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ABSTRACT

Two investigators developed a Web-based teambuilding instructional and activities module to improve the collaboration skills of team members involved in online collaboration. This module was formatively evaluated using 24 graduate students who were enrolled in an online course that assigned two online team projects during the Fall 2000 semester. The objectives of the investigation were: (1) to explore whether or not online learners valued the virtual teambuilding (VTB) instruction they received as preparation for online team projects; (2) to explore how online learners who received specific instruction on online teambuilding perceived their actual collaboration experiences as members of a virtual team; (3) to determine the online collaboration skills online learners gained after they had completed the module; and (4) to determine whether learners believed that they would use the online teamwork skills and knowledge they gained from the instructional module in future online collaborative teams. Both quantitative and qualitative data indicated that students were satisfied with the teambuilding instruction and their virtual team experiences, gained online collaboration skills and indicated they would apply these skills to future online collaborative projects. These findings imply that educators who teach online graduate courses and assign online team projects should consider integrating online teambuilding instruction into their coursework and study the value of this instructional approach for their students. (Contains 47 references.) (Author/AEF)

Building a Team Collaboration in the Virtual Classroom

By: Wallace Napier & Lisa Waters

Building Team Collaboration in the Virtual Classroom

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Abstract

The benefits of collaboration and team skills have long been recognized in both business and academic settings. In a study involving a team of business professionals performed in 1967, Maier concluded that teams have a distinct advantage over individuals in that they have a greater pool of knowledge, receive more input and solutions to problems, and encourage a better collective acceptance and understanding of group decisions. A more recent study of student teams concluded that team projects develop individual collaborative skills, strengthen both individual and group commitment to teamwork and prepare students for the 21st century workplace (Rooney, 2000).

In online collaborative learning situations, however, research suggests that team assignments can often frustrate and annoy students (Bowen, 1998). Teams must deal with new expectations, attitudes, boundaries, and responsibilities which can all cause clashes (Joinson, 1999). Further, since the tendency of online learners leans toward self-direction, students have a natural resistance to team projects where outcomes rely upon the input of others (Ko & Rossen, 2001).

Two investigators developed a web-based teambuilding instructional and activities module to improve the collaboration skills of team members involved in online collaboration. This module was formatively evaluated using 24 graduate students who were enrolled in an online course that assigned two online team projects during the Fall 2000 semester. The objectives of the investigation were: 1) to explore whether or not online learners valued the VTB instruction they received as preparation for online team projects, 2) to explore how online learners who received specific instruction on online teambuilding perceived their actual collaborative experiences as members of a virtual team, 3) to determine the online collaboration skills online learners gained after they had completed the module, and 4) to determine whether learners believed that they would use the online teamwork skills and knowledge they gained from the instructional module in future online collaborative teams.

Both quantitative and qualitative data indicated that students were satisfied with the teambuilding instruction and their virtual team experiences, gained online collaboration skills and indicated they would apply these skills to future online collaborative projects. These findings imply that educators who teach online graduate courses and assign online team projects should consider integrating online teambuilding instruction into their coursework and study the value of this instructional approach for their students.

Statement of the Problem

With the advancement of technology, online instruction that often involves team projects is becoming more prevalent (DeNigris & Witchel, 2000). As this trend is still fairly recent, there are major discrepancies between the available resources to increase the effectiveness of instructors who teach online and the resources available to instructors who teach face-to-face. Hara and Kling (2000) found that the quality, quantity, and accessibility of materials available to online teachers are inadequate.

Although there has been an increase in the frequency of educational teams, it has not been matched with adequate teacher training in collaborative group processes to promote team potential, team productivity, and team maintenance (Trimble & Irvin, 1996). Moreover, the members of teams could also use training in areas like team problem-solving, conflict management, and meeting management (Joinson, 1999; Mazany & Francis, 1995).

