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## **SUPPORTING STUDENT COLLABORATION FOR ONLINE LEARNING: THE IMPACT OF TWO INSTRUCTIONAL INTERVENTIONS**

Craig K. Tyran

*College of Business and Economics Western Washington University*, [tyranc@wwu.edu](mailto:tyranc@wwu.edu)

V T. Raja

*College of Business Oregon State University*, [VT.Raja@bus.oregonstate.edu](mailto:VT.Raja@bus.oregonstate.edu)

Kristi L. Tyran

*College of Business and Economics Western Washington University*, [tyrank@wwu.edu](mailto:tyrank@wwu.edu)

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## SUPPORTING STUDENT COLLABORATION FOR ONLINE LEARNING: THE IMPACT OF TWO INSTRUCTIONAL INTERVENTIONS

Craig K. Tyran  
College of Business and Economics  
Western Washington University  
tyranc@wwu.edu

V.T. Raja  
College of Business  
Oregon State University  
VT.Raja@bus.oregonstate.edu

Kristi L. Tyran  
College of Business and Economics  
Western Washington University  
tyrank@wwu.edu

### Abstract

This extended abstract provides an overview of an exploratory study that is being conducted to investigate two potential ways in which an instructor may be able to support online student teams assigned to analyze a case and create a collaborative digital document. Specifically, the study was designed to examine the impact of instructor leadership style and process structure on student perceptions and performance. Data has been collected for 60 3-person teams of students enrolled in an upper-division undergraduate information systems course entitled “Business Process Management.” The research data has been collected and will be analyzed. Preliminary findings from the study will be discussed.

**Keywords:** Distance education, Instructor facilitation, Leadership style, Online learning, Process structure, Virtual team, Wiki

### I. INTRODUCTION

The proportion of university students taking one or more online courses has been increasing steadily over the past decade. In 2017, almost one third of university students attending nonprofit institutions in the United States had been enrolled in one or more online courses during the year [Lederman, 2018]. The recent – and ongoing – pandemic situation has resulted in even more attention to online learning, as most university instructors have needed to deliver their courses using an online platform during the pandemic [June, 2020]). As instructors have become more familiar with online teaching technology and consider incorporating online teaching methods into their future courses (e.g., hybrid courses, online courses), it is important to investigate how the technology may be used most effectively.

A common type of learning activity for university courses is the team project. The availability of collaboration technology has made it possible to incorporate a team project into an online course. The potential benefits of a team project include idea and information sharing, deeper learning and retention, and experience with virtual teams [Alden, 2011; James et al., 2020]. A common task associated with an online team project is the development of a collaborative team document (e.g.,

report). For online courses, there are several types of technologies that are readily available which can support a team working on a collaborative document (e.g., wikis, Google docs).

For this study we have drawn on the virtual team and education literature to design a study to explore the impact of instructor leadership style and process structure on the perceptions and performance of student teams that are developing a collaborative document. The next two sections of this document provide a brief literature review and a summary of the study methodology. The data for this study has been collected and will be analyzed. Preliminary findings will be presented at the AIS SIG-ED 2021 Conference.

## II. LITERATURE REVIEW

Research concerning collaborative technology in education suggests that the way that an instructor communicates with student teams can have an impact on team behaviors. For example, a study by Lee and Recker [2021] found that the way that an instructor designed and facilitated online discussions influenced students' participation and performance. Also, studies by Mazzolini and Maddison [2003, 2007] found that the way that an instructor interacted with students sharing ideas on an online discussion forum can influence student participation and perceptions. One of the ways in which an instructor may be able to support students' application of collaborative technology (e.g., wiki, shared digital document) may be through the instructor's leadership style. Research on teams conducted by Bass [1985] has found that leadership style may influence the perceptions and performance of teams. If the findings from this research can be applied to virtual teams of students in the remote learning environment, it may be possible for an instructor to influence the performance and perceptions of students by incorporating a "transactional" or "transformational" type of leadership approach. For a learning environment, a "transactional" leadership style would seek to encourage students to do well by highlighting outcomes such as earning a good grade for high quality work. Alternatively, a "transformational" style would seek to inspire and motivate students in a different way, such as emphasizing the value of learning or working together. A variety of research studies using text-based collaboration technologies have explored the role of leadership approaches on the perceptions and performance of virtual teams [Hambley, O'Neill, and Kline, 2007; Kahai and Avolio, 2006; Kahai, Sosik, and Avolio, 2003]. Although the results of these studies have been mixed, some studies have found that leadership style can have a favorable impact on virtual teams.

