

Exploring the Role of Web 2.0 Applications in Higher Education

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Abstract

While students are embracing emerging technologies, such as text messaging, YouTube, wikis, social networks, and other Web 2.0 technologies, this is not the case with many university faculty. Also, many student uses are primarily social. This paper assesses both student and faculty awareness of the benefits of Web 2.0 to supplement in-class learning and better understand student and faculty decisions to adopt these tools using the Decomposed Theory of Planned Behavior (DTPB). The findings indicate that while some students and faculty members feel that some Web 2.0 technologies could improve learning, interaction with faculty and with other peers, writing abilities, and satisfaction with courses, only a few choose to use them for instructional purposes. In order to better understand the factors leading to Web 2.0 use to supplement learning, the study applied the DTPB. The results indicated that student and faculty attitudes and their perceived behavioral control are strong indicators of their intention to use Web 2.0. A number of implications are drawn, highlighting how the use of Web 2.0 could be useful in the classroom.

Background Concepts

Internet technologies, such as e-mail, course Web sites, and newsgroups have added value to traditional classroom knowledge delivery and have impacted the course delivery and design in many colleges and universities (Barnett et al., 2004). In the past few years, a new wave of Internet technologies, Web 2.0, has emerged with the potential to further enhance the teaching and learning environment in higher education. With the use of Web 2.0, students no longer access the Web only for course information; instead, they access and create collective knowledge through social interactions (Maloney, 2007). Now, the use of Web 2.0 enables students to connect different pieces of information and create new information that could be shared with others (Maloney, 2007).

Many studies in the past have shown that technology use in the classroom has increased over the past years; however, this use has been primarily limited to content delivery, such as accessing course materials (Maloney, 2007). Because of this, coupled with the emergence of Web 2.0 technologies into the everyday life of students, it is important to explore faculty use of Web 2.0 technologies to support teaching and learning in higher education. This paper assesses student and faculty awareness of the potential of Web 2.0 technologies to supplement the classroom learning and to assess their adoption of such technologies using the Decomposed Theory of Planned Behavior (DTPB) as the theoretical foundation (Taylor and Todd, 1995). The following two research questions were addressed in this study:

Research Question 1: Are university students and faculty aware of the benefits of using Web 2.0 technologies to supplement the traditional classroom instruction?

Research Question 2: What factors best predict faculty and student decisions to use Web 2.0 technologies to supplement traditional classroom instruction?

Theoretical Framework

In an effort to understand student and faculty intentions to use Web 2.0 applications, this study employs the DTPB as its theoretical framework (Taylor and Todd, 1995). The DTPB is an extension of the theory of planned behavior, which suggests that a combination of behavioral intention and perceived behavioral control determine one's actions (Ajzen, 1991). The decomposed theory of planned behavior, like the theory of planned behavior, asserts that behavioral intention determines behavior and that attitude, subjective norms, and perceived behavioral control are direct determinants of behavioral intention. The DTPB extends this idea and posits that attitude, subjective norms, and perceived behavioral control are all decomposed into lower-level belief constructs, allowing us to better understand the antecedents' relationship and to more specifically examine factors that impact the adoption and use of new technologies (Taylor and Todd, 1995). For these reasons, we decided to adopt the DTPB model (**Figure 1**) to explain student and faculty adoption intention and the use of Web 2.0 technologies to supplement in-class learning.

