



EFFECTIVE GROUP WORK

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*"Teamwork is neither "good" nor "desirable."
It is a fact. Wherever people work together
or play together they do so as a team."*

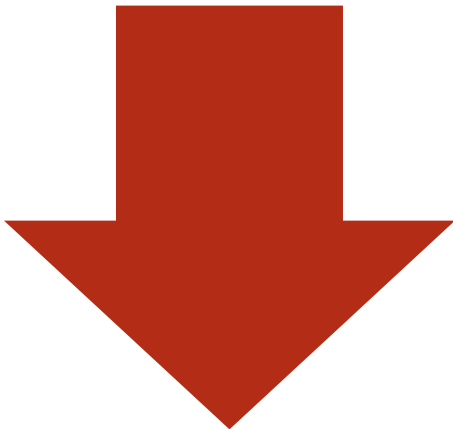
Peter F. Drucker



RATIONALE



Effective teamwork skills
are essential for students'
success



Teamwork skills are
rarely explicitly taught



SINK-OR-SWIM: TEAMWORK ASSESSMENTS

1. Individual Contribution (REQUIRED)

- a. Indicate in the space provided your *individual* contribution to the term project. Be specific about those area(s) that you individually accomplished and/or lead. Be careful not to give me a recounting of what the group accomplished; this section is for you to show how *you*, specifically, contributed to the group's final project.

2. Star performer (REQUIRED)

- a. Choose one, and only one, colleague within your group that contributed the most to the group project, in your opinion. You cannot choose yourself. You need to choose someone. You cannot choose more than one person. Describe what that individual did and why you have selected her or him as the "star performer" within your group.

3. Commentary (OPTIONAL)

- a. This section is for you to add any additional information you wish to provide regarding the project of your colleagues. If one or more individuals did not, in your opinion, contribute as well as they might have – you could indicate that here. Please be specific. Everything will be kept confidential. You may also wish to comment on your TA's involvement. Please don't use this area to expand upon information provided in the first two sections.



“Carnegie Mellon students are known for being very intelligent, but not for working well with other people.”

Ryan Smalley

Vice President – Strategic Initiatives Office at PNC

Adjunct Professor at Carnegie Mellon University



CONTEXT: THE BASICS

- Carnegie Mellon undergraduates
 - age 17-23
 - all majors
- Student-taught course
 - 3 units (1 credit)
 - 3 hours/week
 - One 2.5 hour class each week, little homework
 - graded pass/fail
 - relatively small time commitment



LEARNERS

- My peers
- College-age students
- Prior knowledge
 - likely will vary significantly
 - mostly gained from experience, little explicit knowledge
 - misconceptions probable
- Individual differences
 - cultural background
 - multiple intelligences



“Group projects require that students not only have the same skills and knowledge they would need for individual projects, but also an entirely different set of process-related 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, and resolve disagreements or conflicts if they arise.

Eberly Center

“Students lack the necessary teamwork skills: Strategies”



GOALS: COMPATIBILITY

CMU Standards

- Eberly Center guidelines on group work
- Randy Pausch's tips for working successfully in a group

External Standards

- Teamwork KSA, Michael Stevens
- Michigan Team System

Program

- Not explicitly a goal for CMU undergrads, but collaboration is extremely important in every school at CMU

Learners

- social goals of undergraduates
- practicality of planning skills



GOALS: BROAD CATEGORIES

- Interpersonal skills and communication
- Conflict resolution and negotiation
- Planning
- Collaborative work/meetings
- Leading and participating
- Broad metacognitive goals

Note about Format:

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

Cognitive/Metacognitive is coded like so:

cognitive goal

metacognitive goal



GOALS: LEVEL 1 EXAMPLE

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.

