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INFLUENCES AFFECTING ADOPTION
OF WEB-BASED COURSE MATERIALS

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Abstract

Web-based materials have been growing in popularity since 1993 when Web browsers became widely available and opened the resources of the Internet to a wide audience. Many people believe the accessibility of the Web makes it ideal for any time / any place education. Yet faculty are divided concerning the efficacy of Web-based education.

While the popular infatuation with the World Wide Web is a real presence, faculty decide on the delivery method for a course based upon their own capabilities, their students’ capabilities, and the infrastructure that supports the delivery method. The acceptance of such a pervasive technology as the WWW into a college course can be a complicated decision for many faculty. A major influence in the decision is the impact that development of Web-based materials have on the faculty member’s promotion and tenure.

Introduction

The Internet Software Consortium has performed a number of domain surveys since 1993 (www.isc.org/ds/) and has found that the number of host computers grew from just over one million in January of 1993 to above 93 million by July of 2000. With each new host there is another repository of content for Web surfers to consume. Nua Internet Surveys (www.nua.ie) expects the number of colleges and universities offering Web-based courses to increase from 1,500 in 2000 to over 3,300 in 2004. Clearly there is tremendous momentum for making Web-based learning materials available for college courses.

Yet there is little empirical evidence that the Web-delivered courses are any better or worse than traditionally delivered college course materials. Anecdotal evidence from instructors who teach both Web-based and traditionally taught classes shows that the learning outcomes are generally the same for each method. College faculty reflect this ambiguity towards Web-based courses.

A recent survey at the University of North Carolina at Wilmington (with a publicly stated goal for increasing Web-based courses) shows that the faculty’s response are mixed concerning Web-based courses (see Table 1). The response from faculty, 32%, was that they “don’t know” if Web-based learning is equivalent to learning from direct classroom instruction. 28% agree that Web-based and direct classroom instruction offer equivalent learning experiences and 27% disagree. The remaining 14% neither agree or disagree that Web-based instruction is equivalent to direct classroom instruction. These mixed signals influence a faculty member’s decision to develop a Web-based course or even Web-based course materials.

The technology acceptance model (TAM) has been frequently used to analyze the acceptance and use of technology. The original TAM design (Davis, 1989) established weights of two factors (perceived ease of use and perceived usefulness) on a subject’s intent to use technology. Then he established that the intent to use technology was significantly correlated with actual use.

This research uses the extended technology acceptance model published by Venkatesh and Davis in 1996 (Figure 1). There are two important extensions of this research to the external variables of the Venkatesh-Davis model: (a) a focus on developers of materials for consumption by end users as opposed to end users themselves and (b) establishing a set of quantitative measures of antecedents to augment the standard qualitative measures used in previous research.
Previous Research

The adoption of technology depends upon a number of circumstances. A potential user must learn of the technology and this learning occurs more efficiently when there is direct contact between a potential adopter and someone who has already adopted the technology. Also, adoption is impacted if the technology is irreversible or exclusive of currently used technology (Jensen 1983, Jensen 1988). For college faculty, the direct contact can often occur through interactions at professional meetings. Swan and Newell (1995) show these networking interactions are important although national and regional difference may mediate the importance.

Faculty are part of the academic community and these professional meetings allow for opportunistic learning. Adopters of Web-based materials and faculty offering Web-based courses interact at these meetings and can provide a sense of community that extends beyond the boundary of their own campus. This feeling of community is important for the effective diffusion of technology (Storck and Hill, 2000). The societal/community aspect of adopters of technology is important. One facet of the societal/community aspect is that certain rewards for development of Web-based learning materials (such as tenure and promotion) can be vetoed by a variety of sub-communities in the developer’s university.

There is an informational influence (e.g. interactions at professional meetings) but also normative influences that must be considered when trying to understand technology adoption (Burnkrant and Cousineau, 1975). Faculty are under pressure from both their administrators and other faculty members in their decision to use Web-based course materials. Untenured faculty are generally younger and have the most current skills with Web materials so they might naturally be assumed to support Web-based classes. Yet these faculty can be heavily influenced by their peers and those peers may oppose Web-based courses.

Davis (1989) proposed that technology acceptance could be studied based upon the technology’s ease of use and its perceived usefulness. The work centered on the technology of e-mail and others have extended the model in recent years (Gefen and Straub, 1997 as well as Venkatesh and Davis, 1996). The technology acceptance model (TAM) is a well tested model to use as a basis for studying the acceptance of Web-based courses into university curricula.

Methodology

A survey has been designed and is currently being tested on a limited group of faculty. The initial survey was administered to a select group of respondents to solicit feedback on the survey content and design. [The survey is at http://152.20.63.10/aspschellg/online.htm] The survey captures demographic information about the respondent, the respondent’s university, and the acceptance of Web-based learning materials by the respondent’s departmental colleagues, chair, school administration, university tenure committee, and university administration. The finished survey will be distributed via listservs during the summer of 2001.

Technology acceptance model research has been an evolutionary process. Regression analysis was used first but the strength of the relationships and small amount of variance explained meant that this method was soon augmented. A large number of measures of “ease of use” and “usefulness” were captured and the data were subjected to factor analysis to hopefully provide stronger measures of intent to use technology. These methods have given way to structural equation models of the TAM data.

Path analysis using linear structural relations (often with a statistical package such as LISREL) is the current analysis method of choice. The survey instrument developed for this research was influenced by two earlier survey instruments that are widely cited; Jarvenpaa and Ives (1991) and also Moore and Benbasat (1991). Path analysis methods will be used to analyze the data collected by the survey in order to establish the models predictive powers compared to recent research. Beyond that analysis, a regression analysis will be performed to see if the inclusion of quantitative measures improves the amount of variance explained by predictive techniques.

Hypotheses and Early Results

The data will be analyzed to test the hypotheses below. At present, there is little research on technology acceptance by people who develop technology to be consumed (as opposed to the end consumers of the technology). There needs to be research on the acceptance of Web-based learning materials by faculty in order to bring rational decisions to the allocation of resources for Web-based courses. Several of the main hypotheses to be explored are listed below.
H$_0$: The amount of financial and non-financial support for development of Web-based learning materials will not significantly affect a faculty member’s decision to develop such material.

H$_1$: Faculty who develop Web-based learning materials will believe they are equivalent to or better than traditionally delivered materials.

H$_2$: University demographics will not affect attitudes towards Web-based learning materials.

H$_3$: Teaching expectations for promotion and tenure will positively affect decisions to develop Web-based learning materials and (as opposed to research expectations) are more likely to develop Web-based learning material.

Due to the small sample size surveyed by the time of submission, statistically significant results are not possible. The data so far suggest that faculty who develop Web-based learning material feel that such materials should have a strong, positive effect on promotion and tenure decisions. They also believe Web-based materials are at least equivalent to directly delivered learning materials. Since the current survey respondents are from a single university, no conclusions can be made concerning financial and non-financial support levels or for university demographics affects.

References


Web References