The title of this paper, *Building Team Collaboration in the Virtual Classroom*, uses two terms, *team* and *collaboration*, which may appear at first glance to be redundant. People do not become collaborators, however, merely because they are grouped into teams. Just like any other ability, effective collaboration involves a set of skills that needs to be learned and cultivated. This becomes especially important in a virtual realm where team members may not be able to meet face-to-face.

The benefits of collaboration and team skills have long been recognized in both business and academic settings. In a study involving a team of business professionals performed in 1967, Maier concluded that teams have a distinct advantage over individuals in that they have a greater pool of knowledge, receive more input and solutions to problems, and encourage a better collective acceptance and understanding of group decisions. A more recent study of student teams concluded that team projects develop individual collaborative skills, strengthen both individual and group commitment to teamwork and prepare students for the 21st century workplace (Rooney, 2000).

In online collaborative learning situations, however, research suggests that team assignments can often frustrate and annoy students (Bowen, 1998). Teams must deal with new expectations, attitudes, boundaries, and responsibilities which can all cause clashes (Joinson, 1999). Further, since the tendency of online learners leans toward self-direction, students have a natural resistance to team projects where outcomes rely upon the input of others (Ko & Rossen, 2001). How, then, can online collaborative teamwork be optimized so that online team experiences will be satisfying and successful?

Review of the Literature

Teambuilding Training

Barker and Franzak (1997) believe that it is "prudent" for educators to provide needed experience and information to prepare students to be better team members. For online teams, this training should also include technical support and technology training on the hardware and software used to support online teamwork (Duarte & Snyder, 1999).

Team training and development should also be ongoing to include teambuilding interventions that are matched to the specific needs of the team. For example, an intervention to improve problem-solving skills may have little impact on a team experiencing difficulties developing workflow processes. Similarly, McClure and Werther (1993) determined that specific team interventions that target personality characteristics assisted teams in identifying and resolving personality-based barriers by improving interpersonal communication and teambuilding.

Team lifecycles should also be carefully considered before implementing training. Teams exist on a continuum: from short-term project teams to relatively permanent teams (Tannenbaum, Beard, & Salas, 1991). Druskat & Kayes (2000) propose that many popular teambuilding models are inappropriate for short-term project teams. For example, the conflict depicted as inevitable during the "storming" stage of Tuckman's (1965) team-development model (i.e., forming, storming, norming, performing) might confuse or obstruct short-term project teams whose lifecycle is too brief to benefit from this information (Porter & Lilly, 1996).

Finally, in educational settings, teambuilding interventions that encourage establishing clear responsibilities, procedures, and due dates for team members may have some positive impact on team performance but may also reduce exploration or risk-taking among team members that they might otherwise use to seek answers and make decisions, which could compromise team learning (Druskat & Kayes, 2000).

Elements Found in Successful Teams

Successful teams share certain characteristics or traits. For the purposes of this investigation, these characteristics or traits were labeled "elements found in successful teams." These elements included receiving organizational or instructor support, becoming acquainted with team members, establishing effective communication, building trust, and developing effective online organization strategies (DeNigris & Witchel, 2000; Duarte & Snyder, 1999).

Receiving Support

The literature often cites organizational and management support as the major factor in team success (Berry, Avergun, & Russ-Eft, 1993; Haywood, 1998). In educational teams, a lack of support from the instructor causes anxiety and frustration among students and adversely affects team effectiveness (Hara & Kling, 2000). Oliver, Omari, and Herrington (1998) recommended that online instructors should *scaffold* their support to students. They describe *scaffolding* as providing increased support at critical times, such as at the beginning of instruction when students must learn new information or skills, and tapering off as students become more experienced.

The element, "support," encompasses providing encouragement, information, and resources; responding to team requests promptly; helping to provide team direction; acting as an arbitrator; and backing the decisions of teams (Duarte & Snyder, 1999; Eales-White, 1997; Haywood, 1998). In knowing what constitutes receiving support, team members can play a more active role in obtaining it.

