Construct/Observed Variables	Factor Loading	SE	t-values	Coefficient Alpha	R^2
Satisfaction with Class (Eigenvalue = 11.73, Grand				**.952**	N/
V14 This class provides a satisfying learning experience.	.916	.06	20.21		.86
V13 This class is an interesting one.	.860	.06	18.73		.79
V11 This class does a good job of developing professional	.841	.06	18.41		.77
V15 This class is more satisfying than most other classes.	.797	.07	17.26		.71
V12 I get a feeling of accomplishment from the work I am	.767	.07	16.93		.69
Satisfaction with School (Eigenvalue = 4.43, Grand				**.965**	**.20**
V6 I feel good about my decision to enroll at .	.954	.05	21.05		.92
V7 I think I did the right thing when I decided to enroll at	.920	.06	19.62		.84
V3 I am satisfied with my decision to attend .	.905	.05	19.23		.82
V8 I am happy that I enrolled at .	.885	.06	19.72		.85
V5 My choice to enroll at was a wise one.	.881	.05	19.23		.82
V4 If I had to do it all over again, I would enroll at .	.852	.07	16.86		.70
Acceptance of Technology (Eigenvalue = 3.67, Grand				**.846**	N/
V43 Computers are too complicated.	.784	.08	14.41		.64
V42 I avoid using computers at all costs.	.696	.07	14.94		.68
V46 The Internet is too confusing for me.	.692	.08	12.75		.52
Flexibility (Eigenvalue = 2.63, Grand Mean = 4.51)				**.878**	**.23**
V58 This class gives me flexibility for extracurricular	.845	.08	15.15		.43
V56 This class gives me flexibility for study time.	.825	.08	15.50		.75
V54 My schedule is more flexible because of this class.	.640	.08	11.24		.43
Satisfaction with Instructor (Eigenvalue = 2.0, Grand				**.942**	**.71**
V17 I am satisfied with the amount of guidance I receive	.905	.08	14.84		.81
V16 I am satisfied with the degree of respect I receive from	.783	.08	13.25		.65
V21 I am satisfied with the help I receive from my	.781	.08	13.52		.68
V18 I am satisfied with the quality of instruction I receive	.698	.07	15.26		.86
V19 My instructor provides satisfactory feedback.	.689	.08	14.28		.75
Commitment (Eigenvalue = 1.46, Grand Mean = 5.77)				**.860**	**.11**
V24 I am constantly involved in studying to become a well-	.863	.06	15.82		.69
V25 I have an active interest in all scholarly things.	.775	.07	12.51		.49
V23 I am not one to be contented with an “average” C	.675	.06	12.99		.52
V27 I am committed to getting a good education.	.647	.05	14.15		.59
V26 I keep abreast of current events.	.568	.07	9.68		.33
V22 I believe in studying hard to get good grades.	.559	.06	11.67		.44
Ease of Use (Eigenvalue = 1.22, Grand Mean = 5.65)				**.789**	**.41**
V49 The technology associated with this class is easy to	.742	.07	9.20		.36
V48 It is easy to turn in assignments in this class.	.717	.08	8.55		.31
V52 It is easy to get feedback on grades in this class.	.427	.10	11.39		.55
V53 There are no serious disadvantages to taking this	.395	.09	11.26		.53

Steiger (1990) suggests that a RMSEA value of less than .05 is indicative of close fit. MacCallum, et al. (1996) additionally recommend the use of confidence intervals (CI) to

interpret RMSEA. A very narrow CI associated with RMSEA supports the interpretation of close fit. For this model, the 90% CI range is .043 to .054, a very narrow interval around the estimate.

Figure 2
Structural Model of Student Satisfaction in Web-Enhanced Classes



Note: Significant paths (p<.05) between constructs are shown with standardized beta weights**.** See Table 1 for variables associated with each construct, standard errors, t-values, and R^2.

As hypothesized, figure 2 indicates a positive and significant relationship between satisfaction with class and several of the hypothesized variables, satisfaction with school (B = .26, p<.001), commitment (B = .26, p<.001), satisfaction with instructor (B = .48, p<.001), ease of use (B= .69, p<.001), and flexibility (B = .38, p<.001 Ease of use is also shown to be positively related to satisfaction with instructor (Y = .41, p<.001). Commitment is positively related to satisfaction with school (Y = .30, p<.001) and satisfaction with instructor (Y = .09, p<.05), but has a negative relationship with acceptance of technology (Y = -.17, p<.01).

Additional variables examined with respect to satisfaction included G.P.A., expected grade, and gender. G.P.A. revealed no significant relationship with any of the other variables. Alternatively, expected grade for the class was significantly related to

satisfaction with the class and satisfaction with the instructor for all measures. Correlations for each of the items with expected grade are reported in Table 2.

