# A DESIGN CASE FOR IMPLEMENTING A COLLABORATIVE STRATEGY FOR ONLINE TEAMS

Funda Ergulec[1] & Janet Mannheimer Zydney[2]

[1]*Osmangazi University*; [2]*University of Cincinnati*

This paper describes a half semester long curricular and instructional design project focusing on the design and implementation of a collaborative strategy into a fully online graduate class in adult education. The purposeful group assignment and team building strategy, collectively called the collaborative strategy, represents an instructional approach designed to increase the effectiveness of online collaborative learning. In this context, students are strategically assigned to teams based on their study habits, and they participate in several team-building activities designed to maintain the collaborative learning. This paper presents critical design decisions made during the course development, the reasons for those decisions, failures in which the design did not work as planned, and a reflection on the design.

**Funda Ergulec** is a post-doctoral researcher in computer education and instructional technology department at Osmangazi University. Her research interests include instructional design strategies and development of e-learning environments.

**Janet Mannheimer Zydney** is an associate professor at the University of Cincinnati in instructional design and technology. Her research interests include scaffolding in e-learning environments to improve students' critical thinking.

## INTRODUCTION

This design case focused on the iterative design-and-implementation process of integrating the collaborative strategy for group learning into an online course over one semester. The iteration is described in a narrative format in this paper, which provides an overview of the project including instructional needs for the implementation, the design process, design failures, and reflection.

The benefits of collaborative and cooperative learning are well documented in the literature (Dillenbourg, 1999; Oakley, Felder, Brent, & Elhajj, 2004; Palloff & Pratt, 2013), and considerable research on the benefits of collaboration in teaching and learning is available; however, ways to appropriately assign students into groups has not received equal attention. Although researchers agree that grouping strategies play an important role in successful collaborative learning environments (Palloff & Pratt, 2013), little research has addressed what strategies are critical in creating such environments (Roberts & McInnerney, 2007; Smith et al., 2011).

To address this need, the authors designed a *collaborative strategy* that combines purposeful group assignment and team building activities. The purpose of this design case is to write and reflect on designers', instructor's, and students' experiences of a course that used this collaborative strategy. The critical aspects that played a role in designing and applying the collaborative strategy are: (a) group cohesion; (b) group composition; and (c) positive interdependence.

### Group Cohesion

Cohesion is a multidimensional construct, which includes members' ability to work as a team, individuals' commitment to the team or team members, and their sense of unity (Forsyth, 2010). Some group cohesion activities influence the collaborative work in online environments include: social skills and relationship-oriented exchanges (e.g., Carson, Tesluk, & Marrone., 2007; Haythornthwaite, 2008; Hüffmeier & Hertel, 2011), check-in frequency and timeliness (e.g., Broadbent & Poon, 2015; Kerr, Rynearson, & Kerr, 2006;

Michinov, Brunot, Le Bohec, Juhel, & Delaval, 2011), and procrastination (Michinov et al., 2011; Rakes & Dunn, 2010; You, 2015). In the collaborative strategy used in this design case, the instructions included several icebreaker activities designed to help create a sense of togetherness.

## Group Composition

In the literature, various attributes of a group's composition have been determined to affect collaborative learning environments, such as group size (Cohen, 1994; Johnson, Johnson, & Holubec, 1994), personal characteristics (Kichuk & Wiesner, 1997; Sabry & Baldwin, 2003), and group formation (i.e., allowing students to choose their own groups, random assignment, or instructor formed groups) (e.g., Chapman, Meuter, Toy, & Wright, 2006; Feichtner & Davis, 1984; Oakley et al., 2004; Sahin, 2011). In the collaborative strategy employed, students were assigned to groups of three based on their study habits.

## Positive Interdependence

Positive interdependence exists "when individuals perceive that they can reach their goals if and only if the other individuals with whom they are cooperatively linked also reach their goals and, therefore, promote each other's efforts to achieve the goals" (Johnson, Johnson, & Smith, 2007, p. 16). Such interdependence is an important element that helps a group to function. The following activities were used in the collaborative strategy to prepare students to facilitate group processes and collaboration: coming up with a team name, creating a team charter or stated expectations, distributing the leadership by rotating the facilitator, and writing reflections about the teamwork.