Getting Acquainted

Berliner (1991) wrote, "education—even when carried out with personal computers—is an inherently social process" (p. 50). Although building relationships in online environments is difficult, it is essential to team effectiveness (DeNigris & Witchel, 2000; Haywood, 1998). Research has indicated a positive link between team member relations and team performance in both short-term teams (Druskat & Kayes, 2000) and in long-term teams (Druskat, 1996; Goodman & Leyden, 1991). The familiarity that individual members develop within their teams helps them to predict each other's behaviors and match their strengths and interests to tasks (Cannon-Bowers, Salas, & Volpe, 1995).

The element, "getting acquainted" encompasses sharing cultural information which includes sharing beliefs, values, assumptions, and opinions; personal information that includes sharing interests, hobbies, work life, family life, personal web site, hours of availability, personal expectations of the team, types of computer connections, equipment, and skills (Duarte & Snyder, 1999; Haywood, 1998).

Establishing Communication

Much of human communication is inherently ambiguous. In face-to-face situations, however, people are more apt to resolve these ambiguities. As Hara and Kling (2000) found in a study of graduate students who were taking an online course, resolving communication ambiguities can be much more difficult in synchronous and asynchronous online situations where the primary means of communication is written text. In a separate study of graduate students enrolled in an online educational technology course, Talley (1997) found two underlying problems specific to online communication and distance education: 1) students who easily communicate face-to-face found online contact more difficult due to limited typing skills, and 2) synchronous discussions required a speed of response and attentiveness that was demanding, while students generally prefer time to reflect on ideas before responding to them.

Establishing clear communication is fundamental to all aspects of online teams. For example, teams must communicate effectively in order to establish clear and specific goals and objectives so that they may function effectively as a team (Larson and LaFasto, 1989). Yukl (1994) maintains that teams that do not clearly communicate their goals will be fraught with disagreement about priorities and processes for accomplishing objectives.

Three ways to foster effective online communication include: 1) limiting interference which entails being prepared for online team meetings, being timely, using technology effectively, and asking questions when messages are unclear (Duarte & Snyder, 1999; Haywood, 1998); 2) encouraging open communication which entails being informal, incorporating humor, being honest and thoughtful, and providing motivational and positive messages to teammates (Duarte & Snyder, 1999; Hara & Kling, 2000); and 3) building rapport among teammates which entails occasionally engaging in team activities or discussions that are not work-related (Barker & Franzak, 1997, Oliver, Omari, & Herrington, 1998).

Building Trust

Geber (1995) determined that face-to-face contact was necessary to establish trust within teams. In a study of virtual organizations, Handy (1995) corroborated Geber's conclusion when he proposed that trust may not be possible in global virtual teams because it requires "touch," that is, direct face-to-face exchanges. Conversely, Jarvenpaa, Knoll, and Leidner (1998) found a positive relationship between the levels of trust and the amount of cohesiveness, satisfaction, and perceived effectiveness among online team members. According to Jarvenpaa and Leidner (1998), although the usual cues used to convey a sense of trust, such as warmth, attentiveness, and other expressive behaviors, are somewhat lacking in the virtual realm, experienced online team members display trust behaviors in other ways. That particular trust, however, is delicate and provisional.

While developing trust in a virtual environment requires a more conscious and planned effort (Duarte & Snyder, 1999), once it is developed, trust enhances group learning and development (Braaten, 1974; Mann, 1975) and it allows teams to manage conflict more effectively to become more productive and creative (Dee, 1995). Conflict is a reality of team experience and the willingness and ability to resolve personal conflict is crucial to team success (Hequet, 1994; McClure & Werther, 1993). Although several researchers recommended the golden rule, "treat others as you would like to be treated" for resolving conflict and building trust (Dee, 1995; DuBrin, 1995; Gardenswartz & Rowe, 1994). Kezar (1998) and Manz, Neck, Mancuso, and Manz (1997) suggested a somewhat modified golden rule that embraced the diversity found in online teams. They urge team members to discover how other people on their team want to be treated and then act accordingly.