Table 2
Correlations Expected Grade and Satisfaction with Class

Item	Pearsons R	Asymp. Std. Error	p-value
Satisfaction with Class			
V11 This class does a good job of developing professional growth.	.233	.069	**.001**
V12 I get a feeling of accomplishment from the work I am doing in this class.	.197	.063	**.001**
V14 This class provides a satisfying learning experience.	.203	.064	**.001**
V13 This class is an interesting one.	.225	.068	**.001**
V15 This class is more satisfying than most other classes.	.190	.061	**.008**
Satisfaction with Instructor			
V16 I am satisfied with the degree of respect I receive from my instructor.	.132	.064	**.027**
V17 I am satisfied with the amount of guidance I receive from my instructor.	.245	.060	**.001**
V18 I am satisfied with the quality of instruction I receive from my instructor.	.209	.068	**.001**
V19 My instructor provides satisfactory feedback.	.130	.065	**.029**
V21 I am satisfied with the help I receive from my instructor.	.154	.062	**.010**

Findings also reveal that expected grade in the class is significantly higher (half a letter grade) than cumulative G.P.A.; mean expected grade is 3.61, while mean cumulative G.P.A. is 3.11. A t-test was conducted to examine the difference between G.P.A. and expected grade and the result was significant (t = -12.842, df = 274, p < .001).

To compare gender, respondents were again stratified into 2 groups, male (n = 144) and female (n = 135). A *t*-test was used to compare the respondents on level of satisfaction with the class and level of satisfaction with the instructor. Again, there was a significant effect for both satisfaction with the class (GM_{female} = 5.62, GM_{male} = 5.03, t = -4.16, df = 277, p < .000) and satisfaction with the instructor (GM_{female} = 5.67, GM_{male} = 5.34, t = 2.306, df = 277, p < .022). In both cases, satisfaction with the class and satisfaction with instructor, female students were more satisfied.

DISCUSSION

Consistent with Arbaugh (2005; 2000), significant relationships were found between satisfaction with the class and ease of use. In the context of online courses, Arbaugh's findings suggest that the flexibility of the medium, ease of use, and the development of an interactive course environment play a large role in satisfaction. The current study also found significant relationships between flexibility and satisfaction with the class, and between ease of use and satisfaction with the class. In considering technological characteristics of course design, Arbaugh (2005) recommends the increased use of a variety of media on course websites and claims that the posting of course materials in a variety of formats enhances the web-based course experience and thus, satisfaction.

Marks, Sibley and Arbaugh (2005) found that instructor behavior toward students was the most important explanatory variable in their model of student satisfaction, supporting previous research on the importance of the instructor's role in an online learning environment (Easton, 2003; Martins and Kellermanns, 2004). One of the strongest relationships demonstrated in the current study was between satisfaction with the instructor and satisfaction with the course, suggesting that the students' attitude toward the instructor plays a significant role in overall perceptions of the course.

One explanation for the strong relationship between satisfaction with the class and satisfaction with the instructor may be found in the social interaction literature. Researchers at Carnegie-Mellon (Kraut, Patterson, Lundmark, and Kiesler, et al. 1998) examined the impact of the amount of time spent online with regard to other social involvement. Findings indicated that while users of online technologies reported being pleased with the Internet experience, the more time they spent online, the more negatively they tested on psychological measures of loneliness and depression. This was especially true for teenagers. In another study, Cougar and O'Callaghan (1994) found that people attracted to the computer field have a low need for social interaction. The pedagogical implications of online behavior may play a significant role in changing the dynamics of social interaction. Hanson (2000, p. 104) indicates there is a "lack of social cues" and "sparseness of quality cues" in on-line interactions. These findings are important to student populations given that the ages of traditional students range from 18 to 24, the group most affected by loneliness and depression as a result of spending time on the Internet. In the context of this study and as suggested by several authors, the development of an "interactive course" might be the key to successful on-line offerings. An interactive course offering that promotes either real time or asynchronous communication between the student and the instructor may be necessary for maintaining student satisfaction.

The triad of association among satisfaction with the instructor, ease of use, and satisfaction with the class resulted in the strongest relationships. See Figure 2. This triangle represents attitudinal ideals in students' perceptions of the learning experience. Students want to interact with the instructor, but also want to insure that they can deliver the expected work easily. These findings suggest that perceived ease of use of the technology and satisfaction with the instructor are the most important factors in satisfaction with the class.

The lack of significance for G.P.A. is interesting because in past research, the results of the impact of G.P.A. on satisfaction have shown mixed results (Bowen and Kilmann, 1975; Beelick, 1973; and Brodie, 1964). In the current study no correlations

were found for any satisfaction measure related to G.P.A. In contrast, every measure for expected grade was significant for the satisfaction measures related to the class and to the instructor. The measure of expected grade obviously includes some phenomenon of optimism on the part of the students related to the specific class for which they are expecting the grade. This phenomenon is not captured in the G.P.A. measure.