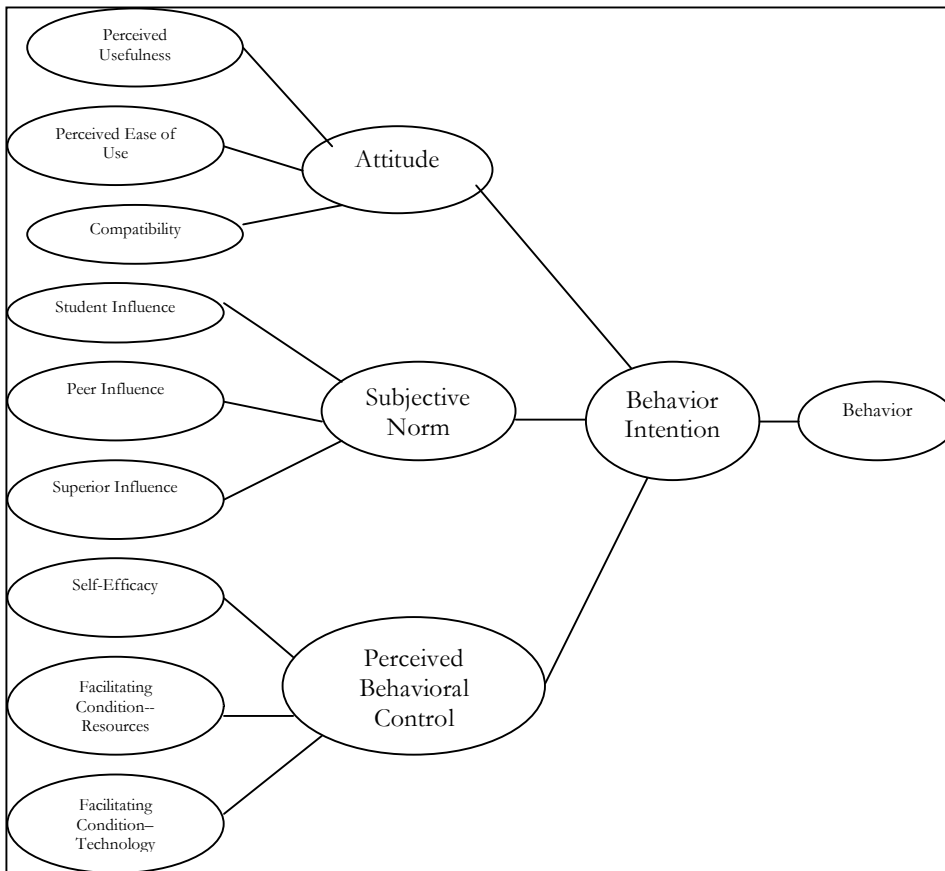


Figure 1. The Decomposed Theory of Planned Behavior

Methods

Participants

To determine the intention of student and faculty that use Web 2.0 technologies as tools in their courses, a survey was conducted during the fall 2007 semester. The participants in this study consisted of undergraduate and graduate students as well as instructional personnel at a large university in the southeastern United States. Participation in the survey was completely voluntary and was open to all students and instructional personnel at the university. In total, there were 136 faculty participants and 423 student participants.

Instruments

Two survey instruments, one for each group of participants, were designed using the DTPB as its guiding framework. Survey items were adapted from previous studies (Baylor and Ritchie, 2002; Taylor and Todd, 1995) and focused on items exploring comfort level with Web 2.0 technologies (e.g., blogs, wikis, and social networking software), actual usage of specific Web 2.0 technologies to supplement in-class learning for students and teaching for faculty, and attitudes toward specific Web 2.0 technologies. Additionally, the instruments consisted of a series of items using a five point Likert-scale (strongly disagree to strongly agree) to examine factors that influence faculty and student intentions to utilize Web 2.0 technologies in their courses. Items focused on areas of actual usage, behavioral intention, attitude, ease of use, perceived usefulness, subjective norms, perceived behavioral control, peer influence, superior influence, student influence, compatibility, facilitating conditions (technology and resources), and self-efficacy.

Findings

The first question examined if, and to what extent, students and faculty are aware of pedagogical benefits of Web 2.0 technologies. The faculty respondents felt that the use of different Web 2.0 technologies to supplement in-class learning could provide their students with numerous benefits (**Table 1**). In terms of Web 2.0 technologies that would improve student learning, 47% of the faculty felt that the use of blogs would improve learning, 42% felt that way about wikis, and 16% felt that way about social networking. About 46% felt that the use of blogs would increase the interaction between faculty and students, 23% felt that the same benefits would be attained from using wikis, and 16% felt that about the use of social networking. In terms of increasing student-student interactions within the course, 52% felt that using blogs would, 20% opted for wikis, and 56% went with social networks. In terms of improving student satisfaction with the course, 39% felt that the use of blogs would improve it, 32% felt the use of social networking would, and 22% felt the use of wikis would. About 41% of the respondents felt that the use of blogs would improve student writing, while 29% felt the use of wikis would help with that.

The student respondents felt that the use of Web 2.0 technologies to supplement their in-class learning would help improve their learning (**Table 2**). Sixty-nine percent of the students felt that the use of wikis would improve their learning, 27% felt that way about blogs, and 21% felt that social networking would help. About 27% felt that the use of blogs would increase the interaction between faculty and students, 24% felt that the same benefits would be attained from using social networking, and 14% felt that about the use of wikis. In terms of increasing student-student interactions within the course, 62% felt that the use of social networks would, 28% felt the use of wikis would and 27% felt the use of blogs would help. In terms of increasing their satisfaction with the course, 28% felt that the use of wikis would, 23% felt the use of blogs would, and 19% felt the use

of social networks would. About 34% of the respondents felt that the use of blogs would improve students writing, while 29% felt the use of wikis would help with that.

Table 1. Faculty Perceptions of the Pedagogical Benefits of Web 2.0 Applications

	Improve student learning	Increase student-faculty interaction	Increase student-student interaction	Improve student satisfaction with course	Improve student writing
Blogs	47%	46%	52%	39%	41%
Wikis	42%	23%	20%	22%	29%
Social Networks	16%	16%	56%	32%	8%

Table 2. Student Perceptions of the Pedagogical Benefits of Web 2.0 Applications

	Improve student learning	Increase student-faculty interaction	Increase student-student interaction	Improve student satisfaction with course	Improve student writing
Blogs	27%	27%	27%	23%	34%
Wikis	69%	14%	28%	28%	29%
Social Networks	21%	24%	62%	19%	15%

Although several student and faculty respondents felt that Web 2.0 technologies provide many benefits, only few chose to use them (**Tables 3 and 4**). In fact 56% of the faculty did not use wikis and did not plan to use them in the near future, and only 20% use them occasionally in their classroom to supplement their in-class lectures. Also, 62% don't use blogs and plan not to use them and only 9% use them occasionally. Similarly, 74% don't use and don't plan to use social networking, and only 6% use it occasionally.

