

FACTORS ASSOCIATED WITH FACULTY USE OF WEB-BASED INSTRUCTION IN HIGHER EDUCATION

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Abstract

As universities offer courses online, issues related to quality of instruction, faculty roles and incentives, and availability of resources and support are raised. This study examined faculty members' perceptions of factors and issues that support or impede their development and teaching of Web-based courses at Mississippi State University. This measurement of factors concerning the faculty's participation in developing and teaching Web-based courses may lead to improvement in status of web-based instruction (WBI). The researcher found that a majority of the faculty was not using WBI. The low level of WBI implementation was associated with (a) the nature of course content (not all classes are meant for online teaching), (b) lack of administrative support, (c) no release time for development and revisions of online courses, (d) non-reliability of technology, and (e) lack of incentives for teaching online. If the university administration were to implement policies to recognize the importance of WBI while providing adequate support services to faculty, the future could be bright for WBI.

Introduction

While there are many reasons why universities and other teaching institutions should introduce and utilize Web-based instruction (WBI) ("e-learning"), three major reasons stand out: to enhance the quality of learning, to maintain competitive advantage, and to improve access to education and training (Bates, 1997; Inglis, 1999; Oliver, 1999). As universities struggle with increasing costs and decreasing enrollments, distance education can be a lifesaver in extending the reach of the university (Godschalk & Lacey, 2001). Together, distance learning and its relationship to emerging computer technologies offer many promises to higher education, although actual accomplishments often fall short of these promises. Some of the shortcomings are due to problems with the technology; others have more to do with administration, instructional methods, or students (Valentine, 2002). Administrators hope that Web-based methods will help make higher

education more cost-effective (Dibiase, 2000).

While college administrators seem eager to employ distance learning and other technology-related advances, it seems that many (or even most) faculty are less enthusiastic. Reasons for this resistance to technology-based instruction were summed up by Bower (2001, ¶ 3) as "concern for the adequacy of institutional support, the (resultant) changes in interpersonal relationships, and (program/product) quality." Bower concluded that, while technology has the potential to meet many of the challenges facing higher education, administrators must move beyond the Field of Dreams mindset ("If we build it, they will come") and acknowledge and address faculty concerns and encourage faculty participation.

The scope of this study was to examine faculty member's perceptions of factors that support or impede their teaching of online classes. How faculty respond and what they believe can be done to further support the Web-based learning environment is of

interest to faculty development professionals, those working in extended and continuing studies, academic administrators, and policy makers as they construct the college of the 21st century.

Specific Objectives

The ultimate question of this study was: What perceived factors and concerns affect faculty at Mississippi State University in participating, or not, in teaching online?

The specific objectives were:

1. To determine faculty member's use of Web-based technologies.
2. To determine faculty members' perceptions regarding factors and issues related to Web-based instruction.
3. To compare users vs. non-users on the perceived factors and issues.

Design

The research design in this study is classified as descriptive-correlational. This study was an attempt to accurately reflect and describe faculty perceptions regarding factors related to WBI. Fraenkel and Wallen (2002) stated that correlational studies describe the degree to which two or more quantitative variables are related.

Population

The population was faculty members (N = 975) from all academic disciplines at Mississippi State University (a land-grant university with approximately 16,000 students). From this population, a census was conducted. A list of academic faculty and an electronic mailing list was obtained from the Information Technology Services. Faculty members from each department received e-mail via the mailing list and a letter describing the intent of the study and an invitation to participate. The letter was authorized by the university's academic provost and ensured confidentiality of the respondents.

To include faculty who would like to participate, but did not want to respond via the Web-based version, a postcard was

included in the invitation letter indicating they could return the self-addressed postcard to the researcher in order to receive a paper version of the survey. The instrument was distributed via SurveyMonkey® (<http://www.surveymonkey.com/>).

Reminder notices were sent to the study population two and three weeks following the initial mailing. Prior to the mailing, the proposal was submitted to the university's Institutional Review Board for approval. Respondents were given a code to access the survey, so follow-up of nonrespondents could be achieved.

Instrumentation

A questionnaire consisting of 56 questions consisted of quantitative methodology (selected-response survey items) in conjunction with qualitative methodologies (open-ended survey response items) to investigate the difference between those who teach online and those who do not teach online, perceptions regarding factors related to Web-based technology, and the level of users on the perceived factors.

