Effective Teamwork

Educational Goals, Instruction, and Assessment

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1: Context & Initial Resources

Context for your Educational Design:

Who will you teach? Age range? Experience level? Relationship to you?

I will teach Carnegie Mellon undergraduate students. I expect their ages to range from 17 (youngest) to 23 (oldest). They will likely have a significant amount of experience working in groups, but very little formal instruction on the topic. Some students might have experience with team-building activities from extracurricular activities or sports, but I expect that few will have had targeted instruction on small-group work (in academic or work contexts). I expect that students will have varied academic backgrounds.

Since students will be my peers, it will be challenging to create a productive course climate. As several reviewers of this curriculum noted, it is "hard to teach with warmth and charm!" and it will be challenging to "avoid sounding conceited" when teaching my peers. I will try to address these challenges by:

- Asking students to share what their experiences and what they know already—acknowledging their prior knowledge and using it as part of the course
- Being clear to students that I am not perfect in regards to teamwork skills and giving examples of mistakes I've learned from in the past
- Being careful to give plenty of praise as well as constructive criticism
- Incorporate humor into my teaching by using fun examples for course concepts (i.e., scenes from TV or movies)

In what domain have you or other educators noted learning challenges, and which of them will your project target?

I have noted that students struggle to work effectively in small groups. By college, most students have significant experience working in groups for academic or extracurricular projects, but very few students have what I would call expertise in group. Traditional classes and activities generally take the "sink-or-swim" approach to group work—assigning groups, maybe even grading on teamwork, but never addressing the actual skills involved in group work or giving opportunities for practice and feedback.

What knowledge, skills, and dispositions are central to what you plan to teach?

In terms of knowledge, I want to teach what common pitfalls are in group work and how to overcome them. Skills-wise, I hope to build students' abilities to communicate effectively, to resolve conflicts well, to handle logistical constraints creatively, and to be both good group leaders and group members. In terms of dispositions, I want students to learn to be positive about working in groups, confident that by working with others they can accomplish more than they would alone.

Why is it important for them to learn what you plan to teach? Remember our priorities for transfer goals and real life connections.

Targeting skills for working in small groups is very important to students' future success. In school, at work, for other projects, being able to work effectively in a group is essential to success. What students learn about group work will transfer to the group work they do in class. Collaboration skills will also make students more effective in the working world, and many employers use criteria like "works well in teams" to recruit and hire employees.

Where will you teach them? In school or another learning environment? In what subject area within school?

Since I plan to teach this class as a student-taught course, location is flexible. It's probably that I will teach the class in a classroom or conference room in an academic building. Depending on what form the actual projects that groups in the class are doing, class could move to other locations. The class would not fall into a traditional academic subject area, but it does deal with a class of skills that schools would like students to have.

When will you teach them? Time of year? Anticipated length of instructional sequence? Estimated total time of lessons?

I will teach the students during the course of one semester, roughly four months. The course will be during the fall or spring semester. The class will probably meet once a week, which is normal for student-taught courses. Classes will last about 2 ½ hours, and any out of class work will not be very time consuming. Since there are approximately 15 weeks in a semester, which means that there will be fifteen 2 ½ hour sessions, or about 37.5 hours of class time.

Initial Resources Available:

How much experience do you have in the project domain? As a student? As a teacher? How much reading have you done about education in this area? List a few of the best articles.

I am not an expert in the domain of teamwork. Still, I have experience working in groups for a variety of academic and nonacademic projects. Call it "experiential learning". I've also been involved in activities designed to teach leadership skills, which are a component of group work. Though I still lack domain expertise, I have gained a significant amount of content knowledge in developing this curriculum, so I am familiar with the theory of group dynamics that underlies the skills I am teaching.

As a teacher, I have never formally taught group work specifically. I have "taught" some aspects of working with others as a camp counselor, but my experience in this domain is not extensive.

I have read a large number of papers in this area since beginning the project. Some of the ones I have found most helpful are listed below alphabetically.

- Bolton, M. K. (1999). The Role Of Coaching in Student Teams: A "Just-in-Time" Approach To Learning. Journal of Management Education, 23(3), 233-250. doi:10.1177/105256299902300302

- Chen, G., & Klimoski, R. J. (2004). Training Undergraduates to Work in Organizational Teams Georgia Institute of Technology. Management Learning, 3(1), 27- 40.
- Lancellotti, M. P., & Boyd, T. (2008). The Effects of Team Personality Awareness Exercises on Team Satisfaction and Performance: The Context of Marketing Course Projects. Journal of Marketing Education, 30(3), 244-254. doi:10.1177/0273475308322282
- Marotta, S. A., Peters, B. J., & Paliokas, K. L. (2000). Teaching Group Dynamics: An Interdisciplinary Model. Journal for Specialists in Group Work, 25 n1 p16-(1), 16-28. doi:10.1080/01933920008411449
- Rousseau, V. (2006). Teamwork Behaviors: A Review and an Integration of Frameworks. Small Group Research, 37(5), 540-570. doi:10.1177/1046496406293125
- Seat, E., & Lord, S. M. (n.d.). Enabling Effective Engineering Teams: A Program for Teaching Interaction Skills Interacting is a learned skill. Education.
- Stevens, M. (1994). The knowledge, skill, and ability requirements for teamwork: Implications for human resource management. Journal of Management. Retrieved from http://www.sciencedirect.com/science/article/pii/0149206394900256
- Working Together: Personal Skills for Productive Teams. Michigan Leadership Initiative.

I have read a few books about my domain. I skimmed the textbook Communicating at Work and a "student guide" called Successful Teamwork. I found Successful Teamwork to be more helpful and suitable for my course, since it focuses more on practice than theory. In addition, I read the book The Five Dysfunctions of a Team, which seemed to be written primarily for business managers, but helped me to develop my own understanding of the domain. I might use excerpts from the book for in class case studies.

I also read about half of The Pfeiffer Book of Successful Team-Building Tools, a reputable collection of team-building exercises. While I might modify some of the exercises to use in the course, most of them were not very authentic tasks and did not seem to align with the stated goals.

Do you know how this domain fits with the educational standards specified for the learners you intend to teach? If so, briefly describe them.

Carnegie Mellon does not have explicit standards for students' ability to work in groups, though it does have an institutional goal to "promote interdisciplinary research on the effective use of teams in organizations".

Additionally, the well-known professor Randy Pausch published his guidelines for group work in the Building Virtual Worlds course on his own website. The guidelines are mostly practical advice about how to interact in groups—they don't really take the form of traditional educational standards. Still, I may incorporate them into my instruction or assessment. I think one particularly important step will be to ask students to keep those guidelines in mind while actually engaging in group work, then to have them reflect afterwards on how well they followed the guidelines.

I found a rubric for assessment of group work skills created by the Human-Computer Interaction Institute for applicants to its Accelerated Master's program. While I may incorporate

it into the assessments I use for my class, I don't think it is easily translatable into goals for my class.

Finally, in a page giving advice to Carnegie Mellon professors who are having trouble with group projects, the Eberly Center lists "the ability to work with others to assess the nature of the task, break it down into steps or stages, plan a strategy, share responsibilities, manage time, set and meet deadlines, communicate effectively, and resolve disagreements or conflicts if they arise" as process-related skills for group work. Though I found these relatively late in my course design process, I think they align very well with what I plan to teach.

Is there an educator in this area who can serve as a consultant to help you identify your target goals and the learning challenges in this domain, as well as reviewing your project design as it progresses?

I spoke to Laurie Weingart, the director of the Center for Interdisciplinary Research on Teams (CIRT) at the Tepper School of Business, about my course design relatively late in the process—just after the Instructional Design stage of the process. Her most helpful advice addressed the activities to use for instruction. She suggested that rather than giving the course a theme, I try to use activities with diverse, realistic contexts.

I also spoke to Dr. Robert Kraut, who teaches the course "Organizational Communication" for the Tepper School of Business about advice on target goals and learning challenges. His course covers both theory and some practice for group dynamics. I asked him what challenges he thinks students have when working groups (he said social loafing was probably the most challenging). With regards to goals, he said he wanted students to be able to apply theories they learned to understand their group interactions. However, when I asked if he thought students who had taken the course actually improved in their ability to work well in groups, he said he couldn't tell; he does not assess that ability directly.

Are you aware of any educational materials (instruction and/or assessment) that have already been designed to teach this domain? List them here, along with your opinion of their quality.

(Almost) Full List: http://www.diigo.com/user/julialt/EGIA

Assessment Materials

- CMU HCII Accelerated Masters Group Work/Interpersonal Evaluation http://www.hcii.cmu.edu/files/hcii-files/Application-AcceleratedMasters.pdf
    - more summative than formative
        - not specific enough to provide useful feedback
    - good as a reference for specific behaviors to look for when working in groups, but poor as a measure of metacognitive aspects
- Michigan Engineering, Group Work http://www.engin.umich.edu/teaching/assess_and_improve/handbook/direct/teamwork.html
    - this links to papers about assessment methods, but doesn't provide any actual assessment materials

- NDT "Teamwork in the Classroom"
  http://www.ndt-ed.org/TeachingResources/ClassroomTips/Teamwork.htm
    - This page has a table comparing groups vs. team behaviors. It could be very useful to construct a rubric for students to evaluate teams as a whole.

Instructional Materials

- Syllabus for Course in Leadership and Group Dynamics at Michigan State University
  https://www.msu.edu/~gwittenb/syll340.pdf
    - not focused on application of material
- Information on Group work from Speaking in the Disciplines at UPitt
  http://www.speaking.pitt.edu/student/groups/index.html
    - great information, concise, would potentially use in course
    - application-focused
- Syllabus for Organizational Communication Course at CMU
  http://www.cs.cmu.edu/~kraut/orgcomm/
    - lots of reading on the topic, useful for knowledge/content
    - not very activity based
    - Dr. Kraut will let me borrow materials (i.e. books, articles) if I ask
- Syllabus for Group Dynamics class at University of Oregon
  http://www.ingroup.net/ArrowPsy457.pdf
    - more application focused, but not detailed enough to be very helpful
- *Communicating at Work: Principles and Practices for Business and the Professions*
    - Read parts of this, but it's much more focused on theory than skills.
- Group Dynamics activities
  http://www.has.vcu.edu/group/acts.htm
    - some more applicable than others
- Extensive Site on Group Dynamics from University of Richmond
  https://facultystaff.richmond.edu/~dforsyth/gd/
    - many resources, more content than activities, but seems very helpful
- Small Group Communication
  http://www.pitt.edu/~groups/main2.htm
    - materials from UPitt about small group communication, not focused on application/teaching good communication, but could still be helpful
- Colorado State University Group Work Site
  http://writing.colostate.edu/guides/processes/group/list8.cfm
    - focused on students (vs. academic interest/researchers/teachers)
- Group Work
  http://tep.uoregon.edu/resources/newteach/groupwork.html#explain
    - advice for teachers about teaching group work

2: Anticipated Learner Profile [Revised]

Initial Expectations

Developmental Level

My students will be undergraduate students at Carnegie Mellon University. I expect that their ages will fall within the range of 17-23 years old. Basically, college age young adults. According to How Learning Works, college is a time when students experience significant social and emotional development. The book cites the Chickering model for developmental changes that students experience during the college years. The dimensions of the model are:

- developing competence (intellectual, physical, interpersonal)
- managing emotions and expressing them appropriately
- developing autonomy
- establishing identity
- freeing interpersonal relationships (awareness of differences among people and tolerance of those differences)
- developing purpose
- developing integrity (balancing self-interest and social responsibility)

Since college is a time of rapid development in all these areas, I expect that one challenge may be different levels of development in my students. For example, a senior that enrolled in my course would likely have a much more developed sense of autonomy and purpose than a freshman. In general, I expect the above dimensions of development to have a significant impact on my course. In particular, students who have more developed abilities for managing and expressing emotions, tolerance for others, and integrity will likely have more aptitude for group work. Chickering's developmental changes overlap with skills and dispositions that I want students to develop. Basically, their developmental level will determine their "prior knowledge" for certain skills. So, I believe I will be able to expect more from students who are further along this developmental spectrum. The subject of group work is closely related to dimensions like managing and expressing emotions, tolerating differences, and balancing self-interest and responsibility.

