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ABSTRACT

This study examined how adult graduate students made use of technology to mediate group interactions and processes in an online learning environment, also noting why individual groups of students chose particular tools and methods. The online course was delivered using a third-party course management tool. The structure of the course and the use of computer-mediated communication tools to promote interaction were somewhat controlled by the course management tool's pedagogical assumptions of design and the resulting technological and structural capabilities. Data were collected via conversations with a student, surveys that examined students' beliefs about their group processes, and a focus group interview. Results indicated that time was a major factor in determining how one group structured their use of the available technology tools. The course tool limited some of the design decisions about interaction. However, based on the interactions within the three groups, the personalities and experiences of individual members also played a role in their interaction. The need and ability to trust was a common theme among respondents. For at least two of the groups, students' level of technological experience factored in at the beginning of the group project. (Contains 19 references.) (SM)

Running head: FACTORS THAT AFFECT ONLINE TEAMS

What factors affect the way teams interact in an on-line graduate course?

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Abstract

The purpose of this paper is to examine how graduate students made use of technology to mediate group interactions and processes in an online learning environment, and why individual groups chose particular tools and methods. Both the results from a focus group and the students' self-reports on their processes will be presented.

Adults in Higher Education

The changes that the information age has brought to organizations (Reigleuth, 1999), along with globalization and technology (Kasworm, 2003), have necessitated that employees continuously improve their skills. Therefore, institutes of higher education are experiencing a large in-flux of what were once known as 'non- traditional students', that is adults who attend or return to college later in life rather than directly out of high school or undergraduate programs.

In fact, Kasworm (2003) reports that in 2010 it is estimated that 38.2 percent of the collegiate population will be twenty-five years or older. Kasworm (2003) defines an adult as someone with the

> status of age (typically defined as twenty-five years of age or older); the status of maturity and developmental complexity acquired through life responsibilities, perspectives, and financial independence; and the status of responsible and often competing sets of adult roles reflecting work, family, community, and college student commitments. (p. 3)

Because of their multiple commitments, adult learners need a flexible method for gaining the information, skills, and degrees that are required to stay viable in today's workforce. It is no wonder that distance education, in particular online learning, has become so popular in the last 10 years.

Using the Internet as a classroom has revolutionized higher education, especially in distance learning (Abrahamson, 1998). In recent years, technology has significantly diminished the importance of physical proximity between individuals not only in the business sector, but also in higher education. In fact, in 2000 course enrollments for courses delivered over the web in the United States, at more than 100 accredited institutions (Miller and Miller, 1999), were in the six figures (Uribe, Klein, & Sullivan, 2003).

The meaning of the term "distance learning" has become more than the sum of it's parts. The definition lies within the learner's experience, in how the technology mediates the interactions between learners as well as those between the content and the instructor. In fact, Moore (1989) noted that three types of interaction take place in online learning to advance past basic correspondence (a) learner-learner, (b) learner-instructor, and (c) learner-content. Masie (as cited in Sloman, 2002) offers this thought about computer-based education " E-learning is not about computers and not about computing. It should be about communications with the learner, seeking to increase knowledge and encourage meaningful interchanges and transactions that achieve this objective" (p. 35).

The purpose of this paper is to examine how graduate students made use of technology to mediate group interactions and processes in an online learning environment, and why individual groups chose particular tools and methods.

Design Decisions

As educators, each of us has a philosophy of learning, whether explicitly stated or not, that guides our instructional design decisions. My teaching strategies are based on several theories of learning and instruction, e.g. Kolb's (1984) experiential learning theory, Gagné's conditions of learning and subsequent nine events of instruction (Gagné, Briggs, & Wager, 1992), and situated cognition (Brown, Collins, & Duguid, 1989). As an instructional designer, however, the instructional strategies for both my traditional, i.e. face-to-face, and online courses are always based on the learning outcomes that I have determined are key for the course and on my learners' needs.

To meet the needs of the adult learners at our Southeastern University, our program offers an Instructional Design Master's degree completely online, in addition to traditional

courses offered in the evenings. The course discussed in this paper was a graduate Needs Assessment course offered fully online. In this particular course there were 10 adults enrolled in either the Masters or PhD instructional design program.