## Designers of the Course

The authors of design cases are usually the ones that are "deeply involved in the design process as a member of the design team (or as a solo designer)" (Smith, 2010). The second author of this paper was the original designer of the collaborative strategy including a purposeful group assignment strategy and several team-building activities to help maintain the teams' collaborative learning. After two implementations of the strategy in her online classes, she started to receive positive comments from her students. On the basis of these successful pilot efforts, the first author planned to implement the collaborative strategy in other graduate courses and conduct several related studies. The first author served as the lead designer of the course, and conducted this study as her doctoral dissertation (Ergulec, 2017). The instructor of the course served as a peer debriefer by reviewing design artifacts.

## Design Context

The target course, referred to as "Communications in Small Groups" (CSG) in this article for purposes of confidentiality, was an elective in the adult education program of a large midwestern university. This course was focused on helping participants learn "the fundamental principles of group dynamics, stages of group development, how individuals make contributions to move the group forward, how to build support among group members, and suggestions for dealing with dysfunctional groups" (CSG course syllabus, Summer 2015). CSG was a six-week, three-credit, fully online course, which met in an online learning management system (LMS).

All of the participants were graduate students at the host university, except one who was not enrolled in a graduate level program but took the course because he had been awarded some free graduate level credits. All of the students were employed professionals, including teachers, a clinical instructor, an academic advisor, and staff members. The participants resided in a variety of time zones, eleven in the Eastern, one in the Central, and one in the Pacific time zone. During the semester this study was conducted, the students were taking one to three courses. Most of the students had taken another class together in the previous semester, so they already knew some of their classmates before they enrolled.

The first author selected a graduate level education course as the target because graduate students in education frequently find themselves involved in online classes that employ long-term collaborative group projects, regardless of whether they have any previous online group work experience. The collaborative strategy was highly relevant to CSG, because it was about small group theory in adult education. This course had the following learning objectives: (a) to recognize one's own style of participation within groups, (b) to identify stages of group formation, and (c) to utilize strategies that move groups beyond their dysfunctions (CSG course syllabus, Summer 2015).

## Case Background

The initial collaborative strategy was developed by the second author based on her teaching experience and observations of student difficulties with online teams. Initially, the second author did not use any employed strategy for assigning students to groups, and she had some problems as a result. One day, after a long conversation with a student who felt that the problems on his team were a result of differences in study habits and schedules, she searched for a questionnaire to assess study habits. Based on questions she found from other questionnaires, she designed a study habit questionnaire in order to gather information on students for assigning them to groups. The questionnaire has been validated through an iterative process of implementing
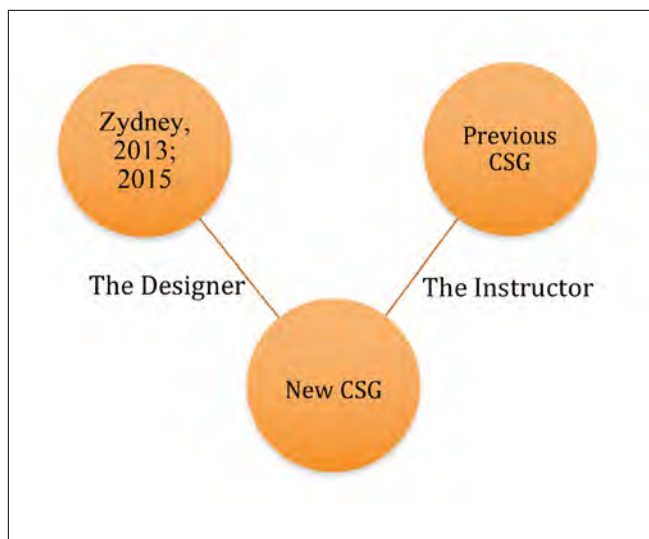
**FIGURE 1.** Snapshot of the Project.

and refining it over several years across varying contexts. Questions have been modified or added over time. For example, after one of the first iterations, a question about time zone was added to facilitate better scheduling. This validation is an ongoing process that the design team plans to continue.

She also designed several team-building activities to help teams establish a strong working basis for collaboration. The strategy was implemented, evaluated, and revised in two online courses at the University of Cincinnati (Zydney, 2013; 2015), prior to its integration into this specific course.

