Wiki or Word? Evaluating Tools for Collaborative Editing and Teamwork

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ABSTRACT

Many college courses involve group work where teams of students are asked to create a report as the final result of a collaborative effort. The creation of such a shared document often causes students great trouble in coordinating the effort. In this paper we describe two approaches to supporting students in collaboratively creating and editing a report for an introductory course in information systems. One group of students used MS Word with Track Changes turned on combined with emailing the document between students. A second group was provided a Twiki site where they were able to create the report. Preliminary analysis shows that students found the Word and email combination more useful and easier to use than the wiki environment in completing the project.

INTRODUCTION

Wikis are web sites that allow many people to edit the site very easily. This has produced such stunning successes as Wikipedia and WikiWikiWeb, as well as wikis on every conceivable topic. Creating a new wiki is very simple, as several web sites offer basic wikis for free (including WikiSpaces, Wetpaint, and Wikia).

The education community has also grabbed onto the idea of a wiki as a way to increase student engagement and collaboration within the classroom (Parker and Chao, 2007). Educators have found many different ways to incorporate the use of wikis in classes. Some of the common uses include creating a shared annotated bibliography of class readings; developing shared lecture notes; publishing syllabi, assignments, and handouts; as well as student collaborations on a shared document such as research papers, reports, etc.

TASK TECHNOLOGY FIT

Wikis are thought to be an important tool to support collaboration. One aspect of collaboration that wikis might support is the development of a paper by multiple authors to address some subject or problem. However, there is little empirical evidence to suggest that this new technology offers a significant advantage to the common practice of sending word processing documents between authors where each edits the document and then sends it on. Information systems research has developed two models to

assess the impact of a technology on the performance of a task and the utilization of the technology to perform the task. The first model is the Technology Acceptance Model (TAM) which is used to determine a potential user's attitude toward using the technology based on the technology's perceived usefulness and ease of use (Davis, 1985). The second model is Task Technology Fit (TTF) which is used to assess the perceived fit between a user's task needs and the functionality provided by the technology (Goodhue, 1995; Goodhue and Thompson, 1995). Dishaw and Strong (Dishaw and Strong, 1999) combine these two models to develop a model with more explanatory power than either alone (Figure 1).
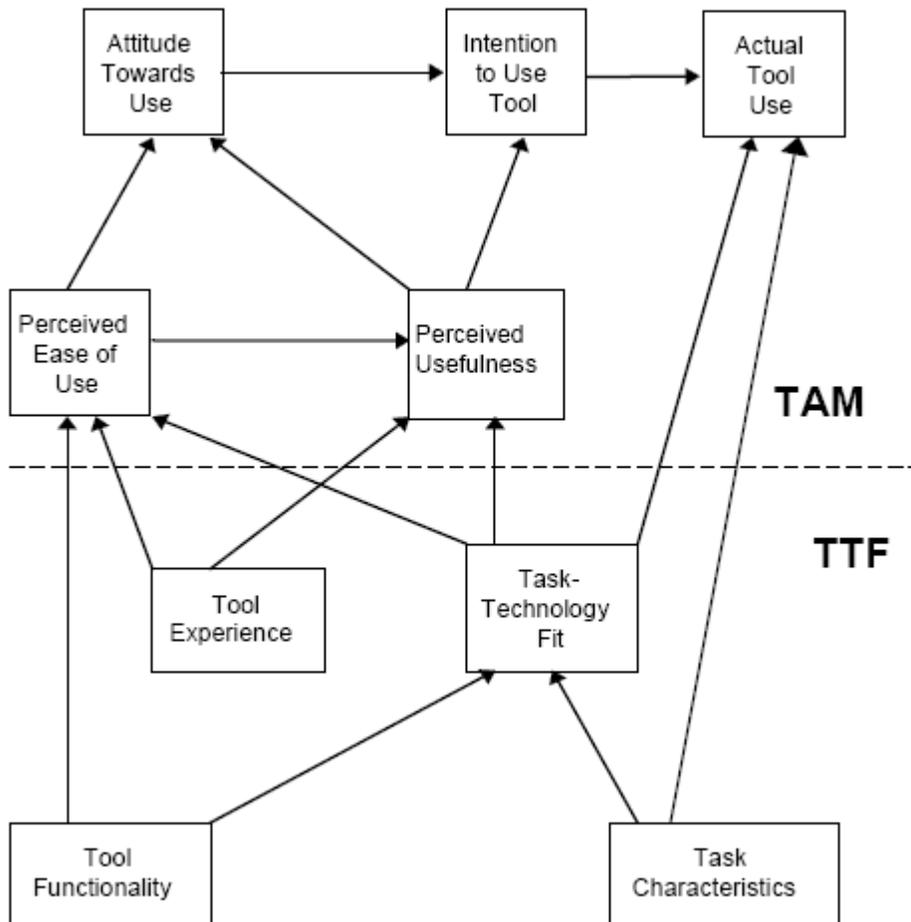