As young adults, I expect that my students will have some learning predispositions similar to those of adults. They will want to be able to see the relevance of what they are learning and know how to apply it practically to their own lives. Also, especially since my students will be my peers, they will need to be shown respect and treated as equals.

My students will be CMU undergraduates, so they likely have a significant capacity to process information and learn. I expect that most will have some basic metacognitive abilities (especially older students), but based on my own observations of my peers, I doubt that the students will be metacognitive "experts". I think students will have the ability to meaningfully plan and reflect, but not necessarily the disposition to do so.

My students' physical development will not likely be relevant for my course. Differences in social development, however, will be very important. Students who are better at establishing and maintaining relationships with others will naturally be better at doing so in the context of group work. I expect a wide degree of variation in my students' level of social development, based on both differences in age and experience.

Knowledge Base

My students will likely have some pre-existing knowledge, skills, and dispositions related to the domain. In terms of knowledge, I think students may have some background knowledge about teamwork (i.e., from extracurriculars and sports), but little formal knowledge about group dynamics. Students with background knowledge in social psychology may have related knowledge about group behavior, though not specifically about group work.

I expect that most students will have some basic logistical organization skills. This will likely vary from student to student, but I think my students will have had experience organizing meetings and planning collaborative projects. However, they may not have a structured or well-thought out procedures for doing so, since most of their skills will likely results from hands-on past experience.

For communication and conflict resolution skills, I expect a great deal of variation in students' existing skills. Generally, I think students will have good communication skills but might not apply those skills appropriately in the context of group work. As for conflict-resolution, I think my students will have weaker skills overall in that area. The main reason I believe this is because my students will still be developing tolerance for others and emotional control, both of which contribute to conflict resolution skills. I doubt that my students will have skills in using more formal strategies for conflict resolution, simply because they are rarely taught explicitly.

Regarding dispositions, I expect that most of my students will dislike group work, especially in academic contexts. Problems like social loafing seem omnipresent in academic projects, and experiencing such problems without guidance on how to resolve them will likely have given students negative attitudes toward group work. I specify that students will dislike group work in academic contexts especially because in other contexts (e.g., extracurriculars or sports), members of a group usually have a choice to participate in the group and a shared interest or valued goal. Since nonacademic contexts give individuals choice and motivation to engage in group work, common group work problems might be less prevalent/severe, so students might have a more positive attitude toward group work in those contexts.

I think that students' developing interpersonal skills could provide a helpful foundation for building communication skills in groups. However, I think a possible misconception is that communication strategies used with friends are completely transferable to group work. For instance, though it is important for a group to get to know each other, some personal information should not necessarily be shared in the context of a team working on a project.

Misconceptions

Other possible misconceptions include beliefs about how groups have to work together. For example, some students may think that division of labor is always the most effective way to do

work. Others might have the disposition that they cannot affect the way their groups function if they are not the leader (or even if they are). Another misconception I may need to address is the difference between leading a group effectively and being an effective group member. Many CMU students are used to taking on leadership roles and think that to be effective in a group, they need to be in charge.

Cultural Differences

Cultural differences will affect students' prior knowledge in terms of content and their expectations about my course.

Students from cultures that put a greater emphasis on group collaboration might actually have an advantage in my course. However, those same students might struggle in some of the communication skills I plan to teach. For instance, students from cultures where communication tends to be indirect may struggle to explicitly give other students feedback about their behavior. Similarly, such students might struggle to accept the idea that a group member should share information about their progress on a task, even when that means not meeting others' expectations.

Cultural differences will also affect students' expectations for my course. According to "Recognizing and Addressing Cultural Variations in the Classroom", a document published by the Eberly center for Carnegie Mellon professors, many international students have different expectations about:

- the role of the teacher
- asking questions
- degree of formality in classroom
- participation in discussions
- communication style

I believe that, while cultural differences will influence my course, they may not be as much of a problem for my course as for more traditional academic courses. Because my course is unusual in format and content, I will have to be very explicit about my role as a peer and a teacher, about the degree of formality, participation in discussions, etc. for all students, not only international students.

Individual Differences

Intrinsic individual differences will affect students in my course. Students' interests could affect their level of prior knowledge. It may also affect their motivation to learn certain material for the course. However, as a Stu-co, my course is voluntary, so students presumably will have some interest in group work if they enroll.

Neurodevelopmental

I expect that students with stronger neurodevelopmental social thinking systems will be more adept at the conflict resolution and communication portions of the course. Students with strong sequential ordering and attention control systems will likely have an advantage in the logistical planning and organization part of the course.

Temperament

Many of the skills on the BarOn EQ-I scale are relevant to effectively working in groups. Overall, I expect that students with greater interpersonal intelligence will likely excel at communication and leadership within a group. Empathy would allow them to listen and speak to others in an appropriate way. Students with a strong sense of social responsibility will likely be good at fostering cooperation. Students with strong stress management and adaptability will likely be more proficient at conflict resolution. A greater ability to manage and control emotions would allow such students to remain calm when conflict arises. Similarly, greater adaptability—comprised of reality-testing, flexibility, and problem-solving, would also be very helpful during negotiation and conflict resolution.

Abilities

Similarly, students with greater interpersonal intelligence will likely be better at the social aspects of group work. Students with high intra-personal intelligence may show advantages in metacognition and reflection about their experiences. Logical-Mathematical thinkers might be more adept at reasoning deductively about guidelines for group behavior and applying them to individual situations. Logical mathematical thinkers may also be more adept at using tools to plan logistics for group work.

Expectations for Change:

I expect each of my students to improve on their ability level to work in a group. I want all of my students to meet the goals for the course. Most of the goals should be attainable for most students. One area where students may not all get to the same level is the area of cognitive skills like communicating effectively and planning effectively. Those take a great deal of practice, and how far students' progress will depend on their baseline aptitudes and experiences. However, I think that most students should be able to achieve the goals I have set.

My focus for this course is not perfecting students' skills, but more giving them knowledge, strategies, and dispositions that will allow them to be more effective at group work in the future and continually improve their skills through metacognitive assessment, reflection, and planning.

Note about Format:

K/S/D is by color: **Knowledge** **Skills** **Dispositions**

Cognitive/Metacognitive is coded like so:

cognitive goal
metacognitive goal

Top-Level View of Goals

Interpersonal

These goals focus more on students' ability to interact with each other—communicating with one another and resolving conflicts.

Interpersonal Skills and Communication

1. Establish positive working relationships with their teammates.
2. Communicate effectively with teammates.
3. Facilitate communication within the group.
4. Organize logistics of communication and information sharing/collaboration.

Conflict Resolution

5. Engage in productive conflict and avoid unproductive conflict. .
6. Negotiate effectively.
7. Mediate conflicts within the group.

Process

These goals focus on students' ability to plan and coordinate a team project, doing things like making rules, planning deadlines, and defining and dividing tasks.

Planning

8. Create ground rules at the beginning of a project.
9. Make plans to organize project.
10. Coordinate work with teammates.
11. Transparently discuss workload sharing with group.

Collaborative Work/Meetings

12. Facilitate and participate in collaborative problem solving.
13. Use time in group meetings effectively.

Overarching

These goals are the most abstract, mainly dealing with students' attitudes and metacognition.

Accountability

14. Reliably complete work for which they are responsible.
15. Focus on results/goals.
16. *Hold self and others to high standards.*
17. Prioritize interests of the team over own interests.
18. *Take initiative to help team reach goals.*

Metacognitive Goals

19. *Think reflectively about group work in real life.*
20. *Identify own strengths and weaknesses in group work.*
21. *Think about how to handle own weaknesses in group work.*

3: Learning Goal Specifications [Revised]

Note about Format:

K/S/D is by color: **Knowledge** **Skills** **Dispositions**

Cognitive/Metacognitive is coded like so:

cognitive goal
metacognitive goal

Interpersonal Skills and Communication

1. Establish positive working relationships with their teammates.
    1.1. Know to take time to get to know people at the beginning of a project.
        - Meet teammates as people; get a sense of their situation and context.
    1.2. Know behaviors/attitudes that contribute to good team atmosphere.
        - Friendly, Considerate, Concerned, Compassionate, Congratulatory
    1.3. Promote open communication and help seeking.
        - Encouraging others to say when they can't do something, right away.
        - Making it clear that honesty is the most valuable thing, even if it means being honest about a problem (e.g., likely missing a deadline).
        - Always trying to help other group members.
            - To learn, not just doing their work for them.
    1.4. Trust teammates.
        - Do not do work that someone else has been assigned (unless the reassignment has been agreed upon by the group).
        - Speak honestly.
    1.5. Respect and appreciate individual differences between group members.
        1.5.1. Express appreciation for others' contributions.

2. Communicate effectively with teammates.
    2.1. Be a good listener.
        2.1.1. Listen well.
        - Let people finish
        - Listen nonevaluatively
        - Encourage speaker to elaborate, provide additional information, clarify
        - Repeat back message as they heard it
            - to show that they were listening and check that they understood
        2.1.2. Send nonverbal signals that show they are listening.
        - eye contact
        - nodding
        - not fidgeting
        - not making disapproving faces
        2.1.3. Work to understand others' perspectives.
        - Ask for reasons why others believe what they do.
        - Get to know others so you know where they are coming from.

2.2. Speak in a clear way that supports collaboration.

2.2.1. Know characteristics of effective communication.

- explicit/transparent
- ongoing
- honest
- goal-oriented
- open/supportive

2.3. Monitor listeners' reactions to what they are saying and adjust in response.

2.3.1. Reflect on characteristics of their own communication.

- Examine behaviors from others' perspective.

3. Facilitate communication within the group.

3.1. Monitor communications between group members.

- Notices who is speaking, who is listening, who seems engaged, who doesn't.
- Notices what is being said, whether it is effective or ineffective communication. (see 2.21, "Know characteristics of effective communication"

3.1.1. Recognize and interpret nonverbal communications of others.

3.1.1.1. Know major types of nonverbal communication.

- How they speak (e.g., pitch, rate)
- Facial expressions, gestures, postures.