Note about Format:

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

Cognitive/Metacognitive is coded like so:

cognitive goal

metacognitive goal



GOALS: ANOTHER LEVEL 1 EXAMPLE

Planning

1. Recognize importance of initial project planning.
2. Divide work fairly and effectively.
3. Can plan out timeline for a project.
4. *Plan and revise strategies for group work using knowledge of group dynamics.*
5. Believe that with good planning, a group can accomplish more together than the sum of what all the individuals could do.

Note about format:

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

Cognitive/Metacognitive is coded like so:

cognitive goal

metacognitive goal



GOALS: LEVEL 2 EXAMPLE

3) Facilitate communication within the group.

3.1. Know characteristics of open and supportive communication.

- behavior or event oriented
- what a person says matches what they feel
- validate individuals
- give everyone an equal opportunity to speak
- ensure that topics are connected

3.2. Recognize and interpret nonverbal communications of others.

3.2.1. Know major types of nonverbal communication.

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

3.3. 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.

3.4. Act to make communication in group more effective.

- Asks questions to clarify what is being said.
- Asks for others' opinions.
- Gives honest, constructive feedback.
- Expresses opinion honestly.

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



INSTRUCTION: PRINCIPLES

- whole-part-whole to develop mastery
 - learn the component knowledge and skills for a domain, practice integrating them, and effectively apply them
- practice and feedback
 - linking concrete examples and experiences to abstract principles
 - temporarily constraining scope of task
 - scaffolding gradually reduced through semester
 - deliberate practice
- support transfer
 - diverse, realistic contexts
 - varying task length, varying context of scenario-based practice activities in class
 - connecting practice to principles
 - metacognitive activities



INSTRUCTION: CLASS SEQUENCE, PART 1

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 9: Recognize importance of initial project planning.
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: Understand why unproductive conflict occurs. Goal 6: Differentiate between productive and unproductive conflict. Goal 7: Handle different types of conflict appropriately. Goal 8: Manage conflict effectively in different goals.
6	Practice decision-making Practice collaborative problem solving Whole Task: Continue medium-term group project	Goal 15: Choose and use effective decision making strategies. Goal 14: Facilitate and participate in collaborative problem solving. Goal 18: Act as a team player.



INSTRUCTION: CLASS SEQUENCE, PART 2

Class	Agenda	Learning Goals Addressed
7	Practice organizing logistics of meetings Practice effective meetings Whole Task: Finish medium-term group project	Goal 4: Organize logistics of communication and information sharing/collaboration. Goal 11: Can plan out timeline for a project. Goal 16: Use time in group meetings effectively. Goal 17: Monitor use of time in group meetings.
8	Practice defining task Practice long term planning/time management Whole Task: Start long-term group project	Goal 11: Can plan out timeline for a project. Goal 12: Plan and revise strategies for group work using knowledge of group dynamics.
9	Practice dividing and coordinating tasks/assigning roles Whole Task: Continue long-term group project	Goal 10: Divide work fairly and effectively.
10	Practice taking on different roles in group (leading vs. following, etc.) Whole Task: Continue long-term group project	Goal 18: Act as a team player. Goal 19: Contribute to group in leadership or membership roles. Goal 20: Take on roles that fit the group's needs and individual strengths.
11	Practice with accountability strategies Whole Task: Continue long-term group project	Goal 10: Divide work fairly and effectively. Goal 12: Plan and revise strategies for group work using knowledge of group dynamics. Goal 13: Believe that with good planning, a group can accomplish more than the sum of what all the individuals could do.
12	Practice on reflection, feedback, improvement Whole Task: Continue long-term group project	Goal 21: Think reflectively about group work in real life. Goal 22: Identify own strengths and weaknesses in group work. Goal 23: Think about how to handle own weaknesses in group work.
13	Open; Whole Task: Continue long-term group project	
14	Open; Whole Task: Continue long-term group project	
15	Open; Whole Task: Finish long-term group project	