Figure 1. Integrated TAM/TTF Model

In this research we examine if there is a difference between two technologies with regard to the task of shared document development. The following hypotheses are based on the above model. The first hypothesis examines if there is a difference between wikis and word processing document exchange with regard to the factors in the integrated TAM/TTF model. If there is no difference, there is no reason to believe either technology is better than the other.

> *H1: There is no difference between the two technologies.*

If there is a difference we need to examine what that difference is. The following three hypotheses examine this question. The first area to investigate is whether or not there was a difference in the perceived usefulness of the technology. Presumably, a technology that is perceived to be more useful will lead to more use and better outcomes.

H2: There is no difference between the two technologies in terms of perceived usefulness.

The third hypothesis examines how easy users thought it was to use the technologies. Again, a technology that is easier to use will likely be used more often with better results.

H3: There is no difference between the two technologies in terms of perceived ease of use.

The final hypothesis focuses on the specific question of collaboration. Collaboration support is thought to be the primary advantage of a wiki over word processing software to create and edit documents by a group.

H4: There is no difference between the two technologies in terms of the perceived effort associated with collaboration.

METHOD

This research project is based on the course "Essentials of IS" at University of Wisconsin Oshkosh in Fall 2007 in eight sections with 20-30 students in each, taught by three different faculty members. The course is a required course for all business majors at the College of Business.

Two of the instructors showed students how to use the Track Changes feature of MS Word to determine who had worked on the document, and what changes they had made. They were instructed to use MS Word and email as the primary tools to collaborate and exchange the document. The third instructor used a wiki site to facilitate collaboration among the students. The wiki was open to only the participants of the course. The particular wiki tool chosen for this course was Twiki (www.twiki.org), which is billed as an *enterprise wiki*.

A major assignment of the course was a group research paper where students in groups of three were asked to find and describe an emerging and/or disruptive information technology that would havea significant impact on a fictitious small manufacturing firm (making pallets) by providing it with a competitive advantage. Students were asked to apply Porter's Five Forces Model, and also were recommended to use additional models like the value chain model to determine the technology's effects on the firm. Group memberships were assigned randomly within each section. This was done to force students to use technology to collaborate, and to illustrate the real way that projects are conducted in companies where participants may not know or see each other, and often live in different time zones making real-time communication difficult.

Since wikis are less familiar to students than MS Word, the instructor who used wiki incorporated the tool throughout the course to increase student's familiarity with the tool. Students worked in the small groups throughout the semester, but were also required to work individually on certain assignments, and certain exercises had up to 30 students collaborating on creating a single page. Some of these assignments carried minimal weight in the grading, but were designed to allow students to familiarize themselves with the Twiki environment, collaboration in general, as well as to engage with the course material, prior to doing the research paper.

Survey
Based on the instrument developed by Dishaw and Strong (1999), we developed an online survey to ask detailed questions of the participants' experience with the collaboration on the project. The Dishaw/Strong instrument has demonstrated validity in measuring many of the factors associated with the integrated TAM/TTF model. The instrument language was modified to fit the technology used in this

study. Students were given extra credit on the course grade for completing the survey, giving a very healthy response rate of 80.5%.

Table 1. Overview of responses and technologies.

Instructor	No. of Sections	Technology	Enrolled	Responses	Response Rate
Iversen	4	Wiki	88	74	84.1%
Philip	3	Word+Email	79	56	70.9%
Eierman	1	Word+Email	28	27	96.4%
Total			**195**	**157**	**80.5%**

RESULTS

The following results are preliminary at this time. More explanation will be included in the presentation and final submission.

The first hypothesis is rejected. Ten of the 13 factors measured by the instrument showed a significant difference between the Wiki environment and the word processing environment. There is a perceived difference between the two technologies with regard to the task.

The second hypothesis is rejected with a significance value of $p=.000$. Users of Word perceived that the technology was more useful than users of the wiki perceived the wiki technology to be.
The third hypothesis is rejected with a significance value of $p=.000$. Users of Word perceived that the technology was easier to use than users of the wiki perceived the wiki technology to be.
The fourth hypothesis is also rejected with a significance value of $p=.000$. Users of Word perceived that they collaborated more than users of the wiki perceived they collaborated.

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