3.2. Act to make communication in group more effective.

3.2.1. Know ways to facilitate communication between team members.

- Ask questions to clarify what is being said
- Ask for others' opinions.
- Give honest, constructive feedback on others' ideas.
- Express opinion honestly and tactfully.
- Offer their own ideas.
- Ensure that ideas are connected / discussion is coherent.
- Work to make sure all team members are engaged in discussion. .
    - ask for specific individuals' opinions.
        - e.g. "Joe, I know you know about ----, what do you think of ----?"
- Encourage others to communicate in an open and supportive way.

3.2.2. Willing and able to give constructive criticism to other group members.

- Willing to say, for example, "I know you have a lot of great ideas Joe, but I think that when you start getting excited and listing all of them, it intimidates everyone else and they don't say what they're thinking."

3.2.3. Transparent about their communication style.

- e.g. "I know I don't say much, but I am listening. I promise I'll talk when I have something to say."

3.2.4. Seek and use constructive criticism to improve their communication.

- e.g., "I know sometimes I talk too quickly. If I get going too quick, just interrupt and let me know, and I'll slow down."

4. Organize logistics of communication and information sharing/collaboration.

4.1. Recognize that there are many possible ways to communicate with a group.

- face-to-face as a group, face-to-face individually, email, video chat, shared whiteboard in a given location, word-of-mouth, phone (calls and texting)

4.1.1. Knows what technology tools exist for communication and collaboration.

- Email, chat, Skype
- Google Docs, Google Calendar
- Dropbox and other cloud sharing services
- Facebook and social networking
- Project management software

4.2. Judge which communication medium to used based on context.

- what group members are comfortable with
- what makes the most sense for the message
    - i.e., some issues should not be addressed via email or text; not every message has to be handled face-to-face
- what helps with progress toward objective most
    - i.e., face-to-face may be preferable, but if location's a problem, video chat can work too (can combine them as well)

4.2.1. Understand advantages and disadvantages of different technology tools for managing and information sharing.

- Disadvantage for all tech tools: Learning curve if people don't already use it.
- Google Docs Advantages:
    - Simultaneous Editing, Good Version Control, Nice Commenting System, Can Control Level Of Access Easily
- Google Docs Disadvantages:
    - Conflicts, Discomfort of Group Members, Misunderstandings While Editing
- Dropbox Advantages
    - Good for sharing files, Keeps backups, Tends to avoid versioning/branching issues, Good for any file type, Allows people to edit files normally (i.e. with Microsoft Word rather than Google Docs)
- Dropbox Disadvantages
    - Everyone needs to install it on their computer, Not as good at version control as Google Docs, Better solutions may exist for different file types (i.e., version control systems specifically for code)
- Google Calendar Advantages:
    - Works well for scheduling if everyone has it, Makes sure everyone is working from a common calendar
- Google Calendar Disadvantages:
    - Works best when everyone has it, Doesn't support many different ways to look at a timeline
- Facebook Advantages
    - Most people already use it and check it regularly, group "walls" work well for communications, can set it up to send email notifications, good commenting system
- Facebook Disadvantages
    - Document/photo/file handling isn't great, not good for collaborative drafting, notifications settings can cause issues, most people haven't used it for school work
- Project Management Software Advantages
    - Custom made for this purpose, many additional features, integrated file sharing and communication, can create really nice timelines/plans, task management
- Project Management Software Disadvantages

- People are reluctant to sign up for a service for one project, learning curve, many to choose from and not all are equally useful/usable

Conflict Resolution

5. Engage in productive conflict and avoids unproductive conflict.

5.1. Differentiate between productive and unproductive conflict.

5.1.1. Know characteristics of productive conflict.

- Productive, issue-focused conflict.
  - Debate about issues.
  - Focused on progress toward goals.
  - Not personal.
  - Rational.

5.1.2. Know characteristics of unproductive conflict.

- Unproductive conflict.
  - Debate about people.
  - Personal, feelings get hurt.
  - Irrational

5.2. Treat productive conflict as an opportunity to reach the best solution to a problem.

5.2.1. Know benefits of productive conflict.

- Venting opinions.
- Communicating dissatisfaction.
- Fostering innovation.
- Stabilizing relationships (by resolving issues).
- Fostering innovation

5.3. Willing to abandon a conflict when they realize it is not productive.

6. Negotiate effectively.

6.1. Resolve conflict without damaging interpersonal relationships.

- Keep conflict issue focused.
- Avoid assigning ownership to positions or ideas.
  - e.g., not "If we do what Jane thinks we should …"—instead "If we have the event on campus…"
- Stay rational. Be polite.

6.2. Try to find common ground and win-win solutions.

- Can accept resolution to a problem that is not their own.
- Practices integrative bargaining: tries for win-win outcome.
- Defining situation in terms of commonalities, common goals.
  - e.g., "We both want to get students more involved in sports. The real question is whether x will really get people interested. Maybe if we try…?"

7. Mediate conflicts within the group.

7.1. Match conflict resolution strategies with types of conflict.

- Miscommunication → questioning and listening techniques.
- Situational conflict → rearranging situation, changing structure.
  - i.e., rotating assignment schedule for certain tasks

- Incompatible goals → generating and evaluating alternative solutions together, searching for common goals, developing sub-goals, persuasion.
- Differences in values/attitudes/beliefs → increasing openness, encouraging tolerance.

7.1.1. Distinguish sources of conflict.

- Misunderstandings/miscommunications.
- Structural or situational constraints.
- Incompatible goals.
- Differences in values/attitudes/beliefs.

7.1.2. Understand what might cause unproductive conflict.

- Distrust.
- Feeling that work is being split unfairly.
- Bickering (unproductive arguments).
- Buck passing (not taking responsibility).
- Feeling unappreciated.
- Lack of clear purpose/goal (re: motivation).
- Problematic behaviors:
  - Tangents in discussion.
  - Focusing too much unimportant details.
  - Power seeking.
  - Recognition seeking (beyond reasonable level).
  - Domination.
  - Clowning.
  - Denial/dishonesty.

Planning

8. Create ground rules at the beginning of a project.

- Expectations for meeting attendance, deadlines, interruptions, how communications will be handled.

8.1. Recognize importance of initial project planning.

8.2. Know planning steps that need to be completed before project begins.

- Introductions, breaking the ice.
- Discussing what members bring to the project: skills, interests, preferences in work areas.
- Determining overall objective or goal of the project.
- Deciding on meeting logistics:
  - Medium: In person or through technology.
  - How often.
  - Where.
  - How to distribute information related to meetings.
  - Times
  - How meeting minutes will work (if applicable)
- Getting group members' contact info
  - email, phone number, general availability times
- Deciding on rough timeline.

9. Make plans to organize project.

9.1. Plan timeline for a project.

9.1.1. Estimate time it will take for tasks to be accomplished.

- Based on prior experience.
- Based on expert opinion.

9.1.2. Understands that extra time is needed before deadlines in a group project.

- Procrastination is worse for groups. It's very hard to get everyone to meet at the last minute.
- Need time to combine and review everything.

10. Coordinate work with teammates.

10.1. Plan projects so that division of labor is fair and effective.

10.1.1. *Can judge when divide and conquer is effective.*

10.1.1.1. Know advantages and disadvantages of collaborative problem solving vs. divide and conquer strategies.

- Divide and conquer
  - When a task has logical, simpler subtasks.
  - When each member of the group has an area of expertise that matches a part of the task.
  - For tasks or decisions that must be made quickly.
- Collaborative problem solving
  - For problems with many possible solutions.
  - For early decisions that will affect everyone.

10.1.2. Understand how to coordinate group work processes efficiently.

- Organizes work so that people can work in parallel as much as possible.
- Plan so that interdependent tasks are timed well (avoiding waiting).
- Plan for communication about processes when multiple people are involved in a task.
  - e.g., how they will share updates

10.1.2.1. Know difference between serial and parallel processes.

- Parallel: people work on different things at the same time.
- Serial: people work on the same thing, one at a time.

10.1.2.2. Identify interdependent tasks.

10.1.3. Believe that with good planning, a group can accomplish more together than the sum of what all the individuals could do.

11. Transparently discuss workload sharing with group.

- Clarify roles, responsibilities, expectations.
- Be honest when you think some people are doing too much and some too little.

Collaborative Work/Meetings

12. Facilitate and participate in collaborative problem solving.

12.1. Know pitfalls of collaborative problem solving.

- Compromises that aren't the best solution.
- Inability to recognize better solutions.
- Groupthink
- Conformity
- Domination by a few members.

12.2. Avoid pitfalls to group problem solving.

- Separating idea generation from evaluation.

- All members prepare ahead to present ideas for solutions.
- Limiting criticism during idea generation phase.
- Encouraging productive conflict.
- Structure meetings to allow for all members to have a say.

13. Use time in group meetings effectively.

13.1. Monitor use of time in group meetings

- Notice when the group is getting stuck on a certain part of a meeting (e.g., reviewing past meetings, going over agenda, making a minor decision)
- Intervene to make sure time is used effectively.
    - e.g., "I know this is important, but we really need to make a decision about x today, so can we come back to it later?"

13.2. Help to keep team focused on goals.

- Notice when conversation is straying too far off topic.
- Contribute opinions.
- Summarize.
- Seek consensus.

13.3. Help people stay involved.

- Ask what quieter people think.
- Ask people about what they're thinking.
    - "Do you not want to say what you think or are you still thinking?"
- Ask questions.
- Clarify or elaborate on what has been said.
- Make sure louder people don't dominate.

13.4. Make decisions efficiently.

13.4.1. Know questions to consider when deciding how to make a decision.

- What type of decision? Does it call for creativity and info from various sources?
- How important is the decision?
- How much time is available?
- What are the personal relationships among members?

13.4.2. Know advantages and disadvantages of different ways of making decisions.

- Consensus (unanimous vote).
    - Get everyone's ideas and input.
    - Ideally, everyone is behind the decision once it's made.
    - Takes time.
    - Have to resolve conflicts between any who disagree.
- Majority vote.
    - Faster than consensus and fairer than minority decision
    - Can work well if everyone willing to accept decision
- Minority decision (a few people decide).
    - Faster.
    - Appropriate if only a few people have the expertise/information.
    - Don't have full group's commitment to decision.
    - Fewer voices, so not as good for problems that depend on idea generation and exploration of alternative solutions.
- Expert opinion.
    - Fast, but can still lead to a good decision.
    - Not everyone's behind it.

13.4.3. Know ways to resolve deadlock in decision making

- Reframe issue
- Consider alternatives
- Avoid issue if possible and come back to it later

Accountability

14. Reliably complete work for which they are responsible.
15. Focus on results/goals.
16. *Hold self and others to high standards.*
17. Prioritize interests of the team over own interests.
18. *Take initiative to help team reach goals.*

Broad Metacognitive Goals

19. *Think reflectively about group work in real life.*
20. *Identify own strengths and weaknesses in group work.*
21. *Think about how to handle own weaknesses in group work.*

Compatibility Check

Alignment with Standards

The goals I have defined align with existing standards for group work. The goals align with standards for group work at Carnegie Mellon in particular, as well as more generally defined standards.