## DESIGN PROCESS

This design process involved the decisions that the instructor and the first author made to implement the collaborative strategy in an online course. Initially, the first author introduced the collaborative strategy to the instructor through an instructional website. The design of the website gives instructors a holistic understanding of the collaboration strategy with detailed activities and examples. Instructors can choose examples that best suit their course context or use the examples to identify activities within their courses that would fit the strategy. The website consists of three pages: group cohesion, group composition, and positive interdependence, which are the main concepts that form the collaborative strategy. The instructional website can be found at: https://sites.google.com/site/collaborativestrategy1/

### Collaborative Strategy Design Activities

The collaborative strategy includes a purposeful group assignment strategy along with team-building activities to be carried out throughout the class, which required adjustment of the whole course structure. Thus, the instructor and

first author engaged in a full course review to evaluate each module, its structure, and its sequence.

The following section includes three areas of the course: First Module, Second Module, and All Modules. First Module and Second Module provide the setup required for the purposeful group assignment strategy and the initial team building activities. All Modules includes the activities embedded throughout the remaining modules.

*First Module*

The first module includes the activities needed for the group composition as well as the ice-breaker activities required for initial group cohesion.

**Group Composition.** The students completed a study habit questionnaire to provide information to the instructor for group assignments. The questionnaire includes questions concerning such matters as when the students would like to work with other people (weekdays or weekends), whether they like to do things ahead of time or at the last minute, and what technological skills they possess. The students completed the study habit questionnaire (see Appendix A) during the first week of the course.

Based on the answers to the questionnaire, the instructor assigned students to five groups consisting of three students. Based on past experiences, the second author recommended that three in a group is the optimal group size; four is challenging, but doable; and five should be avoided because there is a tendency to leave some members out in groups of five or more members. In addition, increasing group size creates logistical difficulties in arranging meeting times for synchronous collaboration.

| MODULE ONE | |
|---|---|
| **WEDNESDAY** | • Upload a picture of yourself, and add profile information<br>• Complete the study habit survey.<br>• Take the Keirsey Instrument<br>• Introduce yourself with a hint about your temperament<br>• Write a brief review and reflection of three URLs on small group theory |
| **SUNDAY** | • Read the assigned readings<br>• Reply to at least two other students' introductions<br>• Reply to at least two other students' URLs<br>• Submit your individual reflections on team work |

**TABLE 1.** Module 1 outline.

| THINGS THAT THE INSTRUCTOR MAY WANT TO BE SIMILAR ABOUT THE TEAM MEMBERS |
|---|

- **Whether they are deadline oriented or like to plan ahead**
- **Location in the same time zone**
- Preferred days and times to work
- Personal interests
- Degree of commitment to school work

| THINGS THAT THE INSTRUCTOR MAY WANT TO BE DIFFERENT ABOUT THE TEAM MEMBERS |
|---|

- **Technology expertise**
- **Writing /language skills**
- Ability to initiate/ delegate
- Ability to edit/catch mistakes

**TABLE 2.** Criteria to consider when assigning students to teams.

The authors provided the following table to the instructor as the guidelines on how to implement the assignment

strategy in her class. It suggests criteria to consider when assigning students to teams. The bolded items in the list are the ones to prioritize when forming groups; the others are "nice-to-haves."

The authors recommended the following steps to the instructor for assigning teams. First the instructor should separate the people who like to plan ahead from the deadline-oriented people because people seem to be more comfortable working with people having the same disposition. Second, the instructor should consider time zone differences and other schedule preferences to avoid scheduling challenges, and third, should ensure tasks are fairly distributed by including a person who is strong at delegating tasks. Fourth, the instructor should include someone with technology expertise or proofreader skills, when possible, to increase the diversity of teams.

In addition to the students' answers to the study habit questionnaire, the authors recommended that the instructor consider several other factors; such as a) students' actual posting patterns to verify accuracy of information collected from the surveys, b) their introductions to see what students' interests were and with whom they chose to connect, and c) their preferences/comments for people with whom they would want to work.

**Group Cohesion Activities.** Several icebreaker activities were included in the first module to begin to build group cohesion. These introductory activities were designed to

help students feel more at ease and to strengthen the unity of the class (Palloff & Pratt, 2013).

For introductions to the whole class discussion board, students participated in an online discussion protocol called "A Hinting Game" (McDonald, Zydney, Dichter, & McDonald, 2012). Its game-like feature, by which students guess each other's hints, easily fosters connections. In Part I of this activity, students post an update to the discussion board with information about themselves. These updates can include professional interests or experiences, leisure interests, and personal information, but they have to end with a hint of something interesting and undisclosed. They can choose their own means of hinting, for example, via quotation, image, phrase, story or link. To encourage creativity, they can post their profiles using an online presentation tool such as Prezi, Animoto, or VoiceThread.