In online teams, the element, "building trust" encompasses acting with integrity toward teammates, respecting others, committing to the team effort, resolving conflict constructively, being reliable, and being honest (Duarte & Snyder, 1999; Haywood, 1998; Iacono & Weisband, 1997).

Getting Organized

The research of Langer (1997) and Druskat & Kayes (2000) revealed an inverse relationship between clearly defined project goals and learning. Specifically, a decrease in structure and specifics of a project results in an increase in learning and vice versa. Langer (1997) describes this phenomenon as the need for "mindfulness" or thought and attention to changing ideas and circumstances, which, she argues, increases learning. Conversely, other studies involving project teams revealed that developing clear plans, goals, and priorities is positively associated with team efficiency (Ancona & Caldwell, 1992; Ko & Rossen, 2001) and performance (Porter & Lilly, 1996).

Duarte and Snyder (1999) described a virtual environment as inherently chaotic and advocate the use of clear procedures and organization guidelines within online teams. In their book on virtual teams, they outline several strategies, tools, and techniques to help online teams be more organized and, they argue, be more satisfied and successful. For example, they use checklists and worksheets to highlight critical success factors found in effective teams; they provide sample agendas to help confirm team missions; and they use scenarios and exercises to encourage spontaneous and reflective thinking to develop problem-solving skills.

In online teams, the element, "getting organized" encompasses selecting a team leader, recognizing and rewarding team accomplishments, facilitating team meetings, developing team norms, instituting workflow procedures, creating time lines, and selecting the appropriate technology and method for team interactions (Duarte & Snyder, 1999; Haywood, 1998).

Conclusion

Research that emphasizes the value to learners of online instruction that includes collaboration (Druskat and Kayes, 2000) coupled with findings concerning the discrepancies and poor quality of online resources available to instructors (Hara and Kling, 2000), underscore the need for developing more resources on online teambuilding.

The literature review also calls attention to the need for further research of virtual teams. Hara and Kling (2000) encouraged further research on the impact of support on students enrolled in online classes. They point to problems and disappointments of students who lack the support they need to be successful in online courses. Based upon this collection of research, guidance from instructors, content experts, and peers, a web-based instructional module on teambuilding was developed to aid both students and instructors who are involved in online courses which have team projects.

Methodology

During the Summer 2000, two investigators collaborated to develop a web-based teambuilding instructional module (module) to be used as part of an instructional design study. The investigators developed instruments to measure various aspects of learners before and after the learners completed the module. The purpose of the module was to improve online collaboration skills and attitudes of people who produced online projects as teams. The investigators worked together to implement the module and to gather data focusing on teambuilding skill levels of online learners and on general attitudes toward teambuilding instruction and the collaboration process.

Online Teambuilding Instructional Module

The online teambuilding instructional module consisted of an online *PowerPoint* presentation and an activity worksheet. It provided practical information and practice with elements found in successful online teamwork. These elements included information on receiving organizational or instructor support, becoming acquainted with team members, establishing effective communication, building trust, and developing effective online organization strategies. The instructional module created for this study followed a modified version of Dick and Carey's (1996) Instructional **System Design Model.**

The module was web-based and was accessible to learners via a virtual teambuilding (VTB) web site designed by the investigators. Learners who did not have high-speed Internet access were provided with a duplicate version of the teambuilding *PowerPoint* presentation that was downloadable to their computer desktop.

The web site housing the module also included a Pre-Course Survey and Post-Teamwork Survey. These surveys measured learner satisfaction with his or her team projects, and the skills they gained for online collaboration following the instruction they would receive from the module. Data on prior experience with relevant online collaborative technologies was also gathered using these surveys and was to be used to group learners of the study into teams for purposes of collaborating on team projects.

Objectives

There were four objectives for this study. The first objective was to explore whether or not online learners valued the VTB instruction they received as preparation for online team projects. This objective was measured in terms of: 1) online learner satisfaction with the two components that comprised the instruction: an online *PowerPoint* presentation on virtual teambuilding and a teambuilding activity worksheet, and 2) online learner perceptions of instruction as contributing to their individual personal growth as learners and educators.