Part I consisted of seven questions, five of which were used to describe the respondents' current level of participation in Web-based instruction. Parts II and III of the survey instrument addressed issues that were characterized as "technological," "pedagogical," and "faculty-centered," which related to computer skills and to attitudes towards certain issues within Web-based learning. Part IV of the instrument contained questions related to demographic information. This survey instrument was comprised of Likert-type questions, scaled items, checklists, and closed-ended and open-ended questions. The survey instrument was considered to have content validity since the survey instrument had been used in three previous studies and had been reviewed and approved by a seven-member panel of experts (Martin, 2003).

Findings

Out of the 925 surveys, 407 were returned, yielding at 44% return rate. Of the respondents, 20 faculty members requested to take the survey via the paper version and

not the electronic version. To control non-response bias, an 8% random sample ($n = 41$) of non-respondents were selected and surveyed via telephone to gather responses on selected questions from the questionnaire. A proportion of responses for the non-respondents were statistically compared to those of the respondents to see if the two groups differed significantly. Of the sample of non-respondents, two faculty members were no longer at the university and five of the faculty were non-teaching faculty. Based on the frame error, the estimated actual response rate was 48%.

Comparisons did not reveal any significant differences among the five questions between the two groups. Since no significant differences were found when the responses of the initial respondents were compared with those of the interview sample, it was assumed that the respondents represented an unbiased sample of all who received the survey.

Participant Demographics

Of the 407 respondents, 26.3% had 1 – 5 years teaching experience at the college/university level, 20.7% had 6 – 10 years of teaching experience; 16.4% had 11 – 15 years of teaching experience, 15.4% had 16 – 20 years of teaching experience, and 21.2% had over 20 years of teaching experience. It was interesting to note that the novice and veteran faculty were the larger two groups to respond to the survey.

Among the faculty ranks, the majority of respondents were either full professors (32%) or assistant professors (28%) while 27.6% were non-tenured and 72.4% were tenured. The highest academic degree among faculty reported was a doctorate degree (80.4%) followed by a much smaller number of masters degrees at 16.1%.

Faculty indicated a wide range of specialization areas (content areas) of teaching. The largest numbers reported were Plant and Soil Sciences (3.9%) and English (3.4%).

Use of Web-Based Instruction

Eighty-one percent of respondents indicated that they had not taught a class

delivered exclusively through the Web, while 19% reported that they had taught using this technology.

Among those who did teach courses via the Web, most of the Web-based courses were taught at the undergraduate, upper and lower levels. The largest percentage of courses taught at the undergraduate, upper level was “1” course (26%) and at the undergraduate, lower level was also “1” course at 20.8%. Those teaching at the graduate level (16.9%) indicated that they were teaching “1” course just as those at the undergraduate levels.

Of the 407 respondents, 45.5% reported that they “possibly” would use online technology to deliver Web-based courses in the future while 30.1% said “yes” they would use this technology, and 24.4% reported they would not use online technology in the future. Additionally, 47.6% of the respondents indicated that it is “not important” to offer Web based academic courses. The percentage of faculty members indicating “important” was 36.2%, followed by “very important at 16.2%.

One question was open-ended and asked for two primary reasons they plan to use online technology to deliver instruction in the future. Responses varied, but the top three reasons were the potential to reach students that cannot be in an on-campus environment, flexibility and control of time (both for the instructor and the student), and as an effective way to both transmit knowledge and information.

One question was open-ended and asked for two primary reasons they plan to not use online technology to deliver instruction in the future. The most given responses were that faculty felt that the face-to-face instruction and interaction was much more effective than online (personal interaction between student-teacher and student-student, hands-on nature of instruction, direct observations, etc.); no incentives or rewards for the effort involved in teaching online courses, and technology problems by the faculty and the students.

Perceptions Regarding Factors Related to Web-based Instruction
Potential factors were determined based on previous research by Martin (2003)

and categorized as “technological,” “pedagogical,” and “faculty-centered.” A summary is shown in Table 1.