Randy Pausch's tips for working successfully in a group include

- meet people properly
- find things you have in common
- let everyone talk
- check your egos at the door (discuss ideas)
- praise each other
- put it in writing
- for organizing meetings
- establishing accountability (who is responsible for what by when)
- sharing information between all group members
- be open and honest
- avoid conflict due to stress and tempers
- phrase alternatives as questions (encourage comments rather than defensiveness)

His advice about meeting people and finding things in common relate to interpersonal goals about building relationships and getting know the team. Letting everyone talk, praising others, and being open and honest align with my goals for effective, open, supportive communication. He differentiates between productive and unproductive conflict, encouraging a focus on ideas avoiding unproductive conflict. He also emphasizes accountability and clear communication between members by putting things in writing.

Though his standards focus on interpersonal relations more than organization and process, it makes sense given the context of the advice. His tips are for the Building Virtual Worlds course, which has defined roles for members (based on area of expertise) and timelines as a part of the projects that students do.

My goals also align with the other Carnegie Mellon group work standards I found—those for Masters Students at the HCII. Their standards focus on individual's contribution to a group, which I address in several sub goals: (e.g., the disposition to feel responsible for assigned work, skill of getting things done on time). The HCII standards also align with my goals for communication, in particular, for effective and pleasant interpersonal interaction, clear communication, and facilitation of conversation with others.

Outside CMU, my goals align with existing frameworks for group work. The goals align because they are based off those existing frameworks. For instance, many of my goals are derived from the Teamwork KSA created by Michael Stevens. Many employers use a test based on the Teamwork KSA to evaluate potential employees, so this alignment also suggests that my goals should align with the larger goal of making students more able to work in groups at work.

I also referred to the "Michigan Team System" in developing my goals. My goals align and overlap with their goals, which include:

- effective meetings
- building trust
- self-awareness
- accountability
- time management
- sharing information
- active listening

Additionally, while developing my goals, I referred to a research paper which reviewed and integrated all existing teamwork frameworks ("Teamwork Behaviors", Rousseau 2006). My goals seem to align with most existing frameworks and with their integrated framework.

Finally, my goals align with the skills that the Eberly Center lists as group work process skills:

- the ability to work with others to assess the nature of the task
- break it down into steps or stages
- plan a strategy
- share responsibilities
- manage time
- set and meet deadlines,
- communicate effectively
- resolve disagreements or conflicts if they arise

Alignment with Program

My class is not a part of a particular program at CMU, but I do believe that the goals for the course will align with learners' natural goals. One way in which my goals will connect to learners' goals is that many of my goals are socially-oriented. The ability to feel good about oneself and one's relationship with others is appealing, and that is something that my course is

trying to develop. I believe that the social aspects of my course will appeal to my learners' inclination as humans to value social ability.

I also think that I will be able to tap into learners' existing motivation by highlighting how teamwork skills will help them accomplish other goals they have, such as excelling in classes or getting a good job. Improved teamwork skills will help students achieve more in any context where they have to work together with others. Even in contexts that do not involve group work, skills such as planning and communication would be useful to learners. I can tap into learners natural motivation by asking them to apply component skills of teamwork (e.g., planning) to their everyday lives during the course.

4: Assessment Design [Revised]

General Description

Focus of Assessment Efforts in Context of Complete Goal Specification

Primary Focus (Core Tasks)

In the context of my goals, my assessments will be focused most on cognitive skills related to teamwork. I plan to assess skills like communication, listening, and planning on an individual basis. The components of those assessments would most likely be sub-skills defined in the goals.

Besides individual skill assessments, I also plan to have broader assessments that look at all the skills together. The types of assessments will align with the types of practice I plan: practice of individual skills and whole task practice.

The core tasks for the course will be working in small groups, focusing either on an individual skill or whole-task practice. I will use three primary assessments for these tasks: peer-assessment, instructor-assessment, and self-assessment. The assessments will use common rubrics with space for additional comments so that feedback is consistent across all of them.

Secondary and Tertiary Coverage (Other Evidence)

Besides peer, instructor, and self-assessments for work in small groups, I will use case-study assessments and short reflections for evidence of learning.

I will ask students to observe and assess other small groups and case studies. These assessments address the goal of students being able to observe group interactions and choose appropriate strategies to respond to various challenges. These assessments will be informal and verbal (not rubric based).

Since I want students to think metacognitively about their work in groups, I will also use small reflections as assessments. Essentially, students write briefly about how they feel they are progressing in a group work skill, and based on that self-assessment and their peer-assessments, what they plan to do to improve in the future. Feedback on reflection tasks will take the form of short comments from the instructor.

Purpose of Assessment

Formative vs. Summative

Since the goal of my course is skill development and there is only a pass/fail grade associated with it, the focus is very much on continual practice and feedback. Similarly, given that this is a pass/fail, low-stakes course, student performance will receive final grades based on progress rather than absolute performance. Students should improve their teamwork skills over time, and make progress relative to their baseline performance at the beginning of the course.

Students in my course continuously receive evaluations of their performance and proficiency for both individual teamwork skills and their overall teamwork skills. The purpose of these

assessments is primarily formative because students are expected to incorporate feedback from the assessments into further practice. The rubrics are designed to give students feedback about specific areas of their performance (i.e., individual criteria on the rubric) so that they can address those areas and improve their performance overall.

One risk of using primarily formative assessments is that students will not have a clear understanding of how they are doing overall, and want to have a clear-cut judgment of their performance. I think that the way in which I ask students to interpret the feedback they receive in each class should help to avoid this problem. Because students have to aggregate all of the feedback they receive onto one rubric at the end of class, they should be able to clearly see how they are performing overall (based on where they are rated on the rubric).

One part of my course in which assessments are summative is the regular reflection assignment. For that assignment, I will likely not provide extremely specific feedback for all students. I expect to give most students a simple completion grade, and only provide more specific feedback to students who are having trouble with the assignment.

Student vs. Program Focused

Since my course is not part of a larger program and there are few other audiences for the assessments, my assessments are very student-focused. The assessments are meant to give students targeted feedback on their group work abilities that they can incorporate into further practice. However, the outcomes of assessments will also affect the way the course progresses. For instance, if one particular skill seems very challenging for most students, there is enough flexibility in the course schedule that we could spend extra class time on that skill.

The course's assessments will also serve as an indicator to me about how effective the course is in improving students' teamwork skills. The clearest example of this is that, for my research design, I will use assessments of students overall teamwork skills to track how students improve during the course.

Justification

Assess progress toward goals

- Weekly assessment on same comprehensive rubric should help students track progress toward major course goals.
- Criteria on assessments are taken explicitly from goals specification.

Assessments focus instruction

- Assessment from practice activities in class guides in-class discussion and further practice during the same class session.
- Assessments from earlier classes in the semester guide how time will be spent in later classes.

Assessments support learner motivation and metacognition

- Weekly assessment on same comprehensive rubric should help students track progress.

- Rubrics for skills and goals give students a clear picture of what they need to do to perform well.
- Accumulated feedback from tasks in each class session will allow students to reflect in between classes and develop goals to improve for future tasks. (Some reflections will be assessments in their own right).
- Because peer feedback will be a major component of the feedback that students receive, and because that peer feedback will all be framed in a consistent way (based on a rubric), students will be able to look for patterns of error. For instance, if all of a student's peers rate them low on their capacity to seek others' ideas during discussions, a pattern would be apparent on the communication rubric. The weekly reflection assignment explicitly asks learners to identify these patterns.

Specific Assessments

1) Individual Assessment: Overall Teamwork Skills

Content/Cognition: What goals are the targets of the assessment?

This assessment targets the top level goals for students in the areas of

Interpersonal Skills and Communication
Conflict Resolution and Negotiation
Planning
Collaborative Work/Meetings
Accountability

It basically assesses how well students are doing in each major skill area, and how each component skill is affecting their overall ability to do teamwork well.

Format/Observation

This assessment will be used across all whole-task practices for the class. These practice exercises will place student teams in scenarios where they need to work together to solve a problem, make a plan, or produce something. This assessment will also be used to assess students' performance in longer-term (weeks-long) projects.

Students will receive completed rubrics from their teammates, student observers, and me. After completing a whole-task practice, team members will fill out the assessment for each of their teammates, highlighting the area on the rubric where they think their teammate falls and writing more specific comments. For class exercises where teams observe each other, student observers will fill out this assessment for members of the team being observed. Depending on how many students enroll in the course, I will likely assess each student using this rubric every other week (since I can't observe all students during every class for enough time to assess them).

For most of the goals (i.e., all but Accountability), the descriptions of performance criteria are qualitative. Though the descriptions are detailed, having these detailed descriptions should help students become increasingly familiar with criteria for each of the goals. Additionally, as students become more familiar with the assessment, they will likely be able to rate each other

using it without having to read each description and just use the descriptions when they are unsure about a rating.

Criteria	Beginning	Developing	Accomplished	Exemplary	Comments
Communication					
Establishes positive working relationships with teammates. (Goal 1)	Focuses on task to the exclusion of personal relationships.	Gets to know teammates at superficial level.	Gets to know teammates, including their interests and preferences.	Gets to know all teammates, demonstrates trust and respect for other teammates.	
Communicates openly, supportively, and effectively with teammates (listening and speaking). (Goal 2)	Listens but does not send signals to show that they are listening or respond to speaker. May speak in ways that are unclear or unhelpful.	Sometimes practices active listening. Some of what they say is helpful, some is not.	Good listener most of the time. Asks helpful questions. Expresses opinion honestly and constructively.	Listens to every member's contributions attentively. Speaks clearly and their message is always clear and easy to understand.	
Facilitates communication between teammates. (Goal 3)	Focuses on own opinions and objectives.	Expresses self in a way that promotes an open, honest atmosphere.	Expresses self in an appropriate way. Asks for others opinions, gives constructive feedback.	Expresses self well. Asks questions and gives constructive feedback. Connects and synthesizes ideas. Makes sure everyone knows what's going on.	
Participates in formulation of ground rules at the beginning of a project. (Goal 8)	Does not understand the need for ground rules.	Listens while group creates ground rules, but does not actively help to write them.	Contributes ideas and gives feedback on most ground rules.	Tries to engage all members in creation of ground rules, get everyone's buy in. Makes sure there are ground rules for all necessary areas.	
Conflict Resolution and Negotiation					
Engages in productive conflict and avoids unproductive conflict. (Goal 5)	Behaviors may inadvertently create conflict.	Differentiates between productive and unproductive conflict. Self-corrects when they realize a conflict is unproductive.	Does not initiate unproductive conflicts. Willing to participate in productive debate.	Initiates and participates in productive conflicts. Helps end unproductive conflicts.	
Negotiates effectively. (Goal 6)	Struggles to communicate well and maintain composure during conflicts.	Becomes somewhat emotional during conflict. Tries to keep debate rational.	Mostly remains calm and rational during conflicts. Tries to find common ground and reach a compromise.	Always stays calm and rational during conflicts. Stays focused on larger goals and tries to find common ground. Maintains good personal relationships with opponents.	
Helps to mediate conflicts. (Goal 7)	Does not engage in conflicts that they did not initiate.	Points out when conflicts are not productive.	Often persuades others to drop unproductive arguments. Contributes to negotiations.	Always helps others avoid unproductive conflicts. Always helps opponents in a productive conflict see common ground and comes up with ideas for compromises.	