The second objective was to explore how online learners who received specific instruction on online teambuilding perceived their actual collaborative experiences as members of a virtual team. This objective was measured in terms of online learner satisfaction with individual team experiences encompassing elements found in successful online teams: receiving support, getting acquainted, building trust, building communication, and getting organized.

The third objective was to determine the online collaboration skills online learners gained after they had completed the module. This objective was measured by comparing results from individual pre-course surveys with post-teamwork surveys that contained specific questions about knowledge and skill levels when working in online collaborative teams.

The fourth objective was to determine whether learners believed that they would use the online teamwork skills and knowledge they gained from the instructional module in future online collaborative teams. This objective was measured by the responses students gave concerning their attitudes toward using the online team skills they developed in future online collaborative situations.

Target Audience

The target audience for the teambuilding instructional module is adult learners who are engaged in online, collaborative projects as part of a virtual team. The ultimate intended purpose of the module is to be available to any person who has Internet access at anytime and at any location. Additionally, while it was written in English, the overall theme, the language, and graphics used throughout the module were specifically designed to be inclusive of other cultures.

Participants

This study addressed itself to a sample drawn from a group of graduate students who were enrolled in an online course. This course was being offered at the University of Hawaii, Manoa (UHM) for the Fall 2000 Semester. The instructor for this course had extensive experience with the content of the course and with distance learning. Course content, schedules, and feedback were given via an online university network called Web Course Tools (WebCT). This particular class was selected because it represented the target population in that it contained a mix of male and female adults from various ethnicities who were involved in online collaborative projects.

There were a total of 27 students enrolled in the online course—10 male and 17 female. The cultural backgrounds of the students were Chinese, Swedish, Hispanic, Japanese, Filipino, and Caucasian American. This module was administered to 24 of the 27 enrolled students. Two students opted not to participate and one student was disqualified because she was also one of the investigators. Although only the results of 24 of the 27 students were considered as part of the study, the whole class received the same treatment.

Procedures

This module was administered to all students enrolled in the Fall 2000 online class. Before the class began, the instructor and an investigator, in the role of Teaching Assistant, sent out a surface mail letter and an email to prospective students to provide them with general course information as well as to describe the VTB web site and how to access it.

In order to incorporate the online teambuilding module, the instructor designed an introductory unit. This unit contained the first graded assignments for the course. Assigning grades to the Teamwork Unit and online team projects provided incentives to the learners.

For the first teambuilding session, students were to meet in an online chatroom in WebCT with their instructor and the course Teaching Assistant. It was mandatory for every student to be present, but they had the option of meeting in a morning or evening session. There were no other mandatory online meetings scheduled.

Access to the course site, which contained a link to the VTB web site, was permitted a few days before class actually began. The VTB site outlined six steps that students would need to follow in order to complete the teambuilding process.

Step 1 was to fill out an electronic Pre-Course Survey form. A link was provided to the survey. The survey contained items concerning demographics, types of computer and Internet connections, student online experience levels, and experience levels of students with virtual teams.

Although students were required to participate in the Pre-Course Survey, several items on the survey were optional. At the bottom of the survey form, students were notified that information from their surveys was requested to be used in the teambuilding study. Besides investigative purposes, the information from the surveys was also used to establish heterogeneous teams. For example, to provide students with a greater chance of success when placed on teams, the investigators used the Pre-Course Survey data to optimize the placement of students onto teams in the following ways: 1) to equip the online teams with the optimum number of three people (Stadtlander, 1998), team assignments were planned that way; 2) to facilitate transferring data among team members, students were matched according to computer types, that is, PC or Macintosh; 3) to provide a range of experience levels and genders, student teams were deliberately mixed.