Table 1
The Importance of Technological, Pedagogical, and Faculty-Centered Factors related to Implementation of Online Courses

Factor	M^a	SD	N
Technological			
Reliability of technology	4.29	1.06	389
Technical support	4.27	1.03	390
Course development/revision time	4.26	1.05	391
Hardware/software availability	4.09	1.10	388
Connectivity issues/problems	3.95	1.18	389
Network security	3.69	1.23	389
Pace of technological change	3.56	1.18	388
Privacy rights	3.46	1.30	390
Other			
Pedagogical			
Nature of course content	4.34	.93	387
Course objectives	4.11	1.00	385
Class discussion	4.08	1.05	384
Methods of evaluation and assessment	3.95	1.09	383
Depersonalization of instruction	3.78	1.27	383
Other			
Faculty-Centered			
Faculty load or release time	3.93	1.20	383
Level of administrative support	3.93	1.13	383
Control of curriculum	3.62	1.20	383
Institutional reward system	3.52	1.37	383
Annual performance review	3.47	1.31	382
Promotion and tenure	3.16	1.46	382
Intellectual property/ownership rights	3.05	1.37	383
Other			

^a Scale: 1 = Not Important, 2 = Little Importance, 3 = Neutral, 4 = Important, 5 = Very Important

Technological factors. The highest level of agreement was for the factor “reliability of technology” ($M = 4.29$). Other technological factors included things such as “classrooms that have shades over the windows and central air-conditioning so the window units don't drown-out the technology,” “compatibility with Mac OSX,

hardware/software availability for students—very important, support staff to back it up, the server is critical—the site must run well,” and “ADEQUATE training in the software and in-office time is essential.” Privacy rights received the lowest rating indicating that if technology were dependable and time were allotted for course

development that more faculty would teach online.”

Pedagogical factors. In this set of factors, “nature of course content” had the highest mean of ($M = 4.34$). Some of the other pedagogical factors reported were “the ease for student procrastination, inability to have lab instruction, interaction between students, cheating, plagiarism, and personal interaction with students – it is no substitution for face-to-face.”

Faculty-centered factors. Responses revealed the highest level of importance was “level of administrative support” and “faculty load or release time” ($M = 3.93$). Other faculty-centered factors included “never receive credit for EXTRA time spent, commitment to teaching and good teaching are not rewarded during P&T, mindset of IHL—once the course is ‘in the can’ the instructor is not needed, and student expectations (is this a 24/7 job now?).

Perceptions Regarding Issues Related to Web-based Instruction

This part of the survey concerned the level of agreement that respondents had with issues identified from previously reported research findings. A summary is shown in Table 2.

Concerning institutional issues, “lack of incentives for teaching classes online is an

obstacle to delivery of online instruction” received the highest level of agreement ($M = 3.10$). Faculty responses indicated that the university wanted faculty to develop online courses, but was not providing incentives and rewards for their efforts.

Of the “technical” issues, “adequate support systems is a major concern” received the highest level of agreement ($M = 2.97$). This finding indicated that faculty knew about online technology but felt that they did not have the necessary support (staff, training, software/ hardware) to invest their time in the effort of Web-based teaching.

In the “faculty-centered” issues, “Web-based delivery is not appropriate for all courses” received the highest ranking of agreement ($M = 3.52$). These data are supported throughout the study in that a majority of the faculty felt that Web-based delivery is not appropriate for all courses. For example, science faculty were adamant about hands-on lab experiences and the faculty in the teacher education program felt that in order for students to learn how to become a schoolteacher and teach other students, that face-to-face instruction was a necessity. Faculty members were adamant about the fact that all courses are not meant for online teaching.

Table 2
Levels of Agreement on Institutional, Technical, and Faculty-Centered Issues Concerning the Implementation of Online Courses by Rank Order of Perceived Importance

