Comparing the Use of Web-based Courseware in Volitional and Mandatory Settings

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Abstract: Web-based courseware such as Blackboard and WebCT has been used widely as support for a traditional classroom format. This study compares the use of web-based courseware in volitional and mandatory settings. A volitional setting is where students perceive the system use to be a willful choice, while a mandatory setting is where students perceive the system use to be compulsory. Built on the technology acceptance model (TAM), which has been expensively tested in examining the use of various information systems in organizations, this study examines any differences in the relationships among the constructs of TAM under the two settings. It uses data collected from volitional as well as mandatory users of the same web-based courseware with the same functions and content. The results of the study will provide valuable insights into how the relationships among the constructs of TAM are expected to vary for volitional versus mandatory users of web-based courseware, and contribute to the understanding of TAM in the context of webbased courseware.

Introduction

The technology acceptance model (TAM) posits that perceived usefulness (PU) and perceived ease of use (PEOU) are important factors that determine the user's attitude toward intention to use information systems (Davis, 1989). A key purpose of TAM is to provide a basis for tracing the impact of user perceptions of the system on use of the system. While many empirical studies have supported the predictive power of TAM in various settings of system use, they lack internal validity as they have been conducted under either volitional or mandatory setting of system use, not in a setting where the system has both volitional and mandatory users. A volitional setting is where users perceive the system use to be a willful choice, while a mandated setting is where users perceive the system use to be compulsory. Also, previous studies on TAM have measured actual system use through self-reporting or not measured actual system use. Since the ultimate objective of TAM is to predict actual system use, a study using more objective measures for actual system use is needed in order to add predictive power of the model.

This study intends to help resolve these limitations of previous studies on TAM and extend the line of empirical research on TAM into web-based courseware. Using data collected from volitional as well as mandatory users of the same courseware with the same functions and content, the study examines any differences in the relationships among the constructs of TAM under the two settings. It also uses two objective measures for actual use of the system: frequency and consistency of use. The results of the study will provide valuable insights into how the relationships among the constructs of TAM are expected to vary for volitional versus mandatory users of the system in the context of web-based courseware, and contribute to the understanding of TAM with enhanced internal validity and predictive power.

Conceptual Background

Researchers in information systems have made efforts in identifying the factors that facilitate system use and formulating the factors into a model in a way that can help in explaining and predicting system use. Since Davis (Davis, 1989) proposed such a model called technology acceptance model (TAM), many researchers have tested and extended TAM in various settings of system use. A key purpose of TAM is to provide a basis for tracing the impact of user perceptions of the system on actual use of the system. Figure 1 shows the formulation of TAM. TAM posits that perceived usefulness (PU) and perceived ease of use (PEOU) are important factors that determine the user's attitude towards his or her intention to use and actual use of the system. Also, the model posits that the user's behavioral control and subjective norm influence his or her intention to use and actual use of the system.



Figure 1. Technology Acceptance Model

While previous studies have generally supported the predictive power of TAM, a couple of limitations are recognized in those studies. First, most previous studies have been conducted in either volitional or mandatory setting of system use (Brown et al., 2002), not in a setting where the system has both volitional and mandatory users. A volitional setting is where users perceive the system use to be a willful choice, while a mandated setting is where users perceive the system use to be compulsory. Previous studies on TAM suggest that some relationships among the constructs in TAM may vary under the two settings, but they lack internal validity as they have been conducted under only one setting. A study on the effect of volitional versus mandatory use of the same system on the constructs of TAM is needed in order to control the setting of system use as a factor in the model and to strengthen internal validity. Second, most previous studies on TAM have measured actual system use through self-reporting or not measured actual system use (Legris et al., 2003). Since the ultimate objective of TAM is to predict actual system use, a study using more objective measures for actual system use is needed in order to add predictive power of the model.

The objective of the current study is to extend the line of empirical research on TAM in the context of webbased courseware. The study tests TAM in both volitional and mandatory use settings where the same web-based courseware with the same functions and content is used and examines any differences in the relationships among the constructs in TAM under the two settings. It also uses two objective measures for actual use of the system: frequency and consistency of use. These measures are objective in that they are not self-reported by users but measured by the system or calculated using data provided by the system (the next section explains these measures in more detail). Taken together, this study intends to contribute to the understanding of TAM in the context of webbased courseware.

Methods

This study uses a quantitative method in examining the relationships among the constructs specified in TAM. It uses data collected from a survey of two groups of students who used Blackboard for their course works and system use data generated by the system. The first group consists of students who used the system in a volitional setting. In this setting, students were not required to use the system for their course works. All class materials (e.g.,

syllabus, class notes, homework assignments and solutions, readings, and so on) were provided in hardcopies as well as made available on the system. Students could attend class and gain all of the content and instructions necessary for a high level of success in the course, although some of the materials were easier to obtain on the system. The second group consists of students who used the system in a mandatory setting. In this setting, all class materials were made available only on the system, and so, students had to use the system to do their course works and achieve a high level of success in the course.

Data for this study was collected from undergraduate students in four sections of an introductory information systems course offered in two semesters. Using the system was volitional in the two sections in one semester, while it was mandatory in the two sections in the other semester. The same instructor taught all four sections with the same class materials and used Blackboard as support for a traditional classroom format. The survey questionnaire contained multiple measurement items relating to each of the six constructs in TAM except the construct of actual use. It adopted scales that demonstrated good psychometric properties and internal consistency in previous studies. Each construct in the model was measured with multi-faceted items, and each item was measured by the extent of the respondent's agreement on the item.

In addition, two measures adopted from Baugher et al. (2003) were used for actual use of the system: frequency and consistency of use. The frequency of use is the total number of hits that students make to the course site on the system over the semester. This total was obtained from the system one day before the final exam. The measure for consistency of use was not directly provided by the system but it was computed by evaluating the number of hits accrued after one class but before the next class. When the student made no hit in the time between class meetings, he or she was assigned a '0' for that time period. When the student made at least one hit to the site during the time between class meetings, he or she was assigned a '1' for that time period. Since there were 30 time periods of this type over the semester (twice a week and fifteen weeks in a semester), this measure can range from 0 to 30.

The specific procedures of data analysis include confirmatory factor analysis for reliability and validity tests of each construct in the model and structural equation modeling and path analysis to estimate parameter values for the linkages between the constructs in the model. The study uses partial least squares as the tool for structural equation modeling. Structural equation modeling involves two phases. First, the measurement model is assessed. Second, once the measurement model has been shown to be adequate, the explanatory and predictive power of the model (i.e., the structural model) can be assessed.

Results

The main results of this study will be the identification of any differences in the relationships among the constructs specified in TAM under volitional and mandatory settings of web-based courseware use. That is, the results will provide valuable insights into how the relationships are expected to vary for volitional versus mandatory users of web-based courseware. On a practical level, such understanding will prove a helpful viewpoint for those who want to improve actual use of web-based courseware as support for a traditional classroom format. On a theoretical level, the results will help resolve some limitations recognized in previous studies on TAM with enhanced internal validity and predictive power. Taken together, this study will make a significant contribution to extending the line of empirical research on TAM.

References

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