Planning					
Helps to make plans to organize project. (Goal 9)	Begins project without planning first.	Suggests few deadlines for steps of the project without clear rationale.	Suggests deadlines for each part of a project that are based either on prior experience or expert opinion.	Suggests a timeline based on clear rationale that takes into consideration time necessary to organize and coordinate team members.	
Coordinates work with teammates. (Goal 10)	Works on project without making it clear what part they are responsible for or what they expect others to do.	Accepts assigned work or suggests dividing work without considering how to coordinate with others.	Discusses task division with teammates and makes it clear what they will do and what they expect others to do.	Discusses task division with teammates. Coordinates tasks efficiently. Communicates responsibilities clearly and keeps team up to date about what they are working on.	
Talks about division of work openly with group. (Goal 11)	Doesn't engage in group discussions about division of work.	Comments on division of work, but not openly.	Talks openly about division of work, clarifying roles, responsibilities, and expectations.	Talks openly about division of work, even when it has become an uncomfortable issue. Suggests ways to divide task more fairly and effectively.	
Collaborative Problem Solving/Meetings					
Contributes when the group solves problems together. (Goal 12)	Does not actively participate when the group solves problems together.	Participates when the group solves problems together. Comments more than they offer their own thoughts.	Actively participates in collaborative problem solving. Contributes ideas and helpful comments.	Participates in collaborative problem solving. Contributes ideas and helpful comments. Encourages others to contribute and limit criticism while generating solutions.	
Uses time in group meetings effectively. (Goal 13)	Tends to get off topic during meetings.	Can get off topic during meetings. Recognizes it when someone else points it out.	Stays on task during meetings and intervenes when group is getting stuck.	Stays on task during meetings. Intervenes quickly when group might go off topic. Summarizes and seeks consensus to keep meeting moving along.	
Accountability					
Reliably completes assigned work on time. (Goal 14)	Often fails to complete assigned work or finishes it late.	Fails to complete assigned work or finishes it late several times.	Almost always completes their work on time.	Always completes work on time.	
Focuses on results and goal. (Goal 15)	Often becomes distracted by details of project. Gets caught up in politics rather than focusing on outcomes.	Sometimes get caught up in details and politics rather than focusing on the overall goal.	Rarely loses sight of overall goal. Focuses on outcomes.	Never loses sight of the goal. Focuses on results rather than details or politics. Reminds others of the goal when necessary.	
Holds him/herself and others to high standards. (Goal 16)	Does work that is not high quality/usable for the project.	Some of their work is not high quality—has to be worked on more by other members.	Does work that is high quality and can be used without further revision.	Does high quality work and effectively encourages others to do high quality work as well.	
Takes initiative and does what needs to be done to help the team succeed. (Goal 18)	Waits for others to assign work. Doesn't volunteer ideas, doesn't volunteer to take on tasks.	Occasionally volunteers ideas, rarely volunteers to take on work that they are not assigned.	Volunteers ideas often. Will sometimes volunteer to take on work that wasn't assigned to them.	Volunteers ideas. Does what needs to be done for the team to succeed, either for the task or the process overall.	

Prioritizes interests of the team over own interests. (Goal 17)	Puts own goals ahead of team. Not willing to compromise or accept solutions that are not their own.	Occasionally will sacrifice their own interests for the interests of the team. Compromises reluctantly.	Mostly puts the team's interests ahead of their own. Will usually compromise and accept others' solutions.	Always puts the team's interests ahead of their own interests. Compromises and looks for the solution that will lead to the best outcome for the team.	

Interpretation

After the overall teamwork assessments for each student are completed during a class session, students spend a few minutes at the end of the class session aggregating the results on the weekly reflection assessment, marking off where others rated them on the rubric that day.

I will collect the reflection assessment each week. Based on students' self-assessments, the summary of their peer ratings, and my own observations, I will be able to get a sense of where each student and the class as a whole is struggling or progressing. I will use the summary feedback from the completed rubrics to get a big picture view of students' teamwork skills throughout the semester, and to plan instructional interventions to help them further develop their skills.

Standards: Validity

This rubric is based off established measures for teamwork ability, including Stevens and Campion's KSA for teamwork. It is unlikely that a student could have strong teamwork skills and do poorly on this assessment, and it is unlikely that a student could have poor teamwork skills and do well on this assessment.

Standards: Reliability

Because the criteria on this rubric include qualitative descriptions of observable behaviors, reliability across raters and sessions should be good. Since students will be trained on how to use the rubric at the beginning of the semester in class, inter-rater reliability should be good. If peers disagree strongly in their assessments of another student, then I will resolve the disagreement by looking at my own assessments, the student's self-assessments, and possibly through discussion with the student-raters themselves.

2) Goal-Specific Assessment: Facilitating Communication

Content/Cognition: What goals are the targets of the assessment?

This assessment targets Goal 3:

Facilitate communication within the group, along with its two sub-goals:

- "Monitor communications between group members," and
- "Act to make communication in group more effective."

When students observe and rate other students using the rubric, they will practice monitoring communications between group members. When they participate in the exercise themselves, students will practice the second sub-goal—acting to make communication in the group more effective.

Format/Observation

Students will use this rubric in the context of a class exercise on Facilitating Communication during Class 4, which focuses on Facilitating Communication and Organizing Logistics of Communication. For a detailed description of the exercise, see "Specific Activities: Sample Class" in the next section (Instructional Design).

Criteria	Beginning	Developing	Accomplished	Exemplary	Comments
Asks questions to clarify what is being said (3.2)	Rarely	Sometimes	Often	Often + uses good judgment and timing in doing so.	
Asks for others' opinions. (3.2)	Rarely	Sometimes	Often	Often + uses good judgment and timing in doing so.	
Gives honest, constructive feedback on others' ideas. (3.2)	Rarely	Sometimes	Often	Often + uses good judgment and timing in doing so.	
Expresses opinion honestly and tactfully. (3.2)	Rarely	Sometimes	Often	Often + uses good judgment and timing in doing so.	
Offers their own ideas. (3.2)	Rarely	Sometimes	Often	Often + uses good judgment and timing in doing so.	
Ensures that ideas are connected / discussion is coherent. (3.2)	Rarely	Sometimes	Often	Often + uses good judgment and timing in doing so.	
Works to make sure all team members are engaged in discussion. (3.2)	Rarely	Sometimes	Often	Often + uses good judgment and timing in doing so.	

Encourages others to communicate in an open and supportive way. (3.2)	Rarely	Sometimes	Often	Often + uses good judgment and timing in doing so.	
Transparent about their communication style. (3.2)	Rarely	Sometimes	Often	Often + uses good judgment and timing in doing so.	

This rubric uses a frequency-based description of performance levels. In this case, frequency-based descriptions seemed appropriate because they will facilitate the rubric being used more quickly (students won't have to read descriptions for each level of performance), and because the criteria on the rubric are generally observable actions/behaviors that do not require as much description.

Interpretation

Students in the course will receive rubrics, usually rubrics completed by their peers, right after the in-class practice exercise during which they were assessed. The rubrics should give students immediate feedback about what they did right and wrong while they can still remember. At the end of class, students will aggregate the feedback they receive on the Standard Weekly Self-Assessment.

I will use students' aggregate feedback to get an idea of how each student and the class as a whole are performing on the specific skill of Facilitating Communication. I can use this information to give students individual feedback. If, based on this assessment, many students in the class are struggling with one aspect of the skill, then I can address it in later classes. For instance, if many students are struggling to give constructive feedback, then I could spend extra time in a later class discussing what makes feedback constructive and going over examples of constructive vs. unconstructive feedback.

Standards: Validity

It is very unlikely that a student could be very good at facilitating communication and still do poorly on this assessment, especially since the assessment is based primarily on observable behaviors. It is also unlikely that a student could do well on this assessment without being good at facilitating communication.

Standards: Reliability

Given the same assessment after the same class at two different times, this assessment seems like it would still give similar results. Test-retest reliability might be an issue due to natural variation; a student might perform poorly on the assessment if they were in a bad mood, for instance. Still, practically, the assessment's design should be reliable enough to serve the purpose of giving students specific feedback and giving me a sense of students' skill level.

Like the overall teamwork skills rubric, this rubric ensures inter-rater reliability by using criteria that are observable. Additionally, discussion of the rubric with students prior to the exercise/assessment should help to ensure inter-rater reliability for peer assessments.

3) Standard Weekly Self-Assessment

Content/Cognition: What goals are the targets of the assessment?

This assessment addresses two of the broad, metacognitive goals for the course:

22. Identify own strengths and weaknesses in group work.
23. Think about how to handle own weaknesses in group work.

Format/Observation

Students will also create a summary of the feedback they received that day on their group work overall (and possibly for the individual skill addressed that day). Students will also write a few sentences in response to the question prompts on the self-assessment sheet.

Sample Student's Self-Assessment

Please use the attached rubric to aggregate all of the feedback you received. For each completed rubric you received, put a number in the box where someone rated your skills. For your self-assessment, put a 0 in each box where you rated yourself.

[Example: for Facilitating Communication class—Students aggregate feedback from skill-specific practice for each class.]

Criteria	Beginning	Developing	Accomplished	Exemplary
Asks questions to clarify what is being said (3.2)			0, 2, 3	1, 4
Asks for others' opinions. (3.2)		1	0, 2, 3, 4	
Gives honest, constructive feedback on others' ideas. (3.2)		0, 1, 2	3, 4	
Expresses opinion honestly and tactfully. (3.2)		0, 1, 4	2, 3	
Offers their own ideas. (3.2)			0, 2, 3	1, 4
Ensures that ideas are connected / discussion is coherent. (3.2)		1	0, 2, 3, 4	
Works to make sure all		0, 1, 2	3, 4	

team members are engaged in discussion. (3.2)				
Encourages others to communicate in an open and supportive way. (3.2)		0, 1, 4	2, 3	
Transparent about their communication style. (3.2)			0, 2, 3	1, 4

Criteria	Beginning	Developing	Accomplished	Exemplary
Communication				
Establishes positive working relationships with teammates. (Goal 1)			0, 2, 3	1, 4
Communicates openly, supportively, and effectively with teammates (listening and speaking). (Goal 2)		1	0, 2, 3, 4	
Facilitates communication between teammates. (Goal 3)		0, 1, 2	3, 4	
Participates in formulation of ground rules at the beginning of a project. (Goal 8)		0, 1, 4	2, 3	
Conflict Resolution and Negotiation				
Engages in productive conflict and avoids unproductive conflict. (Goal 5)		0	1, 2, 3, 4	
Negotiates effectively. (Goal 6)		0, 4	1, 2, 3	
Helps to mediate conflicts. (Goal 7)		1, 3, 4	0, 2	
Planning				

Helps to make plans to organize project. (Goal 9)			0, 1, 2, 4	3
Coordinates work with teammates. (Goal 10)		4	0, 1, 2, 3	
Talks about division of work openly with group. (Goal 11)		0, 1, 4	2, 3	
Collaborative Problem Solving/Meetings				
Contributes when the group solves problems together. (Goal 12)		0, 1, 2	3, 4	
Uses time in group meetings effectively. (Goal 13)		4	0, 1, 2, 3	
Accountability				
Reliably completes assigned work on time. (Goal 14)			0, 1, 2, 3, 4	
Focuses on results and goal. (Goal 15)		1, 3	0, 2, 4	
Holds him/herself and others to high standards. (Goal 16)		0, 2, 4	1, 3	
Takes initiative and does what needs to be done to help the team succeed. (Goal 18)			0, 1, 2, 3, 4	
Prioritizes interests of the team over own interests. (Goal 17)		2, 3	0, 1, 4	

1. How did you incorporate feedback you received last week on listening and speaking into the work you did today? (See question 4 from last week).