The learners in this course were adults who had many of the same characteristics described by Kasworm (2003). For example, these learners had both employment and personal commitments not experienced by younger learners. While similar in their non-traditional stature, these learners were quite diverse in that they were at varied stages in their program of study and also had varying levels of technological skills.

Because of the increased frequency with which people work in groups in business and industry, as well as the positive learning gains that can be realized from collaboration in the classroom, many educators have turned to instructional approaches that champion cooperative learning (Reigeluth, 1999). In fact, some researchers feel that online collaboration transforms individual learners into a community of learners that can be connected by common interests (Blocher, Montes, & Willis, 2002).

Recognizing the importance of collaboration in the virtual classroom, many web-based delivery systems have included various tools that can be used to support collaborative learning, including email, chat rooms, and threaded discussion boards. In addition to designing for my learners' needs, I had to take into account the fact that this course was delivered online using a third-party course management tool. The structure of the course and the use of computer mediated communication (CMC) tools for promoting interaction were somewhat controlled by the course management tool's pedagogical assumptions of design and the resulting technological and structural capabilities.

In this course, each group had access to their own chat area, threaded discussion, document sharing, and email. In addition, the Chat room was archived so that both the students and the professor had access to past discussions.

One of the assignments for this course was a group Needs Assessment project. I divided the class into three groups based first on each student's project choice and additional information provided in their responses on the first threaded discussion. The additional information used to assign students to groups was 1) the students' current amount of time in the program, 2) other instructional design experience, 3) choices of partners, 4) cultural background, 5) technological experience (with online classes), and 6) distance from campus (see Table 1).

Table 1: Information on group members.

Student Choice	Student Information: Selection factors
Project 2	Masters/ 1st semester; unemployed; recently moved out of town
Project 2	Masters/half-way; retired armed forces/ physical scientist, located out of state
Project 2	Masters/ 3rd Semester; armed forces; knows one other student in group, local
Project 2	Masters/1st semester; armed forces; knows one other student in group; Alaska
Project 1	Masters/teaches science/ somewhat local
Project 1	PhD; Nursing/ teaches/ children/ local
Project 1	PhD; teaches middle school/ coaches/ local
Project 2	Masters/last semester; works in ID field- Retail; knows several students; local
Project 2	Masters/works in mental heal field/ Local/
Project 2	Masters/half-way; emergency medical field; teaches at night; knows one other person in group; local

Formative Evaluation and Research Question

As a means of gathering formative evaluation data on the effectiveness of several of the instructional strategies I implemented during the semester, I administered a supplemental end of course survey that specifically addressed those instructional strategies. After reviewing the responses to the survey questions I conducted an informal follow up conversation with one of the

students related to their group processes. From the survey results and the conversation with this student, I decided to investigate how all three groups used the technological tools in their group projects, and reasons for their technology choices.

The next step was to conduct a focus group interview that included one member from two of the groups and two members from the third group, for a total of four participants. From the participants' responses I began to question how my instructional design choices affected the group processes. However, because the observed effects cannot be attributed to a cause without an experimental research design, we can only speculate on the cause. Therefore, this paper will address the observed group processes and the decisions behind those processes from both the students' viewpoints and from the literature.

Student Reports of Group Processes

Initial Roles and Group Processes

Group One

We were clearly a distance group; our four members resided in Alabama, Mississippi, North Carolina, and Alaska. At the beginning of the project, the roles were loosely defined via the Team Charter, a document required as part of the group assignment. In the charter we stated that the roles were to be rotated on a weekly basis, and that we would meet for one hour on Monday evenings via on-line chat with more meetings to be scheduled as necessary. Then, as we moved through the Needs Assessment process and the scope of the project became more clearly defined, each group member volunteered to take responsibility for one aspect of data collection and research. However, no one person was assigned to a specific position, such as group leader or secretary.

Group Two

Our group consisted of three members who all lived locally, were in the Masters program, and worked full time. Our first contact was made through e-mail, in which we exchanged information in an effort to get to know each other, talk about personal schedules and best methods of contacting each other. The content of the first email included an agreement that the members would be honest with each other about each other's efforts, discussion about the team charter, and questions to pose to the primary stakeholders in our Needs Assessment (NA) project. The final charter, developed through e-mail and phone conversations, described the mission of the group, the team members, the division of tasks, a code of ethics, and guidelines for group processes. The guidelines included a meeting schedule via live chat on Wednesday evenings (the only free evening all members had).