INSTRUCTION: WHY THIS SEQUENCE

- Skills build on each other

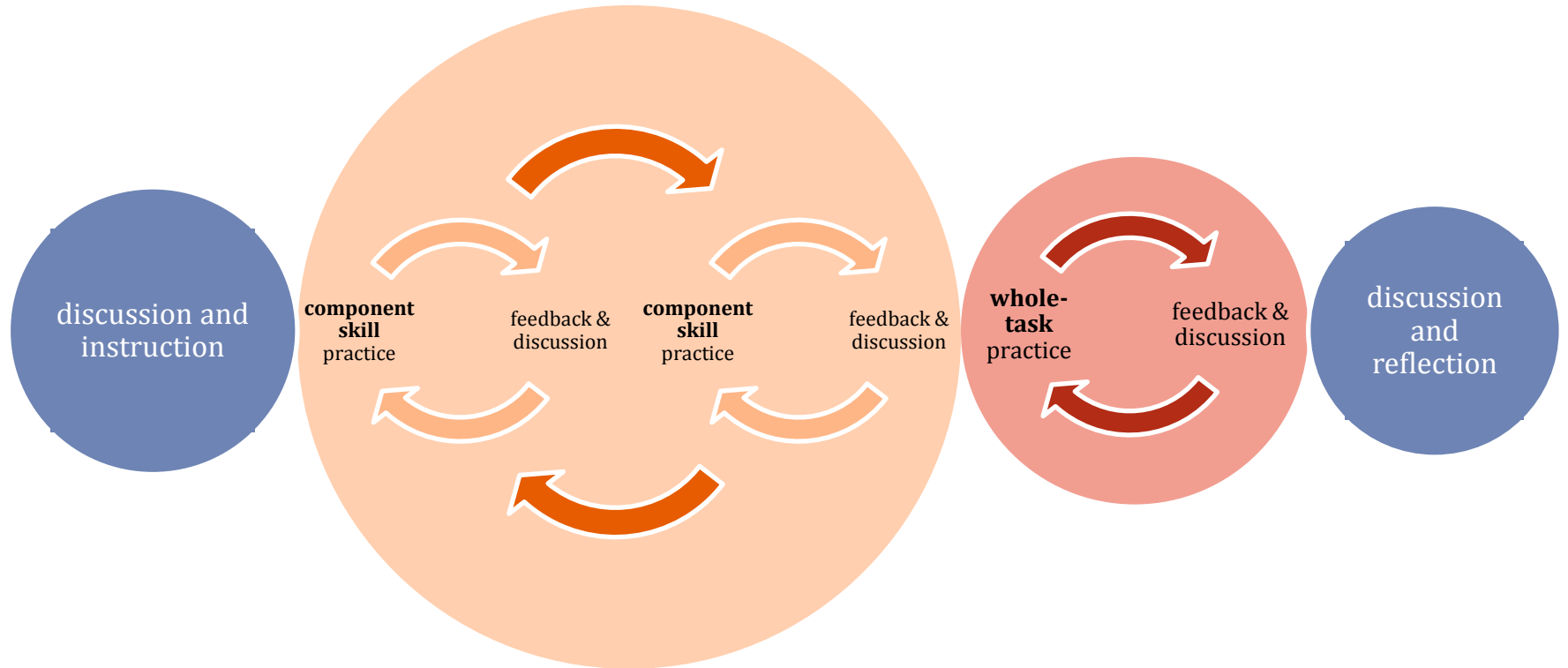
- Communication foundational
- Conflict arises during planning and collaborative work
- Organizational and planning tasks depend on decision-making and problem-solving skills
- Dividing tasks and handling accountability link to role issues
- Reflection on whole-task

- Just-in-time instruction

- course topics should be helpful for weeks-long projects



INSTRUCTION: STRUCTURE OF A CLASS SESSION



ASSESSMENT

- Pass/fail course
- Primarily formative
- Assessors
 - self-assessment
 - instructor assessment
 - peer assessment
 - teammates and other student observers
- Tasks
 - students work in teams during class
 - individual and team level assessments
 - students observe other teams and discuss case studies
 - self-assessment - reflection
- Scope of assessments
 - goal specific
 - whole-task