Last week a lot of people thought that I did not send signals to indicate that I was listening, and that I didn't ask people to say more about their ideas often enough. Today, I made sure that I looked people in the eye more when they were speaking, and I tried not to fidget as much. Also, I asked questions to two of my teammates when they brought up ideas.

2. What patterns did you notice in the feedback you received in class today? Overall, what do others think you did well, and where do they say you need to improve?

Overall, people said that I did a good job of asking questions to clarify what's being said and offering ideas. People said that I needed to work on encouraging others to communicate. People also thought that I did a good job of coming up with ways that the group in the case study could handle communications.

3. What do you think you did best today? Where do you think you need to improve?

I think I did a good job of asking questions to my teammates. I think that I need to work more on making sure that I give more constructive feedback about others' ideas. I asked questions when my team was talking about how we should arrange communications for the case study group, but I didn't really tell people what I thought about their ideas.

4. What will you do in the future to become better at facilitating and organizing communication?

I will ask for others' opinions, not just asking what they meant after the fact. I'll also remember to consider how comfortable my teammates are with technologies when deciding on communications mediums.

Interpretation

I will be the primary audience for students' self-assessments. I will read them to get a sense of how well each student is able to judge their own strengths and weaknesses and plan to improve. I will keep students' self-assessments for each week and track their progress in two ways. First, I'll look at their aggregate scores on the overall teamwork evaluation to see it those have improved. I'll also look to see if students improve on the areas that they specified in the prior week's class. If a student is not making progress, then I will communicate with him or her one on one, giving more specific feedback and discussing (likely after class) what might be going on.

However, the most important audience for the self-assessments is the students themselves. Responding to the self-assessment questions will help them practice using feedback to improve their teamwork skills. The combination of individual reflection and summary of others' feedback should also help them understand their behavior from others' perspectives.

Standards: Validity

Because the prompts ask students to identify their strengths and weaknesses and to plan how to handle their weaknesses, this self-assessment should be a very valid test of how a student is progressing on the metacognitive goals. It is very unlikely that a student could have the targeted metacognitive skills and still do poorly on this assessment. It is also unlikely that a

student could do well on this assessment without having the metacognitive skills that it is exercising.

The fact that the assessment is written might be a challenge to its validity—someone who cannot express themselves well in writing might not be able to answer the questions in a way that reflects their level of metacognitive thinking. Nonetheless, it seems fair to expect a rudimentary level of writing skill from the Carnegie Mellon undergraduates who will be completing the assessment.

Standards: Reliability

Given the same assessment after the same class at two different times, this self-assessment seems like it would still give similar results. Inter-rater reliability is not relevant for this assessment.

5: Instructional Design [11/11/11]

General Description

Learning Environment

For my course, the course climate is extremely important because so much of the class depends on my interactions with students and their interactions with one another. According to How Learning Works, a good course climate has several features:

- mistakes are opportunities to learn *
- accountable talk *
- sense that teacher is approachable/available
- openness and comfort *
- respect *
- hospitable
- familiar *
- cooperative *

In the above list, the features that will be most important for my course are starred. For my course to work well, everyone will need to respect one another, speak accountably, cooperate, and treat mistakes as positive opportunities. These features will be essential for course activities like giving feedback to other group members.

Essentially, the course climate needs to allow students to feel comfortable giving open, honest, and constructive feedback to one another. It would be very easy for students to become defensive regarding feedback about, say, needing to be more polite to others or more positive when discussing ideas. A student becoming defensive toward feedback would be detrimental to the overall goal of improving group work through feedback and practice. To avoid this, I need to foster a positive, supportive climate.

I need students to "buy into" my course climate. To do this, I plan to emphasize several ideas:

- Learning about collaboration will help you in your other classes and projects at CMU.
  - You'll be able to achieve more and avoid a great deal of frustration when working with others.
- Working well with others will make it easier for you to get a job.
- The point of this class is for everyone to get better at collaboration, and it requires collaboration to do that. Most of your learning is going to come from the feedback that other students give you, and the feedback you give other students is going to help them learn.

About Expectations for Student-Taught Courses

Anecdotally, undergraduate students have certain expectations about student-taught courses. Common beliefs about student-taught courses are:

1. Student-taught courses will be fun and/or teach practical skills.
2. Student-taught courses won't assign homework (little, if any).
3. Student-taught courses will be less formal than traditional academic courses.

These expectations have some implications for my course. Expectations 2 and 3 should not be problematic—I'm not planning to assign a great deal of homework, and my course will have an informal climate. However, the expectation that student-taught courses will be fun could be an issue.

I will try to balance the need for fun with the need for practicality and transfer. To do this, I will use fun examples from movies and TV shows. Some TV shows I will look to for examples of teamwork concepts are:

- Big Bang Theory
- Friends
- Seinfeld
- Survivor
- The Office

For the longer-term whole task practices, I will try to find projects that are more realistic. Some potential projects include:

- Create a board game and playtest it
- Plan a late-night event
- Write a proposal and constitution for a new club on campus
- Conduct a survey about students' opinions of campus food and prepare a presentation to give to the university's administration about the results
- Create an architectural design and scale model of a roller coaster

The context of my longer term projects may also depend on possible collaborations. For instance, if Game Creation Society (an undergraduate club that makes computer games) agrees to sponsor my Stu-co (recommending that club members take it and offering members to help teach it), then the projects could all be game-design projects, varied in scope so that they would take different amounts of time.

On the other hand, if I were to collaborate on the course with the Information Systems department, the projects could be part of the freshman "Concepts of I.S." course. The projects might be writing a project proposal, giving a presentation, and/or designing a website or application.

(For more on possible collaborations, see the Conclusion section.)

Overall Routines

As noted in the context section, I will have fifteen 2.5 hour class sessions. Since my course is very skills-centered, most class time will be devoted to developing students' group work skills through practice and feedback.

Below, activities are coded using the WHERETO elements from Understanding by Design.

The elements of WHERETO:

- **W** - Where is it going?
- **H** - Hook the students

- **Eq** - Explore and equip
- **R** - Rethink and revise
- **Ev** - Exhibit and evaluate
- **T** - Tailor to student needs, interests, and styles
- **O** - Organize for maximum engagement and effectiveness

The class routine will look something like this (all time estimates are approximate).

- Class begins
- ~5 minutes for people to socialize
    - practicing interpersonal skills
    - a bit of a warm-up for more interactions as class progresses
    - supporting friendly class environment
- ~45 minutes working on a component skill
    - a little (10-15 minutes) direct instruction/discussion
        - brief overview of what we've done so far and where that day's class fits into the larger context of course goals **W**
        - brief introduction to the component skill that we'll be working on first that day **W, Eq**
            - possible discussion element: asking students about past experiences related to skill **H**
                - opportunity to draw out misconceptions
    - short, focused practice for component skill
        - e.g. 10 minutes in group practicing dividing up a task
        - other parts of group work task may be scaffolded **Eq**
            - e.g. for task on communication, plan for project (tasks, roles, requirements) would be provided
    - feedback and discussion about exercise (10-15 minutes) **Ev, R, Eq**
        - peer evaluations
        - my feedback (at group level)
        - addressing misconceptions identified before task
        - discussion of how exercise relates to principles, going more in depth with principles that were particularly relevant in the practice
    - another practice exercise for same component skill **R**
    - another round of feedback and discussion **Ev, R, Eq**
        - for some component skills, I'll split the class in half into people doing the exercise and people observing the exercise, then switch the groups during the second practice session; for others, everyone will do both practice sessions
            - observation provides scaffolding for metacognition (easier to observe others than yourself) **E**
            - other groups function as "case studies"

        - for some component skills, if practice tasks and feedback need more time, I can do only one, longer practice exercise and one, longer round of feedback/discussion
- ~45 minutes working on a component skill **[for first half of semester]**
    - As above
        - During the first half of the course, this time will be for practice of the component skill
        - For the second half of the course, this time will go toward meetings for a long-term team project—whole task practice.
- ~40 minutes working on a whole-task practice exercise **O**
    - a mini-project working in temporary teams or working with people in a the longer term project groups
    - includes time for group members to give each other feedback **Ev, R**
- ~10 minutes for wrap-up **R, W**
    - reflection and discussion, connecting today's class to larger context of course as a whole
    - preview of next class ("Next week we'll…") **W**

Actual Curriculum Content: Activities and Sequence

Semester Overview/Sequence

Class	Agenda	Learning Goals Addressed
1	Introduction to Course/goals Pretest: Small task/short project Feedback on pretest/areas for improvement Practice giving feedback to others/discussion of it	[*Instructional goals*: assessing prior knowledge, establishing course climate, establishing importance of learning goals, transparency about what course will be]
2	Practice **meeting people** Practice **setting group norms** Whole Task: Start short-term group project	**Goal 1:** Establish positive working relationships with teammates. **Goal 8:** Set standards at the beginning of the project.
3	Practice **active listening** Practice **clear speaking** Whole Task: Finish short-term group project	**Goal 2:** Communicate effectively with teammates.
4	Practice **facilitating communication** Practice **organizing logistics of communication** Whole Task: Start medium-term group project	**Goal 3:** Facilitate communication within the group. **Goal 4:** Organize logistics of communication /information sharing.
5	Practice **conflict resolution and negotiation** Whole Task: Continue medium-term group project	**Goal 5:** Engage in productive conflict and avoid unproductive conflict. **Goal 6:** Negotiate effectively. **Goal 7:** Mediate conflicts within group.

6	Practice **collaborative problem solving** Whole Task: Continue medium-term group project	**Goal 12:** Facilitate and participate in collaborative problem solving.
7	Practice **effective meetings** Whole Task: Finish medium-term group project	**Goal 13:** Use time in group meetings effectively.
8	Practice **defining task and setting goals** Practice **long term planning/time management** Whole Task: Start long-term group project	**Goal 9:** Make plans to organize project.
9	Practice **dividing and coordinating tasks/assigning roles** Whole Task: Continue long-term group project	**Goal 10:** Coordinate work with teammates. **Goal 11:** Transparently discuss workload sharing within group.
10	Practice with **accountability** Whole Task: Continue long-term group project	**Goals 14-18: [**Accountability]
11	Practice on **reflection, feedback, improvement** Whole Task: Continue long-term group project	**Goal 19:** Think reflectively about group work in real life. **Goal 20:** Identify own strengths and weaknesses in group work. **Goal 21:** Think about how to handle own weaknesses in group work.
12	Open Whole Task: Continue long-term group project	[*Instructional goals:* Adapt to learners (**T**).]
13	Open Whole Task: Continue long-term group project	[*Instructional goals:* Adapt to learners (**T**).]
14	Open Whole Task: Continue long-term group project	[*Instructional goals:* Adapt to learners (**T**).]
15	Open Whole Task: Finish long-term group project	[*Instructional goals:* Adapt to learners (**T**).]

