Impact of Student Training on the Perceived Ease of Use and Ease of Navigation of a Learning Management System

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ABSTRACT

The impact of training for a new Learning Management System (LMS) was examined in this action research project. The study surveyed students (n=276) and determined that training did not affect the students’ perceived ease of use of the LMS. The time to complete the training was significantly lower (m = 35.54) than estimated (2 hours), and it was concluded that online training may not be an effective intervention to improve technology use and adoption for a younger demographic. An unanticipated result of the study was that students grossly over-reported completion of training, and create a sample size too small for generalization to any population. This over-reporting may be confirmation that survey fatigue is growing among the younger demographic. Over-reporting may be worthy of future study.

Categories and Subject Descriptors

H.5.2 [User Interface]: Training, help and documentation.

General Terms

Management, Measurement, Documentation, Performance, Design

Keywords


1. INTRODUCTION

Action research inquiries blend theoretical and practical questions and should provide insights to the scholar and the manager [1]. This paper reports on an action research project at a community college that was designed to answer the following three questions:

For the manager:

1. Will students who complete an online training program for a new LMS perceive the LMS as more usable?
2. What is the average time investment for a student?

For the scholar:

3. Is online training an effective intervention method for improving IT adoption and use based on the Technology Acceptance Model (TAM)?

When it was proposed to the faculty that all students be required to take the training on the new LMS, the teaching staff balked at the idea, the primary objection being the additional workload for students. With approximately 1,800 students and an estimated two hours to finish the training (this was an estimate from the LMS administrator), completing the training would require students to spend almost 3,600 hours of their time on a non-course activity. The faculty desired an investigation of the training’s impact before students were required to take the online training.

This study is important to the IT education community for two reasons: (1) LMSs are increasing across the education eco-system, and (2) it will validate training as an effective intervention to improve IT adoption and use. LMSs are increasingly common on campuses of K-12 schools, colleges, and universities. It has been reported that 3.9 million students have used a commercial LMS from Blackboard [2]. A 2008 study noted that little research had been done on intervention methods to improve technology use based on the TAM [3], and this study will examine the impact of a generic LMS training program, provided by the vendor, on the perception of ease of navigation and interactivity.

The rest of the paper will examine the literature on the TAM; present the instrument, methods, results, and discussions; and close with limitations and future research.

2. The Technology Acceptance Model (TAM) and Training Intervention

The TAM seeks to explain and predict technology-adoptions behavior through behavior intentions, perceived usefulness, and perceived ease of use [3]. Figure 1 shows the model in the rectangular group box. This study uses two antecedents to ease of use: interactivity and ease of navigation. Figure 1 shows these two factors in the shaded ellipses. The TAM has been expanded to include additional antecedents (perceived usefulness and perceived ease of use) in TAM-2 and TAM-3 [3]; however, the core factors of perceived usefulness and perceived ease of use have remained stable in the model. Ease of navigation and interactivity were presented as part of a website-usability model in a 2007 study [4] and are possible antecedents to ease of use. Research indicates that training and types of training can affect perceived ease of use [3]. This study seeks to determine whether online training will improve student perceptions of interactivity and ease of navigation. Research on the TAM and usability indicate that the TAM concept is predictive of use and perception of the technology or artifact [5].
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3. **Instrument**

The six questions used in this paper were validated in a 2007 study, and the ease of navigation and interactivity questions had adequate Cronbach’s alpha scores of 0.88 and 0.80, respectively [4]. Statistical scholars have argued that Cronbach’s alpha scores above 0.7 are adequate [6]. The six questions in this dataset had a Cronbach’s alpha score of 0.93.

The instrument had three questions related to navigation: “On this website, it is simple to accomplish the task I want to accomplish” (N1), “I find this website easy to use” (N2), and “It is easy to find the information I need” (N3). All of the questions used a seven-point scales anchored by strongly agree and strongly disagree. The instrument had three questions related to interactivity: “The website offers customization” (I1), “The website can treat you as a unique person and respond to your specific needs” (I2), and “The website provides content tailored to the individual” (I3).

4. **Methods**

A web-survey tool was used to collect the data, and SPSS was used to examine the questions on the impact of training and the validity of training as a TAM intervention method (Questions 1 and 3). The question of time investment was answered using the LMS log file for the training class, and SPSS was used to generate a trimmed mean (Question 2).

This study used two different groups of students. The control group (n=257) did not take the training, and the test group (n= 19) did take the training. The students who took the training received course credit. Statistical scholars recommend using a Mann-Whitney U Test to examine the difference between the means of independent groups when the data are not interval [7-8]. The hypotheses tested will answer Questions 1 and 3 and are as follows:

- **H1**: Students who took the training will view the LMS system as “simpler” (N1).
- **H2**: Students who took the training will view the LMS system as “easier to use” (N2).
- **H3**: Students who took the training will view the LMS system as “easier to find” (N3).
- **H4**: Students who took the training will view the LMS system as “customizable” (I1).
- **H5**: Students who took the training will view the LMS system as “unique” (I2).
- **H6**: Students who took the training will view the LMS system as “tailored” (I3).

Question 2 used the built-in logging tool in the LMS system to track the number of minutes that each student spent in the training course. SPSS was then used to calculate a trimmed mean time.

5. **Results**

The data failed tests of normality with each component having a significant Kolmogorov-Smirnov test score below .05 (see Table 1). This, along with the non-interval nature of the data, required the use of non-parametric tests to test the hypothesis [6, 7, 8].