Issue	M^a	SD	N
Institutional			
Lack of incentives for teaching classes online is an obstacle to delivery of online instruction	3.10	.82	305
Lack of clear institutional policies on the use of online technology affects its adoption by faculty	2.80	.79	262
Classroom based courses and online courses are given the same weight in terms of faculty load	2.74	.99	228
University doesn't encourage faculty to develop online courses	2.56	.82	290
Technical			
Adequate support systems is major concern	2.97	.83	335
Online learning technology is difficult to use without proper training	2.87	.82	347
Problems with equipment is major concern	2.83	.88	335
Lack of technical knowledge to handle online learning technology and equipment	2.63	.85	337
Lack of adequate information about online learning technology	2.58	.82	322
Faculty-Centered			
Web-based delivery is not appropriate for all courses	3.52	.57	364
Time commitment is greater for online class prep, delivery, and revision	3.19	.80	323
Cheating in an online course is a common threat to quality of online courses	3.02	.86	294
Teacher-student interaction is difficult when using online technology	2.85	.83	328
Online teaching lacks cohesion or sense of community	2.86	.82	340
No complete control of his/her intellectual property with online courses	2.56	.79	293
Students taught online perform as well as those taught face-to-face	2.38	.82	187
Online delivery of instruction is least as effective as teaching face-to-face	1.96	.91	325
Discussion content and quality are better in the online courses	1.87	.69	300

^a Scale: 1 = strongly disagree to 4 = strongly agree

*Comparison of Users and Non-users
on Factors and Issues*

When respondents were asked to indicate the importance of offering Web-based academic courses in their disciplines, 48% reported that offering Web-based academic courses is not important, 36% reported that it is important, and 16% reported that it is very important. When respondents were asked to explain the reason for their selection in the previous question, the responses ranged from those who had positive comments and felt Web-based academic courses were important –

“Time and opportunity are critical factors in encouraging the non-traditional student (whose numbers are ever increasing) to use Web-based classes. If the university is to be competitive in today's higher education market, it is imperative that we make a serious commitment to developing this avenue of delivery of instruction. The community college consortium is well ahead of the university members of IHL in this state at this time. Our state is behind in its organization and commitment to this avenue of learning when compared with other states who pride themselves in serving the greater public with educational opportunities,”

to those respondents who felt it was not important – “No reward system for developing the classes, little technical support, face to face is important in some counseling classes,” and

“My task is to teach my students well, not keep up with the technological Joneses. Turning to online instruction as a way to teach better is like buying gym equipment to get in shape: it's novel and interesting (and expensive), but does it really get the job done? Not necessarily. Good teachers get the job done, just as motivated people get in shape with or without the fancy gym equipment.”

Of the eight statements concerning technical factors, users and non-users had the greatest mean difference in the “Reliability of technology” ($MD = .43$)

followed by “Hardware/software availability” ($MD = .42$). Of the five pedagogical factors, these groups had the greatest mean difference in “The depersonalization of instruction” ($MD = -.77$). Among the seven faculty-centered factors “Control of the curriculum” ($MD = .42$) had the largest mean difference.

Among the institutional, technical, and faculty-centered “issues,” the largest mean difference was found in “Lack of incentives for teaching classes online...” ($MD = .24$). Of the technical issues, the largest mean difference was found in “Online technology limits the use of demonstration” ($MD = -.45$). Faculty-centered issues revealed the largest mean difference with “Online teaching lacks cohesion” ($MD = -.76$), followed by two mean differences that were relatively high compared with others – those being “Students taught online perform as least as well as those taught in traditional face-to-face classroom” ($MD = .66$) and “Teacher-student interaction is difficult when using online technology to deliver instruction” ($MD = -.56$).

Of the respondents who had not taught a class delivered exclusively through the Web, 52.8% said they would “possibly” use online technology to deliver Web-based courses in the future, 29.6% said they “would not” use online technology to deliver Web-based courses in the future, and 17.6% said they would use online technology in the future. Respondents who had taught courses exclusively through the Web, 15.6% indicated they would “possibly” continue to use technology; 81.8% reported “yes,” and 2.6% said they “would not” use online technology in the future to deliver Web-based courses.

The primary reasons given for planning to use online technology to deliver Web-based instruction was that it reduces the time involved in disseminating information and grading assignments, cuts cost to the department (paper, copying, etc.), allows constant contact with the students, provides flexibility and control of time and students can learn at their own pace, and it can accommodate a larger number of students than can be served through the traditional class. The primary reasons given for why faculty do not plan to use technology to

deliver Web-based instruction were lack of experience or knowledge of Web-based resources, students need contact with the instructor, some material is not conducive to Web implementation, preparation time involved, difficulty in quality control of students, no one has ever asked the faculty to teach a Web course, and no incentives.