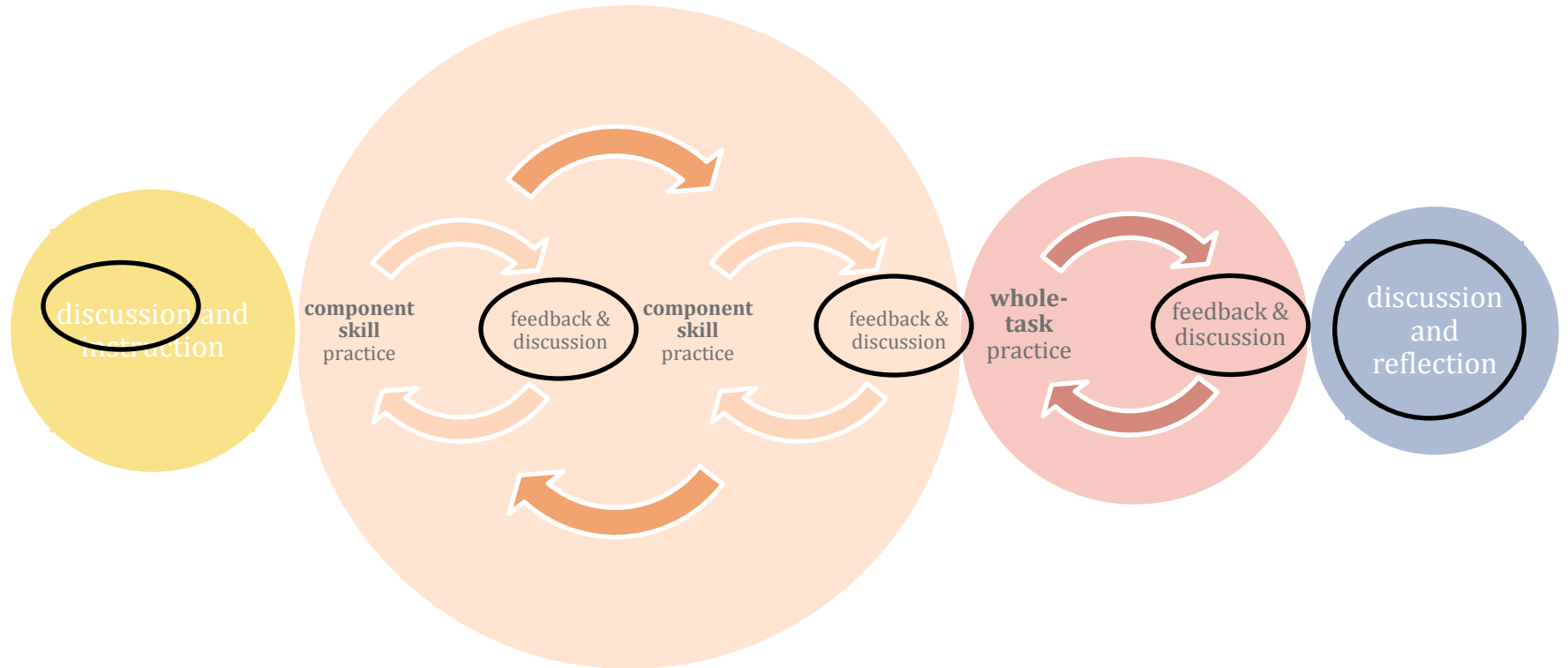


ASSESSMENT: PRINCIPLES

- Assess progress toward goals
 - weekly assessment on same comprehensive rubric should help students track progress
- Assessments focus instruction
 - assessment from focused practice activities in class guides discussion and further practice
- Assessments support learner motivation and metacognition
 - weekly assessment on same comprehensive rubric should help students track progress
 - rubrics give students a clear picture of what they need to do to perform well on tasks