The group came to campus for a face-to-face meeting, where we identified some of problems the NA needed to address, and set a plan for the assessment and discuss future meetings. This face-to-face meeting also helped create a more cohesive atmosphere in the group.

Group Three

Our group consisted of three members who all lived locally. From the outset of the project, e-mail was our primary means of communication. In our initial email we developed a team name, "The Three Amigos", which we felt would help us develop a good working rapport and have a sense of ownership of the project.

Our team charter included the group objectives, purpose statement, group characteristics, and the steps necessary to achieve a successful report. In addition, the team charter included initial responsibilities by group members. However, an important factor of the charter was the flexibility of the team members to assure the responsibilities were accomplished.

After a team member completed any given task, they were to email it to the other members for review. All members had input for possible improvements of the task. After the editing process, the task was emailed for final approval of all group members. Once final approval was established, the task would be put into action.

Transformation of Roles and Processes

Group One

After the first two weeks of the project, processes and roles required modification. For starters, the first two on-line chat meetings were arduous and produced few results. The meetings frequently ran well over time and were often derailed by unimportant details. To cope with this, the group assigned the roles of facilitator, recorder, and timekeeper, which were rotated on a weekly basis.

Over the following weeks, the weekly facilitator became much more assertive and began to take charge of the meetings by setting the agenda and directing an order of response among the members to avoid members from stepping on each other. Additionally, the group used a series of codes to indicate when they were continuing with a thought or an idea was completed. This technique eliminated unintended interruptions and greatly helped the flow of meetings. As a result of the adjustments to the on-line meetings, the meetings became a productive format for communication and were often completed early.

As the project continued and research data and draft reports were submitted, the group began to take advantage of document sharing and e-mail as a primary means of communication. The use of document sharing allowed each member to view a document and post corrections or give input, which helped the group keep a running record of corrections and changes and insured

that everyone had access to all of the material. E-mail was used to notify group members when an item had been posted to document sharing and also served as an asynchronous meeting forum.

Group Two

We continued to use multiple forms of communication throughout the process, including meeting face-to-face on four occasions. The face- to-face meetings were used to assign the data gathering tasks, to interpret the subsequent data, develop conclusions and set an outline for the final paper. All communication from that point forward was via email and phone.

While the team charter served as foundation for our group processes, it evolved during the process. With this being said, the group did function well but not without complications.

Group Three

Despite the fact that all group members lived locally, the team members never met face-to-face. The group decided early on that the best method of communication for our working lives was via email and continued with this format throughout the process. Jobs, families, and extracurricular responsibilities negated the possibility of utilizing a chat room. Using the asynchronous meeting method of e-mail, no more than two days passed without correspondence among the team members. Communication about assignments or even a kind word to boost morale was frequent, even daily.

Areas for Improvement

Group One

Because of the successes we experienced in overcoming the obstacles of a truly distance group project, our attitudes toward group processes are much more positive. Based upon this experience, we would implement the organizational tools of the meeting agenda and communication format earlier in the process if required to do another distance group project.

Group Two

We felt that the group would have performed better if we had elected a functional leader to ensure good communication, create backup files for all group members, and create a more structured team charter and adhere to it. However, we felt that the overall group experience was positive and was a great learning experience for future group work.

Group Three

We felt that our success during the project was attributed to the flexibility of the group. While the team charter was established as a blueprint for group function, the team members' willingness to adapt to extenuating circumstances, e.g. one team member suffered a tragedy and needed their workload lessened, was symbolic of the team's name, "The Three Amigos."

Conclusions or Lessons Learned

Waters and Napier (2002) associate effective collaboration to that of an onion sliced in half. The half onion has several layers that are dependent and interrelated with each other. The layers include: getting organized, building trust, establishing communication, getting acquainted, and providing support. To effectively complete an assignment, a group would have to successfully work through the various elements.

In their study on collaborative problem solving in a computer-mediated environment, Uribe, et al. (2003) found that "collaborative learning is a more effective strategy for problem-solving skills than individual learning" (p. 17). However, they noted that there are some drawbacks to the communication process on line, one of which is the increased time needed in an online collaborative environment. Indeed, time proved to be a major factor in determining how Group one structured their use of the available technology tools. The following are several excerpts, about time, from the focus group interview.