Another way in which an instructor might be able to support virtual teams of students working on a group project is by decomposing the project task into sub-parts. For example, research involving groups performing a brainstorming task with collaborative technology found that providing "process structure" by decomposing the task into sub-parts enhanced team performance [Dennis et al., 1996]. A study which examined the impact of process structure in the educational environment was conducted by Van Rooij [2009] and focused on students working on a team class project. This study was conducted in a face-to-face setting and found that providing templates which decomposed project deliverables into "work packages" facilitated team communication and positive collaborative behavior. Findings from these two studies, as well as others, indicate that the use of a simple form of process structure (e.g., a template or outline) which decomposes a task into clearly identified sub-portions may be a way to help enhance the learning experience for online student teams.

Based on the literature, instructor leadership style and process structure may have the potential to enhance student perceptions and performance for an online collaborative team task. The next section discusses the methodology for a study that was undertaken to explore the impact of these two types of interventions.

## III. METHODOLOGY

### Participants

The participants in the study were upper-division undergraduate business students at a large university in the United States. The students were enrolled in three sections of an information

systems course entitled “Business Process Management.” Each section of the course was taught by the same instructor and during the same academic quarter. The students from the three different course sections were randomly grouped into 60 virtual 3-person teams, with each team being comprised of one member from each class section.

### **Research task and technology**

The research task was a collaborative exercise in which each team was required to analyze a case and create a collaborative digital document. The case described the “environmental footprint” of a fictional college student. The exercise consisted of two parts and was conducted over the period of two weeks. The first part of the exercise decomposed the case into three sub-parts and required each team member to generate ideas for ways to reduce the “environmental footprint” for the fictional student. The second part of the exercise asked the team to draw on the findings from each team member to develop a collaborative digital document that described the team’s overall analysis and recommendations. The first part of the task was due at the end of the first week and the second part of the task was due at the end of the second week.

The collaborative technology that the team members used for each part of the research task was a wiki [Kane and Fichman, 2009; Mindel and Verma, 2006]. The wiki provided an easy-to-use web-based interface that allowed team members to type, edit, and share their work with the team. The participants were required to use the team’s wiki for all portions of the team exercise. Prior to undertaking the research task, all students were required to complete a structured tutorial exercise that involved using their team’s wiki. After completing the wiki tutorial, all participants took a pre-survey to gather basic demographic data (e.g., gender, class level) and assess familiarity with the wiki technology.

### **Experimental design**

A semi-controlled experiment was conducted to explore the research question. The research design was a 2 X 3 design. The independent variables were process structure and the instructor’s leadership style. The process structure took one of two forms: no process structure (i.e., a blank wiki window) or process structure provided by a wiki window which incorporated an outline that included each sub-part for the final team deliverable. Half of the teams had wikis with no process structure, while the other half of the teams did have process structure.

The instructor’s leadership style took one of three forms: no facilitation, transactional leadership style, and transformational leadership 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 received no online facilitation from the instructor. The remaining virtual teams each received a total of five short textual messages posted to their wiki and e-mail over the course of the two-week team assignment. A third of the virtual teams were sent 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.” The remaining third of the teams received online messages that represented a “transformational” style of facilitation. The transformational messages used for this research were also drawn from published 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 that will be evaluated are a) individual and team performance measured by the quantity and quality of ideas generated, and b) perceptions regarding satisfaction, team cohesion, assessment of learning and the exercise.

## IV. FINDINGS

The findings from the study will be presented at the AIS SIG-ED 2021 Conference.

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