The Hinting Game protocol not only helps students to get to know each other; it also serves a content-related purpose. One of the objectives of the CSG class was "to recognize one's own style of participation within groups." To reach that goal, the students were required to take the "Keirsey Instrument" temperament test (https://www.keirsey.com/), which helped them discover their temperament type and better understand themselves and others. The "Keirsey Instrument" activity tied into the Hinting Game protocol by asking students to hint about their temperament types based on the Keirsey instrument results. This connection

| PART I—INTRODUCTIONS |
|---|

Introduce yourself. Post your introductions to the Discussion board. Your introduction should include:

- Your professional position and experiences
- Your graduate program and how far along you are in your program
- Your interests and fun facts about yourself, such as hobbies, special talents, family or pets, or anything else you want to share about yourself
- Your expectations for the course. **Due: Wednesday.**

| PART II—CONNECTIONS |
|---|

Choose at least two people with whom you identify (similar hobbies, shared personal interest, etc.) and post a reply explaining your connection to that person and offering your guess about what his or her *temperament* is. Please do not pick someone you already know. **Due: Sunday.**

At the end of the module, post a message where you reveal to everyone what your temperament is. **Due: Monday.**

**TABLE 3.** A Hinting Game protocol.

| MODULE TWO | |
|---|---|
| **WEDNESDAY** | • Read Chapter two and three<br>• Create a Google account (if you haven't already).<br>• The Facilitator for the module will create a shared Google Doc for the group to collaborate.<br>• Post your hopes and fears to your assigned group.<br>• Post a list of issues that stump you regarding either participating on a team or facilitating a team<br>• Compare two teams on the basis of Unilateral Control and Mutual Learning |
| **SUNDAY** | • Complete your shared Google Doc with team name, norms, and rotating facilitator schedule<br>• Post your reflections to 'What Stumps Me'.<br>• Post your reflections to 'Unilateral Control and Mutual Learning'.<br>• Submit your individual reflections on team work |
| **MONDAY** | • Provide feedback to the responding group<br>• Submit your individual reflections on team work |

**TABLE 4.** Module 2 outline.

would help initiate students' explorations of the different personality types.

*Second Module*

The goal of the second module was to foster the team's positive interdependence by including norming and team building activities and to continue to establish group coherence through ice-breaker activities.

**Norming.** The team members introduced themselves through the Fears, Hopes, and Norms Protocol (McDonald et al., 2012). As part of their introductions, students included a hope and a fear related to working within the group, guided by McDonald et al.'s prompts:

• "Fears: If this [team experience] turns out to be one of your worst ever, what will be its characteristics?" (p. 55)
• "Hopes: If this [team experience] turns out to be one of your best ever, what will be its characteristics?" (p. 56)

After they posted their hopes and fears, as a team, they brainstormed norms that would reduce their fears and

increase the possibility of realizing their hopes. In the course of such discussions, students might open up and reveal concerns they would not ordinarily reveal in a class, leading to a solution. For example, if one person's fear is that giving critical feedback will offend the recipient, the group may decide to establish a ground rule for how to give and receive feedback. The intent of using the Fears, Hopes, and Norms Protocol was to make sure that the teams kept what they liked, discarded what they didn't like, and developed agreed-upon norms.

**Ice-breaker Activities.** The icebreaker activity used in the second module was called "What Stumps Me" and was adapted from the previous CSG class. For this activity, students created a list of issues that stumped them regarding either participating on or facilitating a team, and then they shared those in the main discussion board. The following sentence starters were provided to guide them:

• "I really can't believe it when team members…"
• "Man, it really annoys me when team members…"
• "How many times do I have to…"
• "How can I get my team to …"

The "What Stumps Me Activity" was retained in the new design in order to help teams in the creation of their group norms.

**Team Building.** As a team building activity, each team came up with a team name. Creating a team name served as a practice activity for team members to come together and work.

*All Modules*

All of the modules included rotating facilitators and reflections.