Qualitative Data

Students in this study are generally satisfied with both the course and the instructor; however, feelings about the perceived ease of use of the technology may be mixed among students. To identify student concerns with the Web-enhanced course structure, students were asked for comments on their experience with the course. Student comments with positive connotations talked about the class as being: 1) “more efficient timewise”, 2) “more flexible”, and 3) “easily accessible”. The negative replies were more extensive and included some of the following comments: 1) “teachers are very hard to reach”, 2) “they [teachers] forget about answering their e-mail” (perhaps because there is so much of it), 3) “I do not want to give up the ability to interact with the instructors”, 4) “Web-CT is a big hassle”, 5) “the server went down…and I lost points”, 6) “I get bored”, 7) “too many errors”, 8) “communication is a problem”, and 9) “I just want to get this less than optimal experience over with.” While some students appear to have positive on-line experiences with Blackboard/Web-CT, many of the students’ comments tend to support the idea that they are having difficulties with the technology. Still others are showing feelings of being removed from interactions with the instructor and are experiencing difficulty in communicating with the instructor. Studies focusing on social interaction, communication, and technological mastery are also needed to investigate the nature of these effects and implications for on-line instruction.

IMPLICATIONS

The implications of this study direct our attention to the differences between asynchronous and synchronous learning techniques. Asynchronous learning can cause problems for students, such as dealing with delays in receiving help or feedback on assignments. Additionally, expectations of immediacy of feedback that students are accustomed to in traditional lecture courses are not met. Providing explicit instructions about what students can expect and establishing an appropriate support network among students is one way to combat this type of asynchronous frustration. However, it is our job to prepare these students for the “real world” where such delays are common. As recently as 20 years ago, students received feedback no earlier than the next time the class met, sometimes a full week later. The advent of the Internet and email has taught them to expect instantaneous responses from instructors, something most of us don’t want to provide.

Synchronous learning, by contrast, provides the opportunity for the Instructor to interact with students. The use of chat rooms, instant messaging, and discussion forums may assist in providing students with the interaction they would otherwise receive in a traditional classroom experience. Harrison and Bergen (2000) recommend that educators foster "a community of learners" among the members of the class. They

recommend that as the first online assignment, students be required to post an introduction for themselves. "This serves to break down some of the isolation that students may feel when they first start the online course" (p. 59).

While this study is useful in providing support for previous research in addition to some new findings, it also has several limitations. The sample is only from two courses and one state university. Obviously, this study should be replicated at other schools, both public and private and with other courses, both traditional and fully-online to determine whether the results hold in these different contexts. We also were unable to study all of the possible variables that impact the satisfaction with e-learning environments and measurement issues will always be present. Future research could expand upon the hypotheses and the specified model to determine what other factors may impact student satisfaction.

There are several important issues raised by this study and in the current literature in relation to technology. Ease of use of the technology and satisfaction with the instructor played a major role in student satisfaction with the course, suggesting that there is a need for intuitive and robust technology that facilitates learning objectives through interactivity across the medium. Atwong and Hugstad (1997, p. 45) stated, "Internet teaching should focus on how information technology can improve learning, that is, on how students can learn more, learn more easily, learn faster, and learn how to learn." These results also suggest that we should be evaluating technology use and understanding in our classrooms. Ferrell and Ferrell (2001) reviewed the literature on student course evaluations and found that almost no items measured student reaction to instructional technology.

CONCLUSION

This study examined the relationship among variables associated with student satisfaction in Web-enhanced courses. Significant relationships are found for satisfaction with instructor, satisfaction with school, ease of use, flexibility, commitment, gender, and expected grade. The triad of relationships among satisfaction with the instructor, ease of use of the technology and satisfaction with the class were of particular interest.

The strong positive relationship between satisfaction with the instructor and satisfaction with the course indicate that these two variables are important to student satisfaction. Ease of use is also strongly correlated to these two variables. However, the authors encountered mixed responses from students in relation to perceived ease of use and acceptance of technology. It is suggested that these responses may be explained by recent research in Web-based consumer studies that found increased depression and reduced social interaction among Internet users. In fact, a recent study found that participant interaction is one of the strongest predictors of success in online environments (Arbaugh and Benbunan-Fich, 2007). Social interactions are an integral part of satisfaction with others and removing opportunities for interaction between the student and instructor may inadvertently reduce a student's satisfaction with the instructor and the class.

In light of the massive expansion in distance education over the past few years, the relationship between the student and the instructor cannot be overlooked.

Satisfaction with the instructor drives satisfaction with online offerings. "Interactive" web-enhanced courses that promote direct contact between the instructor and students, thereby facilitating discussions and real time interactions, may be the key to insuring student satisfaction. Academics should exercise care in how aggressively they embrace technology for distance education, keeping in mind the importance of interaction with their students. Certainly a platform such as Blackboard/Web-CT provides benefits, but it must be employed in a way that leverages the positive features of the educational experience. Educators must not view technology as a replacement for social interaction in their efforts to promote a cheaper, faster means of providing education.

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