<table>
<thead>
<tr>
<th>variable</th>
<th>Statistic</th>
<th>Df</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>.233</td>
<td>281</td>
<td>.000</td>
</tr>
<tr>
<td>N2</td>
<td>.225</td>
<td>283</td>
<td>.000</td>
</tr>
<tr>
<td>N3</td>
<td>.252</td>
<td>283</td>
<td>.000</td>
</tr>
<tr>
<td>I1</td>
<td>.140</td>
<td>272</td>
<td>.000</td>
</tr>
<tr>
<td>I2</td>
<td>.138</td>
<td>274</td>
<td>.000</td>
</tr>
<tr>
<td>I3</td>
<td>.158</td>
<td>274</td>
<td>.000</td>
</tr>
</tbody>
</table>

All six of the hypotheses were rejected using a non-parametric statistical significance test (see Table 2). Based on the data, SPSS selected the Mann-Whitney U Test for the hypothesis. This test, the non-parametric equal of the t-test, compares the medians, and it is recommended by statistical scholars [6].

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1 Ninety-six students self-reported that they had completed the training, so the survey was closed. However, an analysis of the log files on the training later showed that only 19 had completed the training.
Table 2 Hypotheses Tested

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Sig</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: Students who took the training will view the LMS system as “simpler” (N1).</td>
<td>.679</td>
<td>Rejected</td>
</tr>
<tr>
<td>H2: Student who took the training will view the LMS system as “easier to use” (N2).</td>
<td>.987</td>
<td>Rejected</td>
</tr>
<tr>
<td>H3: Students who took the training will view the LMS system as “easier to find” (N3).</td>
<td>.297</td>
<td>Rejected</td>
</tr>
<tr>
<td>H4: Students who took the training will view the LMS system as “customizable” (I1).</td>
<td>.180</td>
<td>Rejected</td>
</tr>
<tr>
<td>H5: Students who took the training will view the LMS system as “unique” (I2).</td>
<td>.202</td>
<td>Rejected</td>
</tr>
<tr>
<td>H6: Students who took the training will view the LMS system as “tailored” (I3).</td>
<td>.054</td>
<td>Rejected</td>
</tr>
</tbody>
</table>

The lack of significant scores indicates that there was no difference between the trained group and the un-trained group on the six questions. To determine the average time to complete the training, the log system in the LMS was used to record and post minutes. During the analysis of the log, it was found that only 19 of the 96 students who self-reported that they had completed the training actually logged any time in the training course. The survey was closed, because the quick-report tool showed that 96 students had completed the training. If the actual number had been known to the researcher, the survey would have remained open for a longer time. However, for the analysis, only those who logged time in the system were placed into the test group.

The average time to complete the training was 41.5 minutes with a standard deviation of 34.54 (n=19). This average was deemed uncharacteristically high because of the extremes seen in the times it took to complete the training based on the box-plot seen in Figure 2. An average was recomputed after trimming the upper and lower scores. This trimmed mean was 35.83 with a standard deviation of 21.69.

6. Discussion

The study found no evidence to support requiring students to take the LMS training, and the time required to complete the course was less than originally estimated. No answer could be offered on the value of training as an intervention.

Question 1: Will students who complete an online training program for a new LMS perceive the LMS as more usable? No. Training will not be recommended for all students on the LMS.

The data gathered and analyzed in this study indicates that the training had no impact on the perceived usability of the LMS. Thus, there is no motivation for the college to require students to take the training. Given the traditional age demographic (18-25), this is not surprising.

The lack of impact of the training on perceived usability supports the argument that current students are digital natives; they have grown up with the technology and perceive it as commonplace and easy to use [9]. The college’s assumption that students would need training was driven by the request for training from the faculty who fit the description of digital emigrants, people who are uncomfortable with technology and struggle to use it.

Question 2: What is the average time investment for a student? The average time investment is under one hour. The training will not be recommended.

Question 3: Is online training an effective intervention method for improving IT adoption and use based on the TAM? The evidence is inconclusive. The survey did not collect age information, and the relationship between the variables was not controlled for age. Older students have been shown to view training as more vital; however, the age of the college students placed them in a demographic group that views training as less valuable [3].

7. Limitations and Future Research

The primary limitation of this study is the number of students in the test group and restricts the ability of this study to generalize to any population. Although 96 students reported taking the training, only 19 logged any time on the training system. If this study were to be repeated, a key correction would be to proctor students taking the training. To avoid the survey taking away from class time, this was not done. The faculty working on this study expressed that they could not commit any class time to taking the survey.

Figure 2
Future research that could be built upon this study could examine the question of survey fatigue and accuracy of self-reports of the younger or digital native demographic.

Research scholars have reported increasing survey fatigue, abandonment rates, and incomplete responses [10]. The mis-reporting of the training completion in this study could be a representation of this phenomenon among the college student demographic. More care could have been taken in proctoring the training, but the issue of mis-reporting is still worth examining. If digital natives generally mis-report survey research, using this demographic as a sample could skew and weaken the results.

Finally, the American Society for Training and Development reported that, on average, organizations spend $1,068 on learning and development for employees [11]. Digital natives may not view training as vital as older generations. Thus, organizations should carefully consider the need for training on computer systems for digital natives.

8. Reference and Citations