**Rotating Facilitators.** A rotating facilitator approach enabled a different student to lead each module. Each team decided their rotating facilitator schedule based on their team members' own schedules. Distributing the leadership role was designed to help students to develop a sense of working together. Another reason for this collaborative strategy was to ensure that one person did not dominate the group, do all the work, and/or continuously assume the leadership role. By having a different facilitator each week, each team member had a chance to help with the flow of team discussions and manage the group activities.

**Reflections.** After each module, the students wrote their reflections about how well the team had worked together and how the collaboration could be improved for the following module. These reflections were intended to help students see teamwork issues from new perspectives and create ideas for resolution. Writing a reflection might help students to

see the value of the teamwork experience they had gained through practice.

## DESIGN FAILURES

After carefully reviewing data collected from discussion records, student reflections on their collaborative work, and student interviews, as well as the instructor's reflections, the authors identified several challenges faced by the students and the instructor and potential areas for improvement. Specifically, there were two main areas in which the students or the instructor struggled: (a) failed group assignments and (b) instructor's role.

### Failed Group Assignments

One team in particular ended up having members with dissimilar study habits. While one of the team members was deadline oriented and liked to have less check ins, another team member was a proactive "early bird initiator" who liked to ask a lot of questions and preferred frequent check ins. The third team member played the "low-key" role as the person who was easy-going and calm.

After groups were made, the instructor realized that some students' actual posting patterns were not completely accurate with the information from the study habit survey. For this particular team, the instructor decided to follow the other items in the collaborative strategy, rather than prioritizing whether the students were deadline oriented or liked to plan ahead. For example, one common factor was that they all reported that they would like to work very late at night during weekdays and they considered themselves very organized. One of them said that she was not really comfortable with learning new technologies on her own; whereas, the other one said she was quite comfortable with technology. Because one of the aspects of this strategy was to group people who had different skills, the instructor decided to group these students together. Even though the initial intent was to group similar study habits together, the assignment strategy failed for this team. Given the complexity of each student's personality, the grouping strategy was not able to capture some elements, which, in this case, were critical to matching study habits. Thus, prioritizing whether students are deadline oriented or like to plan ahead is crucial for the collaborative strategy to work as expected because people seem to be more comfortable working with people having the same disposition, and it appears to be more important than the other items in the collaborative strategy.

In future iterations, it might be more useful if the "what stumps me" activity had been carried out before the groups were composed, rather than afterwards as was done in this iteration. In this particular activity, students created a list of issues that stumped them regarding either participating on a team or facilitating a team. As mentioned above,

the grouping strategy was not able to capture all of the complexities of the students' personalities. It may have been more useful if this activity had had been carried out before the groups were composed. Students' responses in the activity might have provided additional information useful in assigning students to teams. For example, one student described herself as "way too task-oriented," which would have been a useful clue when determining study habits. In this kind of activity, students tended to share their thoughts about and experiences with online teamwork and provide insights into their study habits. A question about how they defined themselves within a team might be added to the activity, which could be carried out before students are assigned to teams.

However, it is not realistic to count on these strategies alone; it is necessary to pay close attention to other factors that influence the course in general and specifically the instructional design to support collaboration. For example, there is interplay among external factors, the planned strategies, and the students' experiences with them. Because students' experiences and satisfaction are influenced by what is happening among their peers, instructor, and individually, it is important to consider environmental and personal factors that may affect the instructional group strategies. Moreover, the instructor of the course may want to proactively monitor and intervene to help teams that are struggling. Suggesting that teams set up internal deadlines may provide a means for keeping students accountable and positively influence their experience working collaboratively by minimizing differences in study habits, which may help a deadline-oriented person to complete work in advance and an early-bird person to be patient and trust that others will complete their parts by the internal deadline.

### Instructor's Role

During the implementation of the design, the instructor chose not to proactively intervene when students had problems. The reason for not intervening was because one of the course objectives was "to utilize strategies that create movement within groups, to recognize when a group has stalled, and to develop and apply strategies that helps a group move through dysfunction." Thus, the instructor intentionally did not intervene in problematic situations because she wanted the students to find their own way to solve the challenges related to communications in small groups. The readings and class materials in the course included several strategies and methods of getting groups unstuck and suggestions for dealing with dysfunctional group members, which could be used as a resource by students when they had problems.