Respondents who said they do not teach through the Web, indicated they felt it was "not important" (55.8%); 33.3% felt it was "important," and 10.9% said it was "very important." Respondents who do teach via the Web, indicated it was "important" (47.2%); 38.9% felt it was "very important," while 13.9% said it was "not important," thus indicating that it is very unlikely that faculty will begin to use Web-based technology because they do not feel its importance.

Conclusions, Implications, and Recommendations

Most faculty members were not using WBI. Of those that were using WBI, the majority used WebCT. Faculty members who are using WBI have been doing so for a short period of time and on a small scale (usually 1 class per semester). This university, therefore, could be classified as an institution in the beginning stages of WBI.

However, faculty were open to its use in the future. A majority said they would or possibly would use WBI in the future, and another majority indicated that WBI is important.

In an effort to increase student enrollment and better serve non-traditional students through WBI, online teaching must be recognized for promotion and tenure just as research, publishing, and outreach are currently considered. Factors such as this should be taken into consideration by policy makers in the selection of faculty and administrators who will implement online courses.

Upper administration should express their desires and expectations of faculty and department heads as to the future of Web-based instruction through an institutional policy on use of online technology. Currently, there is no such policy in place.

Therefore, departments are making the choices without a clear understanding about the future investment in online courses. Once a policy has been put in place by upper administration and handed down to the faculty, administration must discover ways to support and reward faculty for their efforts. As one faculty member responded, "It is not clear to the faculty that Web-based courses are really better in the 'big picture' of higher education outcomes. Keeping up with new trends is not always a good thing unless it is very clear that the trend is in a beneficial direction. The pros and cons of Web-based courses need to be laid out -- with empirical documentation -- to honestly convince faculty and administrators that this movement is beneficial, and, if so, how far it should go."

Faculty perceived the most important factors in offering WBI to be: 1) faculty course development/revision time, 2) all courses are not meant to be taught online (face-to-face vs. online), 3) support by administration, 4) faculty load or release time, and 5) lack of incentives for teaching classes online.

Knowledge of these five factors could help administrators and faculty identify and address implementation issues related to online course delivery. Faculty and administrators who have positive attitudes about WBI should be reinforced for their attitudes by the introduction of incentives and the removal of barriers. For those who have negative attitudes, they should be shown the advantage of WBI, educated through lectures, seminars, and attendance at training sessions provided by the university. If this does not happen, the university will remain in turmoil with each department "doing their own thing," with no continuity or consistency among the faculty, administration or throughout the campus.

Upper administrations should decide if WBI is an investment they are willing to pursue and provide resources for success. An additional survey could be used so that perspectives of administrators could be compared to those of the faculty's. Research indicates that administrators and faculty do not share the same views with regards to factors and issues associated with WBI.

The university could re-evaluate the time requirement for developing online classes in comparison to regular classes. Faculty indicated that course development/revision time is greater for online courses, although they are given the same weight for faculty load.

The university could entice faculty to develop online courses by offering an incentive plan. This could be in the form of release time, software, monetary rewards, promotion, etc.

Support systems could be utilized to the full extent by the faculty when developing online courses. Assistance is needed for faculty not only with the technical aspects of course development but also with instructional design principles and practices. Administration could also take part in the prep courses to have a better understanding of what is required by the faculty to prepare and deliver online courses.

Until faculty can see the importance of WBI, which must be provided to them via the administration, online course offerings will continue to be low. Faculty who do not teach exclusively via the Web believe that face-to-face instruction is by far the best instructional delivery method and that all courses are not suitable for web-based instruction.

Discussion

The results of this study supported much of the current literature on WBI. Faculty may ask, "What's in it for me?" The question is not necessarily an easy one to answer because the issues of motivation and work satisfaction are complex. The answer depends on a number of factors that are different from one individual to another, as well as from program to program and institution to institution. The Southern Regional Education Board has launched an Adult Learning Campaign for 16 states in the region. The campaign has three components: marketing, expanding the use of online and distance learning, and building state capacity to serve adults. "The campaign is important because adults will make up the workforce of the future," said Angela Birkes, the campaign's associate director. These remarks would lead one to

believe that it is now time for administrators and faculty to form an alliance and decide the importance of technology in the big scheme of things and "get in the game" or "stay behind" forever.

Encouraging faculty to participate in distance education involves the interaction of a number of variables including an individual's level of motivation, personal values, institutional values, and intrinsic and extrinsic rewards.