After completing the Pre-Course Survey, students were instructed to view the twenty-minute *PowerPoint* presentation entitled, "Recipes for Satisfying and Successful Virtual Teams," that was developed by the investigators. It was listed as Step 2 of the teambuilding process. They could view the presentation online or download it to view it from their computer desktops. At the end of the presentation, students were given an opportunity to print a copy of the presentation for future use.

In keeping with the cooking theme of the presentation, the elements of satisfying and successful teams were broken down into "ingredients." Haywood (1998), and Berry, Avergun, and Russ-Eft (1993) established "support" as the most essential ingredient for satisfying team experiences, so a checklist was developed for the instructor to go through with the class in a virtual chatroom describing how she would support the teams. This online class chat was labeled Step 3 of the teambuilding process. The checklist provided a general topic outline for the instructor to follow as she talked with the students. The instructor committed to support the teams by being available to act as an arbitrator, providing key information, and helping to guide teams toward the project goals. She also pledged to be available when called upon for assistance, but not to exert undue influence on the creativity or bonding of team members. At the end of the chat session, students were provided with a list of their teammates for the two assignments requiring teams.

Step 4 of the teambuilding process involved students making arrangements with their teammates to meet in a virtual chatroom to engage in teambuilding activities together using the worksheet as a guide. They were encouraged to do this as soon as possible because they only had one week to complete the activities. The activities were provided to the students as a printable activity worksheet available from the VTB web site. Students were directed to read through the activities before meeting with their teammates so that they would become familiar with what each of the activities involved and have some time to reflect on the questions. It was anticipated that these directions would facilitate the first online team meeting and make it as productive as possible.

Step 5 of the teambuilding process involved students posting individual results of their online team meeting including reflections, comments, and questions they had regarding the teambuilding activities and the teambuilding process in general in an online Teambuilding Forum.

Once the two required collaborative projects were completed, students were directed to go to the VTB web site to take a Post-Teamwork Survey. This was labeled Step 6 of the teambuilding process. The survey was used to explore student perceptions of their team experiences, the role of the module in their perceptions of their team experiences, the role of the module in increasing their online collaboration skills, the likelihood that they would apply the skills they learned in future online teams. Finally, at the end of the Post-Teamwork Survey, a comment section was provided. Students were urged to provide feedback about the teambuilding instruction and activities, the personal experiences they had in the assigned online teams, and their satisfaction with their team experiences.

Instruments

Three research instruments were used to gather demographic data and to measure student satisfaction levels. These included a Pre-Course Survey, Post-Teamwork Survey, and electronic postings to an online Teambuilding Forum where students discussed experiences with the online instructional module and team experiences in general. For purposes of confidentiality and analysis, the electronic postings were condensed to comments related specifically to student perceptions about the module and team experiences.

Data Gathering Process

Data generated by two online surveys, arranged chat sessions, and electronic Teambuilding Forum postings were used to obtain data relating to skills gained and satisfaction levels of students who developed online team projects. Participants released these data for the purposes of this study.

Data Analysis and Results

Four objectives were measured for this study using quantitative and qualitative data. Multiple-choice questions were used to measure quantitative data and were collected from two surveys: the pre-course survey and the post-teamwork survey. Comments from the online learners were used to provide qualitative data and were collected from chat sessions and the electronic Teambuilding Forum postings.

Survey Questions

The first objective was to explore whether or not students valued the VTB instruction they received as preparation for online team projects. Overall, responses indicated that this objective was met in terms of student satisfaction with the two components

that comprised the instructional module, and student perceptions of instruction as contributing to their individual personal growth as learners and educators. Twenty-three out of the twenty-four students indicated that they valued the VTB instructional module.

The second objective was to explore how students who received specific instruction on online teambuilding perceived their actual collaborative experiences as members of a virtual team. An overwhelming majority of the student responses indicated that they were satisfied with individual team experiences encompassing elements found in successful online teams: receiving support, getting acquainted, building trust, building communication, and getting organized.

The third objective was to determine the online collaboration skills students gained after they had completed the module. Twenty-two of the students out of twenty-four acknowledged that they gained skills and knowledge essential to online collaboration.