Unfortunately, with this hands-off approach, one team struggled and needed outside intervention to succeed. In hindsight, the authors realized they hadn't provided the

instructor suggestions for how to enact the collaboration strategy beyond the initial set-up activities. The second author uses several techniques in her courses to help students maintain positive collaborations experiences. First, she grades students using two rubrics: one for facilitators and the other for participants (Appendix B). Thus, students are held accountable for upholding their team norms and submitting their work on a timely basis. Second, in addition to writing reflections, students are asked to review their norms each week and make modifications to them to address any problems they had working together. For example, a team might establish a norm that frequent check-ins are required, but each team member might have different interpretations of what "frequent" means. So, the instructor of the course would prompt them to revise that norm to come up with a definition of frequency (e.g., daily, hourly, etc.). Third, for rare instances when teams cannot resolve their difficulties through this re-norming process, the second author intervenes by hosting a synchronous meeting to help the members find commonalities and build off one another's strengths. These enactment strategies were added to the instructional website for future implementations.

As a result of this design case, the authors learned that the collaborative strategy does not stand alone as a design artifact. In order to use this strategy, the instructor must possess and apply certain skills and abilities.

- The course instructor should be able to explain clearly why collaborative activities are required for the course and how they contribute to learning to alleviate students' concerns.
- The course instructor should possess excellent time management skills because the collaborative strategy requires students to post regularly and this needs to be monitored frequently. Sending reminders to the students who have not completed the assignments or requirements is essential.
- The steps of the collaborative strategy are interconnected, and the set up must occur during the first two weeks of the class in order to get the teams functioning quickly. Thus, the course instructor should be prepared for additional preparation time required to analyze the survey responses, students' introductions, and their posting patterns in order to assign students to groups.
- The course instructor should also carefully monitor the groups to see if the groups are functioning well and intervene as needed.

## REFLECTION

In comparison with her previous teaching experiences with groups, the instructor found the collaborative strategy useful in assigning students to groups. In addition, she found it created several opportunities for students to build and maintain teams.

In comparison with her previous teaching experiences with groups, the instructor reported her satisfaction with the collaborative strategy and expressed her willingness to continue using it. She was particularly satisfied with being able to group students based on their schedule preferences. Previously she had experienced challenges when students could not find a mutually agreeable time to work together or when students were taking the course in different time zones. In addition, the instructor noted that she received several compliments from the students, either in reflections or private emails, expressing that it was the best group experience they had. For example, one student commented:

> I had serious reservations about this course. I was not excited about having to do team assignments through the entire semester. However, this exceeded my expectations. My group was very pleasant to work. I believe I was lucky to get placed on a team where we all had a shared interest to turn in assignment in plenty early and receive good grades.

In summary, the grouping strategy was not able to capture all of the complexities of the students' personalities. The designers of the course agreed that in future iterations, it might be more useful if the "what stumps me" activity had been carried out before the groups were composed because students' responses in the activity may provide additional information useful in assigning students to teams. In addition, as mentioned above, the authors realized they hadn't provided the instructor suggestions for how to enact the collaboration strategy beyond the initial set-up activities. Related enactment strategies were added to the instructional website for future implementations. Although minor enhancements can be made, the collaborative strategy was generally a positive experience for both the instructor and students.

## REFERENCES

Broadbent, J., & Poon, W. L. (2015). Self-regulated learning strategies & academic achievement in online higher education learning environments: A systematic review. *The Internet and Higher Education, 27*, 1-13.

http://dieoi.org/10.1016/j.iheduc.2015.04.007

Carson, J. B., Tesluk, P. E., & Marrone, J. A. (2007). Shared leadership in teams: An investigation of antecedent conditions and performance. *Academy of Management Journal, 50*(5), 1217-1234. https://doi.org/10.2307/20159921

Chapman, K. J. M. Meuter, D. Toy, & L. Wright (2006). Can't we pick our own groups? The influence of group selection method on group dynamics and outcomes. *Journal of Management Education, 30*(4), 557-569. https://doi.org/10.1177/1052562905284872

Cohen, E.G. (1994) Restructuring the classroom: Conditions for productive small groups, *Review of Educational Research, 64*, 1-35. https://doi.org/10.3102/00346543064001001

Dillenbourg, P. (1999). What do you mean by collaborative learning? In P. Dillenbourg (Eds.), *Collaborative-learning: Cognitive and computational approaches* (pp. 1–19). Oxford: Elsevier.

