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## USING WIKIS TO SUPPORT VIRTUAL TEAMS IN EDUCATION: THE EFFECT OF INSTRUCTOR LEADERSHIP STYLE

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### Abstract:

This extended abstract describes the design of a study that was recently conducted to learn more about how to use one specific type of collaboration technology – wiki technology – to support virtual teams of students in an educational setting. The specific research question that was investigated was: For a wiki exercise, what is the impact of instructor online leadership style on student participation, performance and perceptions? Results from a study involving 58 virtual teams of students are discussed.

**Keywords:** Leadership, virtual team, wiki

## I. INTRODUCTION

A virtual team is defined as a team in which one or more team members are separated by distance or time. The use of virtual teams to conduct group work is becoming more common in organizations [Malhotra, Majchrzak, and Rosen, 2007]. For example, virtual teams are frequently used in the area of software development [Louridas, 2006; Rech and Bogner, 2007]. To enable communication among team members who cannot meet face-to-face, virtual teams are often supported by collaboration technologies such as e-mail, electronic conferencing, and wikis. In an effort to help prepare students for the group environments and technologies that they may encounter in the workplace, a number of Information Systems educators are introducing students to virtual team experiences in the education environment [Alexander, 2006; Chen, Sager, and Corbett, 2008; Goold, Auger, and Farmer, 2006]. This extended abstract describes the design of a study that was recently conducted to learn more about how to use one specific type of collaboration technology – wiki technology – to support virtual teams of students in an educational setting. The specific research question that was investigated was: For a wiki exercise, what is the impact of instructor online leadership style on student participation, performance and perceptions?

## II. BACKGROUND AND LITERATURE REVIEW

A “wiki” is software that allows people to work together to create, edit, and organize web page content using a web browser. There have been a number of reports regarding the suitability of wikis to support learning groups in an educational setting [Kane and Fichman, 2009; Mindel and Verma, 2006; Xu, 2007]. In addition, wikis are now being used by many organizations to support communication, collaboration, and project management. According to a poll published in Information Week [Dornan, 2007], wiki technology is considered by over a quarter of business professionals surveyed to be a “critical” or “very important” tool for their organization.

Despite the growing role of wikis in education and organizations, there is not much research concerning the best ways to use wikis to support virtual teams. Thus, it is important for educators to learn more about how to use wikis to support learners. One way in which educators may be able to influence the use of wikis by their students may be through online facilitation provided by

text-based comments. Drawing on work by Bass [1985] concerning leadership styles, it may be possible for an instructor to influence the performance and perceptions of students using wikis by using the text-based media of a wiki to adopt a “transactional” or “transformational” leadership approach. (In the context of an instructor-student relationship, a “transactional” style of leadership would encourage compliance through rewards or threats of punishment. In contrast, a “transformational” style would attempt to inspire and motivate students through means such as charisma and intellectual motivation.) Research studies conducted with text-based types of collaboration technologies have examined the role of leadership approaches on the performance and perceptions of virtual teams [e.g., Hambley, O’Neill, and Kline, 2007; Kahai and Avolio, 2006; Kahai, Sosik, and Avolio, 2003]. While the results of past studies have been mixed, some of the findings have indicated that leadership style can influence virtual teams – even in cases where the leadership style was communicated using a text-based method.

For educational situations in which students were working in virtual teams using wiki technology, it would be useful for an instructor to know how to promote team performance and the learning experience. It is possible that one way to do this may be through the active leadership and facilitation of the virtual teams. To learn more about how an instructor may be able to influence the performance and perceptions of a virtual team working with a wiki, an empirical study was conducted. The following section describes the methodology employed for the study.

### **III. METHODOLOGY**

The study has recently been conducted and the research data has been collected. Provided below is a summary of the methodology used for the study.

#### **Participants**

The study participants were third-year undergraduate business students at a large university in the western United States. The students were from three sections of a course entitled “Business Process Management.” All students were taking the course during the same quarter and were taught by the same Information Systems faculty member. Students from the three different sections of the course were randomly grouped into 58 virtual teams of 3 students, with each team being comprised of one member from each class section.

#### **Preparation**

Prior to doing the research task, all students taking the course were introduced to the topics of virtual teams, process analysis and sustainability through readings and lectures. Following the coverage of the topic of virtual teams, the participants were assigned to the three-person virtual teams and each team will be provided with a private wiki. To ensure that each student had an opportunity to develop a “hands on” ability to use the wiki prior to the study task, each student was assigned a structured tutorial exercise that involved using their team’s wiki.

#### **Pre-survey**

Following completion of the wiki tutorial, a pre-survey was administered to the participants to gather basic demographic data (e.g., gender, expected major, class level), assess familiarity with the wiki technology, and assess the structured tutorial exercise.

#### **Research task**

The research task was a team exercise that required the team members to analyze a case describing the “environmental footprint” of a fictitious university student. All participants got the same task. The exercise was divided into two portions. The first portion of the exercise subdivided the case analysis into three portions and asked each team member to analyze one portion of the case. As part of this analysis, each student generated ideas regarding ways to reduce the “environmental footprint” for the fictitious student. The second portion of the exercise

asked the team to build on the individual findings of the team members and develop a collaborative document that describes the team's overall analysis and recommendations. As members of a virtual team, the participants were required to use the team's wiki for the first and second portions of the exercise. The exercise was completed outside of class as a regular assignment. The teams had a total of two weeks to work on the research task.

### **Experimental design**

A semi-controlled experiment was conducted to explore the research question. The research design was a 1 X 3 design using the virtual team as the primary unit of analysis. The independent variable was the instructor's online leadership style. Drawing from the research on leadership and virtual teams, three types of online leadership styles were used: no facilitation, transactional style, and transformational style. Online leadership was provided using a text-based approach described by several authors [e.g., Hambley, O'Neill, and Kline, 2007; Kahai and Avolio, 2006]. A third of the virtual teams had no online facilitation from the instructor – this was considered the control group. The remaining virtual teams each received one short textual message each day from the instructor posted to their wiki and e-mail. A third of the virtual teams got daily online facilitation messages that incorporated the "transactional" style of facilitation. The transactional messages were drawn from messages used in other studies involving electronic media [e.g., Hambley, O'Neill, and Kline, 2007] and highlighted the goals to be accomplished and the rewards for doing the task well. An example of a transactional message was "The team is well on the way to creating an excellent set of recommendations. Keep working toward the goal of doing an outstanding job." Another third of the team got online messages that represent a "transformational" style of facilitation. The transformational messages use for this research were also drawn from related studies and emphasized the importance of working together, highlighted the value of team synergy, and emphasized the opportunity to learn from others. An example of a transformational message was "Your team has generated a lot of good ideas so far by working together. Keep up the good work."

### **Final survey**

Following completion of the research task, a second survey was administered to assess perceptions regarding the exercise, the wiki, the team, and the online facilitation approach.

### **Outcome measures**

The outcome measures were participation (measured by the frequency and timing of information saved to the wiki), team performance (measured by the number of correct recommendations generated and quality of group document), and perceptions (satisfaction, team cohesion, assessment of learning and the exercise).

## **IV. FINDINGS**

A summary of the findings from the study will be presented and discussed at the conference.

## **ACKNOWLEDGEMENTS**

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