The fourth objective was to determine whether students believed that they would use the online teamwork skills and knowledge they learned from the instructional module in future online collaborative teams. More than twenty of the students indicated that indeed they would use these skills and knowledge.

Student Comments

To substantiate some of the numerical data gathered, the investigators asked students to comment on various aspects of the module and their online team experiences. The following themes emerged from the data: *receiving support, getting acquainted, establishing communication, building trust, getting organized, teambuilding presentation, teambuilding activities, teambuilding module,* and *overall team experience.*

Receiving Support

There was only one comment that related specifically to student perceptions of the online support they received and it was positive: "I enjoyed this course and appreciate the hard work and dedication of the teaching assistant and the instructor."

Getting Acquainted

A total of 11 comments related specifically to student perceptions of how well their team became acquainted. Again, these comments were all positive ranging from, "[I] felt very fortunate to have two good teammates" to "**GO TEAM!**"

Establishing Communication

There were a total of nine student comments concerning communication. One student wrote, "Our backup communication plan is [first] external email and then by telephone." Other student comments were somewhat more revealing of their attitudes toward communication. For example, a student commented on the value of communication to the team, "We ended our chat by talking about the importance of keeping communication lines open by checking email daily and to call each other if necessary." Finally, since the module presented instruction on how to communicate more efficiently using acronyms and more expressively using emoticons, many students commented on how they felt about the instruction in these terms. Two typical comments included: "We introduced some clever and amusing emoticons and acronyms" and "Our 'favorite' emoticons and acronyms: ;-) LOL :o) :Q TTYL BRB :-) AKK."

Building Trust

There were a total of three comments relating specifically to perceptions of trust developed in teams and all were positive. A typical comment was, "...everyone was reliable and committed to the team."

Getting Organized

Eleven students commented on their perceptions of team organization. A few comments indicated a feeling that students were satisfied with how their team organized their work. For example, one student wrote, "We were able to work well together." The majority of the comments, however, were neutral, indicating methods of team organization only: "[We used] a sequential order and our editing path was determined," and "Whenever we get any files from any teammates, we will send a quick reply to inform of our receiving."

Teambuilding Presentation

A total of nine students commented on their perceptions of the *PowerPoint* Teambuilding Presentation. The majority of comments were positive: "All agreed that the teambuilding *PowerPoint* Presentation was well designed, had excellent tips, and would serve as a great reference for upcoming team projects." "The *PowerPoint* Presentation is a helpful guide for teambuilding. It was well organized and informative." There was one slightly negative comment, however, concerning the length of the presentation: "The presentation is pretty long, but it is really useful."

Teambuilding Activities

There were a total of 11 comments that related specifically to student perceptions of the teambuilding activities. Of all the comments made by students, this particular set of comments was the most revealing of student attitudes. The majority of comments were positive, with only one comment being neutral. Typical comments included: "I really enjoyed our teambuilding chat" and "The [teambuilding] exercises worked well to get us going."

Complete Module

There was only one student comment related to the complete module and it was positive: "The whole presentation is really easy to understand."

Overall Team Experience

Only one comment was related to student perceptions of the overall team experience and it was exceedingly positive: "The overall team experience definitely built my confidence to participate in similar activities in the future."

Discussion

From student responses relating to satisfaction with the entire module and its specific components, overall student attitudes toward the instructional module were favorable. The *PowerPoint* presentation component received a slightly better rating than the Teambuilding Activity Worksheet component.

The responses of the students relating to their individual personal growth as learners and educators demonstrated the value of the module. Overall, their opinions indicated that they felt their personal learning increased, their personal creativity increased, and their personal collaboration skills improved after receiving teambuilding instruction from the module and participating in online teams for the team projects. The comments from students describing their enthusiasm going into their teamwork included specific language and ideas taken from the teambuilding module they had just completed. For example, students commented on specific file naming systems they would use, types of editing paths they would implement, and ways they would communicate and build trust. It is evident that students had clear intentions derived from the module of what would make their online teamwork more satisfying and successful going into the team projects.