Ergulec (2017). *Students' Collaboration Experiences of a Purposeful Group Assignment Strategy and Team Building in an Online Graduate Class.* (Doctoral dissertation). Retrieved from ProQuest Dissertations and Theses database. (UMI No. 10604243)

Feichtner, S.B. & Davis, E.A. (1984). Why some groups fail: A survey of students' experiences with learning groups. *Journal of Management Education*, *9*(4), 58-73. https://doi.org/10.1177/105256298400900409

Forsyth, D. R. (2010). *Group dynamics* (5th ed.). Belmont, CA: Wadsworth Cengage Learning.

Haythornthwaite, C. (2008). Learning relations and networks in web-based communities. *International Journal of Web Based Communities*, *4*(2), 140-158. https://doi.org/10.1504/IJWBC.2008.017669

Hüffmeier, J., & Hertel, G. (2011). When the whole is more than the sum of its parts: Group motivation gains in the wild. *Journal of Experimental Social Psychology, 47*(2), 455-459. https://doi.org/10.1016/j.jesp.2010.12.004

Johnson, D. W., Johnson, R. T., & Smith, K. (2007). The state of cooperative learning in postsecondary and professional settings. *Educational Psychology Review, 19*(1), 15-29. https://doi.org/10.1007/s10648-006-9038-8

Johnson, D. W., Johnson, R. T., & Holubec, E. J. (1994). *The nuts and bolts of cooperative learning*. Edina, MN: Interaction Book Company.

Kerr, M. S., Rynearson, K., & Kerr, M. C. (2006). Student characteristics for online learning success. *The Internet and Higher Education*, *9*(2), 91-105. https://doi.org/10.1016/j.iheduc.2006.03.002

Kichuk, S. L., & Wiesner, W. H. (1997). The big five personality factors and team performance: Implications for selecting successful product design teams. *Journal of Engineering and Technology Management, 14*(3), 195–221. https://doi.org/10.1016/S0923-4748(97)00010-6

McDonald, J. P., Zydney, J. M., Dichter, A., & McDonald, E. C. (2012). *Going online with protocols: New tools for teaching and learning.* New York, NY: Teachers College Press.

Michinov, N., Brunot, S., Le Bohec, O., Juhel, J., & Delaval, M. (2011). Procrastination, participation, and performance in online learning environments. *Computers & Education*, *56*(1), 243-252. https://doi.org/10.1016/j.compedu.2010.07.025Oakley, B. A., Felder, R. M.,

Brent, R., & Elhajj, I. (2004). Turning student groups into effective teams. *Journal of Student Centered Learning*, *2*(1), 9–34. Retrieved from: http://owww.brookes.ac.uk/services/ocsld/group_work/turnin_student_groups_into_effective_teams.pdf

Palloff, R. M. & Pratt, K. (2013). *Lessons from the Virtual Classroom* (2nd Ed). San Francisco, CA: Jossey-Bass.

Rakes, G. C., & Dunn, K. E. (2010). The impact of online graduate students' motivation and self-regulation on academic procrastination. *Journal of Interactive Online Learning*, *9*(1), 78-93. Retrieved from http://www.anitacrawley.net/Articles/Rakes%20self%20reg%20and%20procrastination.pdf

Roberts, T. S., & McInnerney, J. M. (2007). Seven problems of online group learning (and their solutions). *Journal Educational Technology & Society, 10*(4), 257-268. Retrieved from: http://www.ifets.info/journals/10_4/22.pdf

Sabry, K., & Baldwin, L. (2003). Web-based learning interaction and learning styles. *British Journal of Educational Technology*, *34*(4), 443–454. https://doi.org/10.1111/1467-8535.00341

Sahin, Y. G. (2011). A team building model for software engineering courses term projects. *Computers & Education, 56*(3), 916–922. https://doi.org/10.1016/j.compedu.2010.11.006

Smith, K. M. (2010). Producing the rigorous design case. *International Journal of Designs for Learning, 1*(1), 9-20. Retrieved from: https://scholarworks.iu.edu/journals/index.php/ijdl/article/view/917

Smith, G.G., Sorensen, C., Gump, A., Heindel, A.J., Caris, M., & Martinez, C.D. (2011). Overcoming student resistance to group work: Online versus face-to-face. *The Internet and Higher Education, 14*(2), 121-128. https://doi.org/10.1016/j.iheduc.2010.09.005

You, J. W. (2015). Examining the effect of academic procrastination on achievement using lms data in e-learning. *Journal of Educational Technology & Society, 18*(3), 64-74. Retrieved from: http://www.jstor.org/stable/jeductechsoci.18.3.64

Zydney, J. M. (2013). *Course material from CI 8072, Learning Sciences and Technology, Spring 2013 semester.* Cincinnati, OH: University of Cincinnati.