Parallels with earlier studies are indicated in the responses on several issues:

Technical issues – While faculty members may be experts in their content areas, faculty who do not use online technology (and even some of the faculty who do) are reluctant to experiment with this teaching process. According to this study, a couple of reasons for this reluctance is that faculty do not feel that they can rely on the technology nor that technical support is available. Faculty indicated that they do 'know' about online technology but felt they do not have the adequate support necessary (support staff, training, software/hardware) to invest their time in the effort of Web-based teaching. Cravener (1999) supports the thought that faculty are often challenged to develop WBI without sufficient technical support, equipment, and software. Both Martin (2003) and Ndahi (1998) reported in their studies that online courses require a supportive system that teaches the faculty member the appropriate techniques for instruction online; Schifter (2000) and Bednar and Charles (1999) found the need for support infrastructure and faculty concern for the time required to develop or prepare distance education courses were of major importance as faculty decided whether to participate in online education.

Pedagogical issues – The major issues in this area was with the nature of course content. Faculty strongly favored the notion that the traditional face-to-face classroom teaching could not be replaced by online teaching. In Murphy and Dooley's (2001) study among agricultural educators, face-to-face contact over technology was held in higher regards than rewards and incentives. Nania (1999) found that selection of appropriate content for online teaching was

a key factor in the successful delivery of online materials. It should also be noted that many non-users have used online technology as a way of supplementing their classroom curricula and providing information in an alternate route to their students. It would be hopeful that as faculty members engage in this “supplemental” period with online teaching, that the advantages will rear their heads and the faculty member will teach the course completely online.

Faculty-centered issues – In this study, faculty load/release time and level of administrative support were the two top issues involved in faculty’s decision to implement online courses. Faculty members were concerned with the amount of time necessary to transfer a traditional classroom course to an online course format. This issue alone plays into several factors associated with the implementation of online courses by faculty. One is the perception that faculty are not recognized for their technology/online efforts when the decisions for promotion/tenure are being made. Two, financial incentives currently exist for published research, excellence in the on-campus classroom, and effective outreach programs, so faculty perceive that they face a risk of losing those incentives when making even a partial, long-term commitment to online courses. So rather than take the risks, faculty simply avoid online teaching or course creation until they have secured tenure/promotions. Three, as research institutions attempt to grow online course offerings, administration may need to make necessary changes in the faculty organizational and governance structure. One such change could be that a faculty member’s research obligations be substituted for time that faculty need to develop course materials as well as alternatives for tenure, workload, and incentives.

In Schifter’s (2000) study, this research data is refuted. Schifter found that faculty were not as much interested in the extrinsic (financial, tenure, promotion) factors or incentives from the institution as they were the intrinsic reasons, such as opportunities for new experiences, access to non-traditional learners, and opportunities to

improve their teaching. Betts (1998) validates Schifter’s responses in her study as well, discovering a similar set of factors for faculty participation in teaching online.

Institutional issues – Lack of incentives for teaching classes online was a major issue in this study and in two previous studies (Martin, 2003; Ndahi, 1998). All three studies revealed that “incentives” could be in various forms – release time, supplemental pay, new equipment, reduced faculty load, etc.). However, Murphy and Dooley (2001) found that concern over the ineffectiveness of technology had a greater impact on faculty than proposed rewards and incentives. They concluded that faculty did not see an apparent audience for Web-based instruction and therefore did not consider the time and effort required for integration of technology worth the effort.

Another institutional issue was that a clear institutional policy on the use of online technology was lacking. Dibiase (2000) found that instructors worry about putting their course materials online because once there, the knowledge and course design skill in the materials are out of their possession. The administration can then hire less skilled and cheaper workers to deliver the technologically prepackaged course. Other concerns faculty had included the standards of the courses offered, accountability, testing security and intellectual property rights.

To recruit and maintain motivated faculty, institutions must offer valued incentives, eliminate disincentives, and provide equitable rewards for online teaching. WBI is not a replacement for the traditional face-to-face classroom teaching but an additional tool for instructors to reach students in distant places. Like all technology, Web-based learning has its own advantages and disadvantages. However, the success of its implementation rests on the willingness of faculty members to use the technology and the institutional support rendered to faculty.

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