Similarly, with students, 56% do not use, and do not plan to use, blogs to supplement their in-class instruction and only 24% use them either occasionally or frequently. Forty-six percent of students do not use or do not plan to use social networks as instructional tools, while 23% use them either occasionally or frequently. More promising, though, is the use of wikis. While 20% of respondents do not use and do not plan to use wikis, 58% currently use them in some manner.

Table 3. Faculty Use of Web 2.0 Applications

	Don't use and don't plan to use	Don't use but plan to use	Use occasionally	Frequently use
Blogs	62%	18%	9%	5%
Wikis	56%	13%	20%	4%
Social Networking	74%	15%	6%	1%

Table 4. Student Use of Web 2.0 Applications

	Don't use and don't plan to use	Don't use but plan to use	Use occasionally	Frequently use
Blogs	56%	15%	17%	7%
Wikis	20%	6%	38%	20%
Social Networking	46%	8%	13%	10%

The results highlight that while a somewhat considerable proportion of the students and faculty felt that selected Web 2.0 technologies would likely provide pedagogical benefits, only few chose to use them. This might be partially explained by their level of comfort with such technologies. Most of respondents have never used some of these Web 2.0 technologies. In fact, 80% of faculty and 71% of students have never used Blogs. On the other hand, faculty and students felt more comfortable using wikis, while 69% of faculty and 26% of students have never used them, 24% of faculty and 58% of students have some experience and comfort using wikis. Interestingly, 89% of faculty members have never used social networking tools. Conversely, 23% of students have some experience using social networks.

The lack of experience with most Web 2.0 technologies examined in this study could drive students and faculty members to avoid their adoption, although they realize that this adoption would provide many important benefits. In order to better understand factors leading to Web 2.0 technologies' adoption and use we applied the DTPB.

The second question examined which factors best predict the adoption of Web 2.0 applications by faculty and by students for instructional purposes. Examining the path analysis results, behavioral intention is a strong determinant of actual behavior or use of Web 2.0 for both students and faculty. Additionally, attitudes have very strong positive influences and perceived behavioral control has fairly strong positive influences on behavioral intention of both faculty and students to use Web 2.0 technology. Subjective norms, however, did not influence behavioral intention for faculty, but had a fairly strong positive influence for students. This discrepancy might be explained, in part, by the high degree of independence faculty have when developing their classroom environment (Barnett et al., 2004) and the reliance of students on peers and faculty to provide the majority of instructional support and tools to be used in a course. The results also show that ease of use, usefulness, and compatibility of Web 2.0 are key determinants of both student and faculty attitudes toward the use of Web 2.0 technology. Additionally, the influence of three groups: superiors, peers (other faculty), and students has positive influence on faculty member subjective norms; while both peer and superiors have positive influences on student subjective norms. In other words, these groups are key determinants of the social influence for the use of Web 2.0 technologies. Only self- efficacy was found to influence the perception of behavioral control for both students and faculty. On the other hand, facilitating technology and resource conditions does not have an influence on the perception of behavioral control toward the intention and use of Web 2.0 technologies. These results indicate that training and experience are important mechanisms in influencing Web 2.0 usage.

Implications

While the function of emerging technologies has vast potential to change the educational landscape and improve teaching and learning, most faculty today use technology for course content delivery, course administration, and basic communication (Maloney, 2007). While these are definitely valid uses of technology, it is also important

to use emerging technologies to create a learning environment that fosters collaboration among students and faculty; promotes the creation and sharing of new knowledge, and supports the development of new knowledge structures. The results of this study provide evidence that most students and faculty feel that the integration of Web 2.0 applications into the teaching and learning environment have the potential to increase student-student and student-instructor interaction, improve learning and writing ability, and increase student satisfaction with courses.

The results also indicate that student and faculty attitudes and their perceived behavioral control are strong predictors to their behavioral intention to use Web 2.0. Behavioral intention, in turn, is a strong indicator of actual behavior. Thus, the focus of administrators interested in increasing the use of Web 2.0 in the classroom might be on improving faculty attitudes toward emerging technologies as well as enhancing their perceived behavioral control of Web 2.0 use by providing appropriate training and support to use these tools.

While the use of these emerging technologies offers great potential in the higher education, further research is necessary to explore additional issues related to the implementation of Web 2.0 technologies, as well as to identify the most effective methods of integrating Web 2.0 applications in teaching and learning environments. This study serves as a starting point to further explore a variety of issues related to the integration of Web 2.0 applications in higher education.

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