Zydney, J. M. (2015). *Course material from CI 8072, Learning Sciences and Technology, Spring 2015 semester.* Cincinnati, OH: University of Cincinnati.

**Study Habit Questionnaire**

This is a survey that will help us put people together into groups. The scale is from 0 to 5 where 0 is not at all typical of you and 5 is very typical of you. Please be as honest as possible when answering these questions.

\* Required

**What is your first and last name? \***

**I tend to hand things in right before the deadline. \***

1 2 3 4 5

Not typical of me          Very typical of me

**I am very detailed oriented and catch most mistakes before handing something in. \***

1 2 3 4 5

Not typical of me          Very typical of me

**When in a group, I tend to initiate tasks and get things started. \***

1 2 3 4 5

Not typical of me          Very typical of me

**When in a group, I tend to take on extra tasks that no one is doing. \***

1 2 3 4 5

Not typical of me          Very typical of me

**When in a group, I am good at delegating tasks so that the work is evenly distributed. \***

1 2 3 4 5

Not typical of me          Very typical of me

**I like to get started on things right away. \***

1 2 3 4 5

Not typical of me          Very typical of me

**I am comfortable with learning new technologies on my own. \***

1 2 3 4 5

Not typical of me          Very typical of me

**I would consider myself very organized and like to plan things out ahead of time. \***

1 2 3 4 5

Not typical of me          Very typical of me

**When do you like to get work done for class? \***

- In the evenings during week days
- during the daytime during week days
- very late at night during week days
- on the weekend during the day
- on the weekend in the evening
- on the weekend late at night

**What time zone are you located in? \***

- Eastern
- Central
- Mountain
- Pacific

**How many hours per week do you dedicate towards your graduate studies? \***

- 0 - 5 hours
- 5 - 10 hours
- 10 - 15 hours
- 15 - 20 hours
- Other:

**How many courses are you taking this semester? \***

- 1 course
- 2 courses
- 3 courses
- 4 courses
- Other:

**Add any other comments if you can think of anything else that would be helpful for us to know in creating teams (e.g., specific people you would like to work with).**

# APPENDIX B

### Facilitator Rubric and Team member Rubric

## Facilitator Rubric

| | Needs Improvement | Competent | Proficient |
|---|---|---|---|
| **Initiation** | **0** (0%) Does not set up shared documents or start discussion prompts | **4** (10%) Sets up shared documents and/or starts discussion prompts late | **8** (20%) Sets up shared documents and/or starts discussion prompts at the start of the module |
| **Delegation** | **0** (0%) Completes the group project by him/herself. | **4** (10%) Unevenly distributes tasks among group members | **8** (20%) Delegates work so that everyone has a fair share |
| **Closure** | **0** (0%) Does not synthesize group member's work. | **4** (10%) Minimally synthesizes everyone's work, so the group project lacks cohesiveness and looks like several people did the work | **8** (20%) Synthesizes everyone's work into a coherent final project |
| **Timeliness** | **0** (0%) Submits project late | **4** (10%) Submits project on time, but work is hurried and done last minute | **8** (20%) Establishes smaller deadlines and ensures that group project is submitted on time |
| **Group Norms** | **0** (0%) Does not help group to maintain norms. | **4** (10%) Forgets to send reminders, but corrects members who fail to follow group norms | **8** (20%) Sends friendly reminders to group to maintain norms established |

## Team Member Rubric

| | | | |
|---|---|---|---|
| **Teamwork** | **0** (0%) Team member does not participate | **5** (5%) Team member is an adequate member of the team, meeting 1 or 2 of the team criteria. | **10** (10%) Team member is a productive member of the team, meeting the following criteria: a) does his or her fair share of the work, b) reviews other member's work, and c) upholds team's established norms. |
| **Timeliness** | **0** (0%) Team member does meet any of the deadlines. | **5** (5%) Team member meets some of the deadlines, potentially causing group project to not make final deadline. | **10** (10%) Team member meets all interim deadlines and helps to ensure group project meets the final deadline. |