ASSESSMENT



INSTRUCTION AND ASSESSMENT: EXAMPLE

FACILITATING COMMUNICATION AND ORGANIZING LOGISTICS OF COMMUNICATION

Class 4: Instruction

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



INSTRUCTION AND ASSESSMENT: EXAMPLE

FACILITATING COMMUNICATION AND ORGANIZING LOGISTICS OF COMMUNICATION

Criteria	Beginning	Developing	Accomplished	Exemplary	Comments
Asks questions to clarify what is being said. (3.4)	Never	Sometimes	Often	Often + uses good judgment and timing in doing so.	
Asks for others' opinions. (3.4)	Never	Sometimes	Often	Often + uses good judgment and timing in doing so.	
Gives honest, constructive feedback on others' ideas. (3.5)	Doesn't offer feedback.	Offers feedback, but it's not always constructive.	Give feedback often, and it's usually helpful.	Gives feedback with attention to context of situation and individual. Feedback is validating and constructive.	
Expresses opinion honestly and tactfully. (3.4)	Never	Sometimes	Often	Often + uses good judgment and timing in doing so.	
Offers their own ideas. (3.4)	Never	Sometimes	Often	Often + uses good judgment and timing in doing so.	
Ensures that ideas are connected / discussion is coherent. (3.1, 3.4)	Never	Sometimes	Often	Often + uses good judgment and timing in doing so.	
Works to make sure all team members are engaged in discussion. . (3.1, 3.4)	Never	Sometimes	Often	Often + uses good judgment and timing in doing so.	
Encourages others to communicate in an open and supportive way. . (3.1, 3.4, 3.5)	Never	Sometimes	Often	Often + uses good judgment and timing in doing so.	



ASSESSMENT: THE WHOLE TASK

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.	Makes sure that all teammates know each other beyond a superficial level and have positive relationships.	
Participates in formulation of ground rules at the beginning of a project. (Goal 9.1)	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.	
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.	



ASSESSMENT: THE WHOLE TASK

Conflict Resolution and Negotiation					
Engages in productive conflict and avoids unproductive conflict. (Goal 7, particularly 7.2, dependent on goals 5 and 6)	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.	
Handles conflict well. (Goal 7, specifically 7.3)	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 8)	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.	



ASSESSMENT: THE WHOLE TASK

Planning					
Helps to make plans to organize project. (Goal 11, incorporates Goal 9 and 10)	Rarely	Sometimes	Often	Always	
Coordinates work with teammates. (Goal 9 and 10)	Rarely	Sometimes	Often	Always	
Talks about division of work openly with group. (Goal 10.4)	Rarely	Sometimes	Often	Always	



ASSESSMENT: THE WHOLE TASK

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ASSESSMENT: THE WHOLE TASK

Collaborative Problem Solving/Meetings					
Contributes when the group solves problems together. (Goal 14)	Rarely	Sometimes	Often	Always	
Uses time in group meetings effectively. (Goal 16)	Rarely	Sometimes	Often	Always	
Helps team stay on task during meetings. (Goal 16.1)	Rarely	Sometimes	Often	Always	
Facilitates participation by all team members in group meetings. (Goal 16.2)	Rarely	Sometimes	Often	Always	



ASSESSMENT: THE WHOLE TASK

Team Player					
Reliably completes assigned work on time. (Goal 18.1)	Rarely	Sometimes	Often	Always	
Focuses on results and goal. (Goal 18.3)	Rarely	Sometimes	Often	Always	
Holds him/herself and others to high standards. (Goal 18.2)	Rarely	Sometimes	Often	Always	
Takes initiative and does what needs to be done to help the team succeed. (Goal 18, 19, 20)	Rarely	Sometimes	Often	Always	
Prioritizes interests of the team over own interests. (Goal 18, 19, 20)	Rarely	Sometimes	Often	Always	



INSTRUCTION AND ASSESSMENT: QUESTIONS

- Level of detail
 - rubrics
 - use whole-task rubric every week? have modified less detailed form?
 - instructional designs
- Composition of groups
 - different group for each class?
- What to do for short, medium, and long-term group projects?
- Good places to find case studies, video clips. Can you think of relevant examples from pop-culture?