The students' satisfaction with the instruction of the online teambuilding module combined with their reports of increased learning, increased creativity, and improved collaboration skills help to strengthen the finding of Pascarella et al. (1998) that student satisfaction with instruction ultimately leads to success. Although Pascarella's study involved only face-to-face instruction, this positive relationship between student satisfaction with instruction and their subsequent success appears to apply as well in online courses using any type of instruction.

Student responses and comments on the Post-Teamwork Survey indicate that they did indeed perceive their online team experiences as satisfying and successful. The students rated their experiences according to the elements found in successful online teams: getting acquainted, receiving support, establishing communication, building trust, and getting organized. Students ranked receiving support as the most important element for their success as online team members. This finding supports the work of Berry, Avergun, and Russ-Eft (1993) and Haywood (1998) who asserted that receiving support was the major factor in team success.

Contrary to the expectations of the investigators who assumed that the module would be more rewarding to the students with less online technology experience, students with more experience seemed to value the module more than students with less experience. One possible explanation for the higher ratings of the students with more experience may be that these students felt more secure using an online instructional module and were able to glean more from it. This explanation lends further support to Sherry's (2000) finding that greater experience with technology reduces anxiety and fosters positive attitudes toward online technology.

Half of the comments from the students spoke directly to the applicability of the module indicating they valued the skills they learned enough to use them in their future roles as educators and collaborators. Additionally, the positive responses students made on the Post Teamwork survey reflected that indeed they would apply their skills towards future situations involving online collaboration. This may substantiate Rooney's (2000) conclusion that online collaboration is a skill necessary for the 21st century workplace.

Implications

The findings of this investigation have several implications: 1) the online teambuilding module used in this study does have an overall positive effect on team attitudes; 2) students who develop online collaborative projects and undergo online teambuilding instruction that includes teambuilding activities have a high satisfaction rate with their online teams; 3) students who learn online teambuilding skills do apply them to their online collaborative work; 4) students value the online teambuilding skills they learned to the extent that they indicated that they would apply to future online collaborative work; 5) instructors who assign online collaborative projects should consider incorporating teamwork instruction in their online classes; and 6) the elements found in successful teams, receiving support, getting acquainted, establishing communication, building trust, and getting organized, are also elements found in teams satisfied with their online teamwork.

Future Studies

Since a number of the students from this study wrote positive comments about their teammates and their experiences, the investigators believe that this may have implied that the manner in which teams were formed was done successfully. A study of the combination of characteristics used to form the teams could lead to interesting findings.

Additionally, as of this writing, the investigators have received a number of inquiries about the module from business entities. These inquiries warrant future research be conducted beyond the academic environment.

Finally, support plays a critical role in the success or failure of a team (Berry, Avergun, & Russ-Eft, 1993; Haywood, 1998). For this particular study, the investigators developed a checklist for the instructor that emphasized the important ways that she could offer her personal support to the online teams. In the future, however, a web-based information guide or pamphlet might be distributed to instructors describing specific ways that they can support online teamwork.

The researchers for this investigative study developed workshops to instruct faculty members at the University of Hawaii at Manoa and at Hawaii Pacific University on how they might support virtual team collaboration for their online courses. Overall, the workshops received positive feedback from the attendees. Evaluations from these workshops and others like it may also contribute to a database for further research.

VTB Web Site Access

The overwhelming positive response from students combined with the enthusiasm of educators and business professionals have led the researchers to currently work towards marketing their VTB module. However, at present, they do allow educators full access to it in return for feedback on its usefulness and suggestions for its improvement. To view a web site that provides

samples taken directly from the full VTB web site, please visit: <http://members.home.net/vtbsolutions>. You may also email the researchers to request permission for access to the full VTB web site at: <vtbsolutions@hotmail.com>. Please include your name, title, institution, and how you would like to use the web site.

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