Justification for Approach

Coherency and Transparency

- Each class session is matched with one of the major goals for the course.
- Assessments used for exercises during class have criteria which align with the sub-goals for the major course goals.
- Each class opens and closes with a discussion of where a skill fits in the overall context of teamwork skills.
- Assessments are entirely transparent. Students receive assessments (rubrics) before practice. Overall assessment of teamwork skills remains consistent through the semester.

Suitable Sequence and Structure

- Each class is focused on one or two target skills that are central to the overall goals of the course. In every class where students practice a target skill, they also engage in a whole-task exercise (at the end of class) to practice integrating it. Placing whole-task activities at the end of the class helps students make the connection between individual skills and larger goals.
- Direct instruction before activities will link concepts and principles to their application.
- The sequence supports skills that build on each other and also connect to the longer term projects (so that instruction is relevant to issues they'll likely face in projects).
    - e.g., Communication is foundational; can be both the cause of and the solution for many conflicts, so it makes sense to begin with communication. Similarly, conflict tends to arise during planning and collaborative work – when teams are deciding what to do and how to do it—so it makes sense to equip students with conflict resolutions skills before moving onto planning and collaborative problem solving skills.

Practice and Feedback to Foster Progress

- Students practice and receive specific feedback on progress during each class session.
- The way the course is arranged allows for timely feedback cycles and both skill-specific and whole task practice.

Adapt to Learners

- Discussions at the beginning of class/before exercises will ask students to relate their prior knowledge (i.e., what they have done in similar team situations in the past) and draw out misconceptions.
- Structure of semester allows for flexibility: if one goal proves more challenging, I can spend an additional class session on it. If there's a related topic that students are interested in (for instance, leadership), there's a place in the schedule to add it.

Transfer: Flexible Application of Knowledge

- Varying tasks, team members, and length of assignment allows students to practice skills in a variety of contexts.
- Exercises that compare the approaches of different teams in the class will allow students to judge between better and worse approaches (e.g., comparing ground rules that teams create).

Metacognition

- Regular reflection assignment supports students' metacognitive skills and orients them toward learning/mastery goals.

Specific Activities: Sample Class

Class 4: Facilitating Communication and Organizing Logistics of Communication (Goals 3 & 4)

Facilitating Communication

Discussion and Instruction: Facilitating Communication

After the class has arrived and had a few minutes to socialize, open the class session.

- Connect to prior sessions/course as a whole, discuss significance
    - Last week, we spoke about how to actively listen and how to speak clearly. That is a big part of facilitating communication. How you speak and listen contributes to the tone of the group as a whole. But what about when you are doing everything right but things are still not working? What happens when someone starts to dominate the discussion or when someone's not talking? Today we'll talk about what you do to get everyone in a group talking, listening, and understanding.
- Example: excerpt from The Five Dysfunctions of a Team; description of a meeting of the corporate team before
    - What tells you that communication isn't working here?
        - class generates ideas
        - be sure to hit on
            - tone of what they say
            - nonverbal communications (way they speak, nonverbal communication)
    - What could the character (new employee) do to facilitate communication in this situation?
        - class generates ideas
        - be sure to hit on
            - asking questions
            - asking for others' opinions
            - giving feedback

Practice and Feedback: Facilitating Communication

Activity

Your team is the Student Dormitory Council for next month and you have to plan an event for next month. You need to consider budget as well as what will appeal to students in the dorm. You have about $200 for the event. What sort of event should you plan? Your group needs to pick an event.

The focus for this activity is practicing how to facilitate communication during a group discussion. Students in observer groups will each be in charge of giving students in task groups feedback on the rubric.

Groups will be paired. Half of groups will observe first, half will observe second. In between, we'll have a brief discussion.

Activity Feedback and Discussion

Each student from the observer group should give feedback to two students from the observed group. Observer students should give the students they observe a completed rubric with written feedback and also explain a little orally.

Tell observer groups to come up with two problems they saw in observed groups and two effective strategies. Aggregate problems and strategies from all observer groups and ask observed groups what advice they would give the observer groups.

Observer groups complete task, observed groups become observers.

After, ask observer groups problems and strategies. Ask class as a whole:

1. What are common problems with communication in groups?
2. How can you help everyone communicate effectively?

See assessment section for Facilitating Communication rubric.

Organizing Logistics of Communication

Discussion and Instruction: Organizing Logistics of Communication

- Connect to prior sessions/course as a whole, discuss significance
    - The last scenario assumed that we had already got the entire group in the same place at the same time for a face to face meeting. You are CMU students—how easy is that to do? Raise your hand if you've ever had trouble getting a group to meet face to face.
    - So, there are other methods of communication
        - face-to-face together, face-to-face individually, email, chat, phone, word of mouth
    - But that doesn't solve the problem
        - Example: email exchange from my RTL group project.
            - I've had issues with this in the past. For instance, freshman year there was one very memorable evening when group members and I had a 37-message long email debate. This was not effective communication.

    - The big question is, how do you choose which method to use based on the situation so that you can communicate effectively even when you can't meet? What should you consider?
        - what group members are comfortable with
        - what makes the most sense for the message

        - i.e., some issues should not be addressed via email or text; not every message has to be handled face-to-face
    - what helps with progress toward objective most
        - i.e., face-to-face may be preferable, but if location's a problem, video chat can work too (can combine them as well)
- Discuss: Why didn't that email exchange make sense? Why was it the wrong method for communication? What other mediums could we have used?

Practice and Feedback: Organizing Logistics of Communication

Activity

You have to write a proposal for one of the SDC events. How are you going to get together to get it done? Everyone needs to approve and sign the final version of the proposal. Decide on if you are meeting, how you'll get the people who didn't come up to date, and when/who/where you are going to write the proposal.

Activity Feedback and Discussion

Class discussion. Compare different groups' proposed solutions. Make list of proposed solutions and check/ask: is it appropriate for the message? Is it effective? Is it efficient? Are all group members comfortable with it?

See what sort of mediums students suggested. Discuss pros and cons. If appropriate, mention other solutions. (See below)

After discussion, ask students to revise proposed solutions. Discuss again.

Disadvantage for all tech tools: Learning curve if people don't already use it.
Google Docs Advantages:
- Simultaneous Editing, Good Version Control, Nice Commenting System, Can Control Level Of Access Easily

Google Docs Disadvantages:
- Conflicts, Discomfort of Group Members, Misunderstandings While Editing

Dropbox Advantages
- Good for sharing files, Keeps backups, Tends to avoid versioning/branching issues, Good for any file type, Allows people to edit files normally (i.e. with Microsoft Word rather than Google Docs)

Dropbox Disadvantages
- Everyone needs to install it on their computer, Not as good at version control as Google Docs, Better solutions may exist for different file types (i.e., version control systems specifically for code)

Google Calendar Advantages:
- Works well for scheduling if everyone has it, Makes sure everyone is working from a common calendar

Google Calendar Disadvantages:
- Works best when everyone has it, Doesn't support many different ways to look at a timeline

Facebook Advantages
- Most people already use it and check it regularly, group "walls" work well for communications, can set it up to send email notifications, good commenting system

Facebook Disadvantages

- Document/photo/file handling isn't great, not good for collaborative drafting, notifications settings can cause issues, most people haven't used it for school work

Project Management Software Advantages

- Custom made for this purpose, many additional features, integrated file sharing and communication, can create really nice timelines/plans, task management

Project Management Software Disadvantages

- People are reluctant to sign up for a service for one project, learning curve, many to choose from and not all are equally useful/usable

Whole Task Practice

Introduce medium-term project. Tell students they'll be working with assigned groups for 4 weeks. Each week, just like in the short term project, you'll have time to meet at the end of class, and you'll also give feedback to each member. Post group assignments on the board.

Project should scaffold:

- task definition – task needs to be clearly defined
- division of task – define what each person in group should be doing
- roles in group—either assign leader or don't
- meetings (don't require many/any out of class meetings)

Project should involve these skills:

- setting norms
- facilitating communication
- organizing logistics of communication
  - do require out of class communication
- collaborative problem solving

A possible project domain:

- In groups of 5, students will design a board game. The board game needs to be Monopoly-like, involving dice, a path on the board, and chance cards. The roles for the task are:
  - Artist 1
    - creates game board
    - coordinates with Designer 1
  - Artist/Writer 2
    - creates chance cards
    - coordinates with Artist 1 and Designer 2
  - Designer 1
    - designs game mechanic for dice and path
    - coordinates with Artist 1 and Artist/Writer 2
  - Designer 2
    - designs game mechanic for chance cards
    - coordinates with Designer 1
  - Writer
    - writes rules for game

        - needs to share a working copy with all other group members (e.g., using Google Docs)
        - coordinates with Designers 1 & 2

This is a suggested timeline for the project (which will take place over the next four classes):

- This class:
    - Come up with ground rules for the team.
    - Choose a theme for the game.
- Next class:
    - Define the mechanics and aesthetics (look and feel) of the game.
- Third class:
    - Make game board and chance cards. Write rules.
- Fourth class:
    - Finish and playtest game.

Students need to decide on a theme for the game and define the mechanics. Students will also have to arrange to get materials to make the board and cards for class. Each team needs to create a playable and fun game—complete with board, cards, and written rules. Each team also needs to turn in the ground rules that they developed to use while they worked.

6: Research Design [Revised]

Basic Research Outline

Research Question(s)

My course on effective group work creates a situation in which I can examine two research questions:

1. What is the effect of targeted instruction on students' ability to work well in teams?
2. How does an intervention that targets students' teamwork skills affect students' ability to work well in teams and attitudes towards teamwork over time?

Experimental Design

Assuming that the pilot semester of the course is successful, I believe that professors might be interested in incorporating my course into their class or program. For instance, a professor who taught an introductory course that included a large group project might want her students to take my course to improve their skills.

Experimental and Control Groups

My research design examines the effect of the course as an intervention. As such, the experimental group is actually the students in the course. Ideally, these students would be randomly assigned to take the course (i.e., by a professor for another course or by their department). The control group for my experiment would be a group of students from the same course or program who were not enrolled in the group work course.

Another possibility would be to use a now and later design, randomly assigning half of the students to take the course during the first half of the semester or the year. In that case, the control group would also take the course, just during the second part of the semester or the year. In this case, I would likely have to use a within-subjects design for my second research question (I would not be able to track long-term development of control group since they would have also participated in the course).

Independent and Dependent Variables

The independent variable for this study would be participation in my course—basically, participation in targeted instruction on teamwork skills. Participation at the most basic level would be binary—a student took the course or did not. However, for finer-grained analysis, I'll also monitor participation by students' attendance and completion of course assignments (i.e., self-assessment/reflection). The dependent variable would be students' ability to work well in teams (immediately after the course as well as over longer stretches of time).