> *Group One*: Using "Central standard time" because we had people in the group that spanned over three time zones...we had to find a specific time that was good in North Carolina and it was also good for the person in Alaska, not too late for the person on the east coast and not too early for the person on the west coast. ...we also learned that what we thought would be no problem to just schedule a second meeting in a week if we needed to that it was really hard. It was hard enough to just get one day and one time that everybody could meet for an hour but to try to put that second meeting in there was very, very difficult.

Based upon the difficulties of scheduling over time zones and around each other's schedules, Group one devised a system for organizing their online group time in the Chat room:

> *Group One*: There are two different ways that we maximized our on-line chat process, the first one we kind of set up some guidelines, like if you are not finished with a thought...don't wait...don't spend 10 minutes writing a six line paragraph do it in kind of small chunks but put three dots at the end to say 'hey, I am not finished with this thought but here is what I got so far'. Also, a period at the end if you are finished with your thought and if you want to address you response to a particular person then end the sentence with their name at the of it, so they know they are the one that is supposed to respond. That helped make things flow a little better. But what (group member's name) really did was put out an Agenda before the meeting was supposed to start so that when we got into the chat room one person was assigned the timekeeper and another person kept track of action items. The meeting followed the agenda. It went down item by item and we stayed with the time that was allotted, we had a rotating facilitator who ran each meeting and identified each item and then the next item on the agenda then stated, 'I want to hear what you have been doing for the week...'

Uribe, et al. (2003) state that the promotion of dialogue in the computer-mediated environment seemed to improve understanding and thereby decrease transactional distance. The theory of transactional distance states that distance is a pedagogical, rather than geographical, phenomenon, and therefore overcoming the distance can be accomplished through instructional design strategies that promote interaction (Moore and Kearsley, 1995). As stated earlier, the course tool limited some of the design decisions about interaction.

However, based upon the interactions within the three groups described earlier, it appears that the personalities and experiences of the individual members of the groups also played a role in their interactions. One group member stated that:

> ... I had three in my group, you had three in your group....I am of the opinion with different personality types, the more you get in a group, there is going to be at least one or two conflicting personality types.

In an online course this conflict can be exacerbated by the difficultly of developing interpersonal relationships, due to the inherent lack of communication cues, e.g. body language, tone of voice, and facial expressions. Furthermore, Bonito (2001) suggests that those participants who are more experienced or have more knowledge related to the subject will participate more. In fact, for Group three this was an issue at the beginning of the project:

> *Group Three*: I think my group was kind of in a unique situation because two members of our group were PhD students and another was not and I remember her saying specifically, early on....she was a little intimidated, I guess she thought we were going to speak a different language ... we assured her that we were there to help her as much as she is there to help us.

The last quote also hints at a common theme in the focus group interview- trust. For example, when discussing past experiences in group projects the group members stated:

> *Group three*: ...but in a group where I don't know one of the other three members, it is just difficult to trust. It is difficult to trust people you don't know... Although, it was not hard to gain trust within the group because I was in a group where they all did their work.
>
> *Group one*: It's not just trusting them to do their work but also trusting them to do your work

In addition to content knowledge, there is the issue of technological experience. While, the course management tool offered a user-friendly interface, as Blocher, et al. (2002) states, the individual learner still needs to have a familiarity and comfort level interacting with such

technological tools. For at least two groups, the level of technological experience did factor in at the beginning of the group project.

> *Group One*: now that I think about it, we had a huge difference in comfort level of the technology within the four group members. I mean just an unbelievable space between the most comfortable and the least comfortable.
>
> *Group Two*: The use of technology was the other distance problem …I had never used the chat room before. Again it is a problem, if you have one person who doesn't know how to do something.

Collaborative learning in the classroom can have a profound impact on students' ability to function as part of a team outside the classroom. Johnson, Johnson, and Smith (1998) point out that when faced with differing points of view from other members of the group, a student will tend to become uncertain about his or her position, search for additional information to support that position, and refine that position into one upon which all members can agree. However, it is important that the pedagogy behind the design of any group project facilitates trust between members, varies the levels of experience within the group, and lessens the transactional distance.

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