RESEARCH QUESTIONS

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



RESEARCH DESIGN

- Subjects

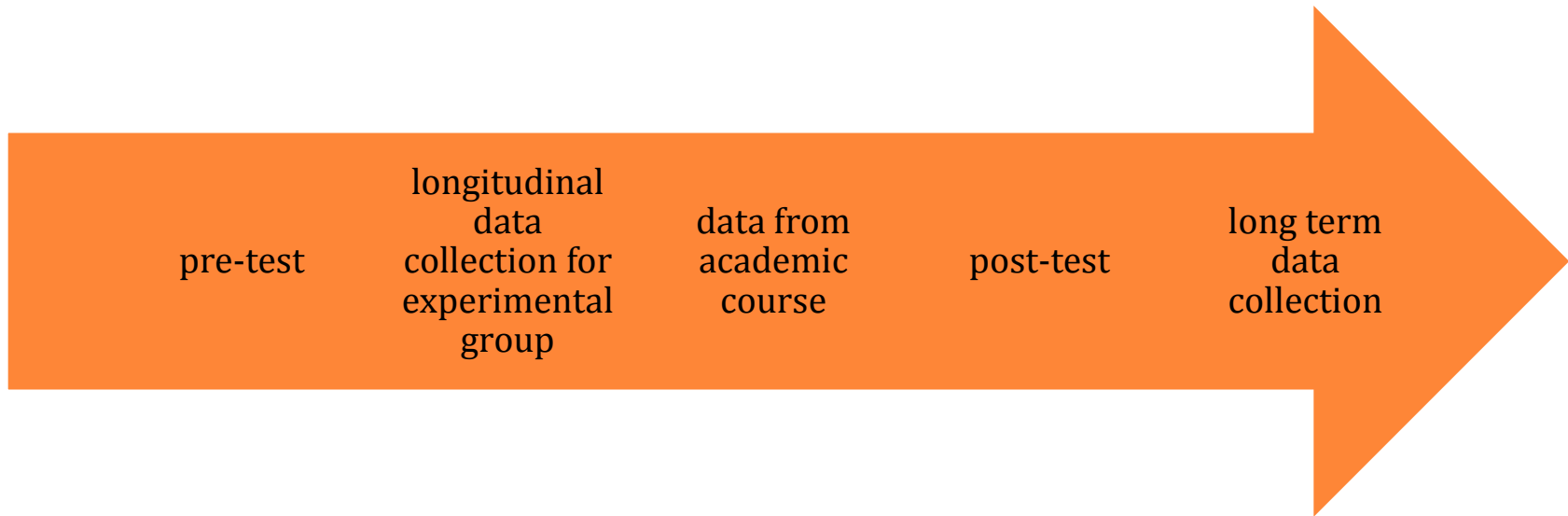
- CMU freshmen from a mandatory introductory course that incorporates group projects

- Experimental and Control Groups

- random assignment
 - control group takes another 3-unit, academic skills-focused course



RESEARCH DESIGN: DATA COLLECTION



RESEARCH DESIGN: VALIDITY, RELIABILITY, CONFOUNDS

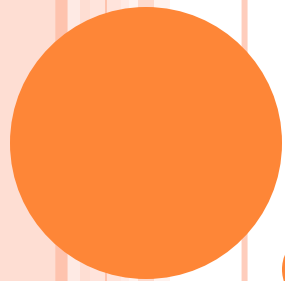
○ Peer assessments

- convergent validity: instructor and self assessments
- divergent validity: demographic and background data
- inter-rater reliability

○ Threats: maturation and history

- maturation from other college experiences
- random assignment
- student reflections as manipulation check





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