Method (subjects, procedure, materials)

Subjects

The subjects for my study would by Carnegie Mellon Undergraduate students. In an ideal situation, they would be freshmen enrolled in an introductory course that incorporated at least one major group project. Their mean age would be approximately 18, and their demographics

would be relatively similar to those of the Carnegie Mellon undergraduate student body as a whole.

Procedure

At the beginning of the semester, students enrolled in an introductory course would be randomly assigned to enroll in my course. Possibly, the control group of students would be assigned to enroll in another 3 unit, skills-focused course.

Both groups of students would participate in a short group task and be scored on their teamwork abilities by their teammates and a trained observer. The students from both the experimental and control groups would also fill out a self-assessment (not part of the course) on their overall group work skills and attitudes, and a survey about relevant background information (i.e., demographics). This would serve as a baseline measure of their group work skills and attitudes for both groups of students. This task could also be recorded on video to refer back to later.

During the semester, students in the experimental condition would attend my course, participating in targeted practice and receiving feedback to improve their group work skills. The final activity during in each class would be a whole task assessment; I, the students' teammates (anonymously), and the students themselves would fill out the assessment. For students in the experimental condition, these activities would generate longitudinal data on development of group work skills over time (every week).

In the students' associated academic class or program (where they were selected from), students would be required to complete (again, anonymous) peer reviews of each other at the end of their group projects. Both students in the experimental and control groups would be assessed by their teammates on their group work skills.

Ideally, the students' professor would be blind to their treatment condition (course vs. no course), and could provide observations of students' group work skills as well.

At the end of the semester, at the end of the academic course and my course, students would again complete a short group task and be scored on their teamwork abilities.

Ideally, in subsequent semesters, I would follow students from the control and experimental groups, collecting ratings from their peers and their professors on their performance in group projects.

Data Collection & Scoring

The primary form of data collected would be assessments of students' group work skills using the overall rubric created for the course. I would also collect information about aspects of students' backgrounds that might be relevant (i.e., demographics, past experiences working in groups).

Demographic data would be collected at the beginning of the study, when students would fill out a survey about their backgrounds and participate in a group work task.

Assessments of students in the experimental conditions would be collected regularly at the end of each week's course session. Students in the course would receive instruction in how to score each other's abilities (and their own) using the rubric to ensure some consistency in scoring over the course sessions.

Additionally, some activities during the course might be videotaped, providing a more thorough record of students' performance. This would be useful to see how team interactions during class exercises translated into rubric scores.

Hypotheses and Related Predictions

My study would address two research questions.

3. What is the effect of targeted instruction on students' ability to work well in teams?
4. How does an intervention which targets students' teamwork skills affect students' ability to work well in teams and attitudes towards teamwork over time?

Question 1

My hypothesis regarding question 1, is that targeted instruction (participation in a course on group work skills) will improve students' ability to work well in teams significantly. I would also predict that students' abilities for each teamwork skill would shift after a class session focusing on that skill.

The primary measure of students' ability to work well in teams would be their teammates' assessments of them. This measure would be most appropriate because the teammates would have observed all of a teammate's behavior during a task, while I would only see some of it, as I would be observing multiple groups simultaneously. Teammates' assessments would give the most accurate picture of students' group work sills.

Question 2

For question 2, I would predict that students' exposed to a teamwork skills intervention would work better in other team contexts after the intervention. I believe that teammate's scores of their teamwork skills would be higher than those for students in the control group.

Both students from the experimental and control groups would mature over time, both developmentally in terms of interpersonal skills and in experience with teamwork. I predict that students in the experimental group might show slower growth in teamwork skills over time because they would already have made major gains on a teamwork skills learning curve. Students in the control group might show a higher rate of improvement in teamwork skills, because they would have more to learn (the hard way) from their experiences working with teams.

However, another possibility is that students in the experimental condition would have improved metacognitive skills related to group work that would allow them to continue to improve, while control group students would not have the ability to effectively reflect on their group work experiences to improve their abilities. In this case, I would predict that students in

the experimental condition would show continued growth in their teamwork skills over time, while students in the experimental condition would not improve their skills consistently over time. I can also correlate students' improvement in my course with their improvement in their academic course. If I use a now and later design, I can also compare students' improvement in my course with their improvement in the control course.

Assessment of Design Quality

Sampling

This study would use a sample of students enrolled in an introductory academic course involving group work. Ideally, the course would be a mandatory introductory course, so there would not be selection threat from students choosing to enroll or not enroll in the course.

Validity

The primary question for validity in this experiment is whether the assessment of students' teamwork skills is an accurate reflection of their actual capabilities.

The main measure of students' group work skills will be peer assessments. I will check the convergent validity of these assessments by comparing them with instructor and self-assessments. To account for divergent validity, I will check for correlations between students' skills scores and background demographic data (e.g., extensive past experience in teamwork, personality, intelligence). Overall, I believe that the peer assessments will be an accurate reflection of the construct of group work abilities because students' teammates will be able to observe all of their behavior. Because peer assessment feedback is anonymous, students are less likely to modify their ratings based on their overall feelings toward a peer.

Reliability and Triangulation

Inter-rater reliability is an issue for peer assessments of students' teamwork abilities. Students might be assessed differently when they have different teammates. To handle this, I will use additional measures (i.e., instructor and self-assessments) and check the peer assessments against those measures for consistency. The set of assessments: peer, self, and instructor, should combine to triangulate a student's true skill level.

Another measure to ensure inter-rater reliability is that students will be explicitly instructed and have practice assessing teamwork skills. The first or second class of the semester will address how to give feedback to other students using the rubric. Additionally, before students rate each other using various skill-specific rubrics, they will practice rating another group (video, case study, scripted role play) using the rubrics and discuss discrepancies between those ratings.

Nonetheless, some of the variation in students' peer assessments is actually desirable; different students will perceive each other differently, and one aspect of the teamwork skills that my course is trying to develop is the ability to work effectively with many different types of people. If a student only communicates well with one of their teammates, then it would be accurate for other teammates to rate them lower on their communication skills.

Confounds

Maturation and history are the most significant threats to the integrity of my study. Students will be maturing and having a variety of other experiences (i.e., living in dorms, teamwork in other classes and extracurriculars) that would affect the development of their teamwork skills.

I account for these threats in a few ways. First, random assignment of students to experimental and control groups should mean that students in each group are both having relatively similar experiences outside of the course on average. Second, I can check that there are not systemic differences between the two groups of students by examining their pre-test scores.

As a manipulation check for my course, the professor in the students' academic course (my subject pool) could have students complete a survey in the middle and at the end of the semester asking students about their college and class experiences so far and what skills they have learned, including teamwork skills. Hopefully, by doing the manipulation check as part of the academic course and adding other skills to the survey, I will avoid demand effects that might be present if I asked students whether they had developed their teamwork skills in my course.

Conclusion

How Does This Project Exemplify Course Principles?

My course exemplifies course principles explicitly throughout the design. It considers the context and learners before specifying the goals. The goals are compatible both with external standards and students' goals. The design also explicitly focuses on metacognition, so that students will continue to self-assess and improve their skills after the course. The goals guided the design of the instruction and assessment; both assessments and class sessions are matched up with specific goals. So, the goals, assessment, and instruction are all aligned. The assessments are transparent and support learners' metacognition. The instruction is structured to scaffold learners as they develop their overall teamwork skills, and there are multiple opportunities for practice and feedback during each class session and throughout the course as a whole. Finally, my course design itself is an effort to integrate research on how students learn into instruction and assessment.

Challenges

The biggest challenge I faced for this project was not having much knowledge about the domain when I began. As I developed the curriculum, I also spent great deal of time doing research about teamwork theory and practice. To compound this problem, I found that teamwork skills are an ill-defined domain. I did not find many existing resources for teaching teamwork *skills* (there were more resources for teaching theory about group dynamics, but that was not what my course is mean to teach). I think that lacking knowledge of the domain also contributed to some instances of "paralysis by analysis"—time that I spent trying to digest all of the material I found on teamwork theory and translate it into teachable skills. Though I did consult with several experts on teamwork, it was consultation more than collaboration, so I did not get to take full advantage of their expertise.

Another prominent challenge was uncertainty about who my learners would be. Since my course would be (as a Stu-co), open-enrollment, it was difficult to envision who my students would be because it would be very variable.

The last challenge was problems with my project process. When I initially developed my assessments and instruction, I did so while looking at the goals. However, I did not note down exactly how the goals aligned with the assessments and instruction, so I had to backtrack on my assessment and instruction designs later to make the alignment explicit. The other problem I had with my process was that I underestimated the time that would be necessary to develop individual assessments and lesson plans in detail. Because of this, I did not develop as many of the assessments and lesson plans as I had initially hoped to.

Next Steps

I began this project with the intention of teaching this course. At this point, I'm still planning to see this course actually happen. There are three ways that it could be realized:

1. I teach the course as a Stu-co, independently, as I initially planned.

2. I teach the course as a Stu-co sponsored by Game Creation Society. They might be interested in the course because the main activity of the club is to design games in teams, and I know (being a member), that teamwork is often an issue. This would be helpful in two respects
    a. recruiting students—Game Creation Society could recommend that club members take the course
    b. help teaching—the club would likely be willing to have senior members help to teach the course, which would make some aspects of instruction (like observing and giving feedback to students on a one-on-one basis) easier

    To explore this possibility, I need to get in touch with the President and Officers of GCS.

3. I share the curriculum with my home department of Information Systems, and talk to the department director and professors about integrating the teamwork curriculum into the program either by
    a. recommending that students take my course as a Stu-co
    b. integrating my curriculum into existing coursework (e.g., using my teamwork rubrics to assess team processes in group projects in our academic courses)

    To explore this possibility, I need to talk to the Information Systems department director, Randy Weinberg.

For any of these possibilities, though, I need to have a more complete curriculum. This means that I need to

- look through clips of TV shows to find examples of teamwork concepts
- develop rubrics for all the skills I plan to assess (revise rubrics I created earlier so that they explicitly align with goals)
- create lesson plans for all course sessions

Finally, I want to put this curriculum into a format that is more sharable. Many people I have spoken to are interested in my curriculum, and I want to put it into a more presentable format than this project report.

Lessons Learned

When I do educational designs in the future, I would do some things differently. First, when I'm working in a domain with which I am unfamiliar, I'll be more careful to find domain experts who are willing to be collaborators (rather than just consultants).

When developing my goals, I would work with a hierarchical structure from the start, linking different types of goals (knowledge, skills, and dispositions) together.

When developing my assessments and instruction, I also think I would make use of the Ubd templates more. I didn't use them as much as I could have, and I think that simply working

from the Ubd templates in the future would be a more efficient way to develop assessments and lesson plans.

Additionally, while I will definitely explicitly align goals, assessment, and instruction in future projects, I think that I would start developing my instruction and assessment earlier in the process, possibly even in parallel with the goals (or segmenting the goals so that I could work on portions of the goals, then portions of the instruction).

At least for this project, developing the assessments and instruction gave me a clearer idea of what my goals were, and I ended up revising the goals based on the assessments and instruction (and vice-versa). Since my goals, instruction, and assessment, all fed back into one another, and because the instruction and assessment took so much time to design in detail, I think I would begin developing drafts of my instruction and assessments earlier in the process.