

Challenges

Student Attitudes

- Students can acquire bad attitudes about group work that are difficult to shed (Gillespie et al. 2006)
 - Everyone is afraid of loafers
 - Mixed ages can generate challenges (non-traditional mixed with 1st years)
 - Group work with significant outside time requirement is resented, especially if students have this kind of group work in more than one course
 - Switching group members seems to be universally viewed by students as bad—just as they are getting to know each other or getting used to other’s habits (good or bad), or have a schedule they can work with outside of class, switching group members is perceived as jarring, unnecessary, and without benefit.
- Self vs. Instructor-formed groups
 - Instructor-formed groups avoid “cliques”: one paper found a 2-fold higher chance of students reporting worst group experience if students were allowed to form own groups vs. instructor-formed groups (Feichtner and Davies 1984)
 - Another paper found self-selection was preferred: in a study that focused on inclusion of non-native English speakers, 66% of native English speakers indicated that self-selection was their preferred method of group construction. For non-native speakers, this % was initially lower, but became higher (above 70%) after their group experiences. This suggested that their experiences working in groups pushed them toward preferring self-selection. Cognitive (intellectual) anxiety about group was higher in non-native speakers (most likely due to lack of experience with group work) (Strauss and Young 2011)

Group size (many sources)

- Keep groups under 8 people; probably under 6 if any out of class work required
- A group of 2 is too small: not enough diversity of opinion.
- 3-6 probably ideal, depending on nature of work (formal vs. informal)

Evidence on benefits of academically heterogeneous groups

- When high and low ability students are mixed together, lowA tend to probe for more info, point out simple components that are important; highA tend to draw conclusions, teach others, or be creative. All appear to benefit from interaction (Heller and Hollabaugh 1992).
- Mixed groups particularly beneficial for lowA students both attitude-wise and for learning gains, no negative effect on highA students. And, although all highA groups performed well, they didn’t perform better than mixed groups (Connell et al 2016).

Possible ways to form groups

- **Instructor controlled**
 - Academically heterogeneous groups (Assign seating)
 - SAT scores, other standardized assessments, performance on pre-test
 - Completely random (Assign seating)
 - Use random number generator, count students into groups 1,2,3,4 alphabetically, etc.
 - Gender/race balance
 - Use one of above techniques and check that have equal numbers of men and women per group OR at least no isolated women or minorities (All female and all male groups ok; 2 males one female tend to result in female not talking much or being disregarded; Heller and Hollabaugh 1992).
- **Student controlled**
 - In class, let students form groups based on characteristics, traits, interests, or location of high school (all of these could potentially result in heterogeneous groups)
 - e.g. Form group of 4-5 people where at least 3 different high schools are represented, or form group of 4-5 people so that at least 3 different characteristics are represented (use list of character traits)
- **Student choice**
 - Whomever happens to be sitting next to you
 - In a large 1st year class, may end up being a relatively random distribution
 - In a class where people may already know each other, more likely to be based on existing friendships

Formal vs. Informal Group work

- **Formal** = students are graded on their group work; emphasis may be on sharing and learning, but also on creating a product that reflects significant work
- **Informal** = students are not graded; emphasis is on sharing ideas and learning from each other

Formal groups

- Group members need to feel accountable for individual work and participation, need to feel that each of their contributions is necessary
- Assigning group roles that rotate can help make sure every member has something important to do
- Group “contracts”—rules established by the group to determine how to handle out of class work, people who don’t participate, etc.

Informal groups

- Task should be complex so that there is a reason to talk to each other
- Task can be open ended or have more than one correct answer: it’s ok to be wrong or have a different idea
- Task should focus on generating reasoning and understanding through sharing ideas

Designing Group Activities: what to keep in mind

Costs of collaboration

Cognitive

Memory

Retrieval can be blocked when others are talking

Balance of complexity

Cannot be too difficult or too easy!

Balance of individual member competence and group competence

If individual can solve on own, little benefit seen from collaboration

Social

Loafing

Fear of evaluation

Accountability

Benefits of collaboration

Cognitive

Cue prior knowledge

Complementary knowledge

Increase working memory resources

Error correction

Relearning through retrieval

(see also Chi and Wiley 2014 table, below)

Social

Increased engagement

Joint management of attention

Construction of common ground (shared knowledge)

Negotiating multiple perspectives

(from Nokes-Malach et al. 2015)

Formal in-class group activities (suggestions)

Examples: tutorials, concept mapping, worksheet-driven activities, labs, etc.

- Activity should involve all students (develops teamwork skills).

- Activity should be challenging: where students work with ideas that are typically difficult to learn and the activity requires them to think about and debate these ideas with each other.

-Need course structure and space conducive to group work (4 per table works well). TA's with role of facilitating group discussion and Socratic teaching works well.

-Grading options include: only for participation, grading individual work, or grading collective work. Be explicit about why and how collaborative learning is beneficial. If grading collective work, need time and attention devoted to why and how to work in teams effectively, roles and responsibilities of team members, and evaluation of contributions as part of team. Rotating roles can be assigned.

(from CWSEI: "Group work in educational settings")

Assessing effectiveness of group activities

- **Promote group and individual incentives:** Use appropriate incentives for individual and group participation. Success of group should depend on individual success, and students must demonstrate individual accountability.
 - Possible incentives: points (extra credit or participation), treats, praise

- **Help teams develop mastery goals:** share data on the roles that team members are playing, to make them aware of team roles, ask students to individually identify their learning goals, and have teams show how they plan to address individual learning goals. This could be an assignment for points, or just an occasional check in.

- **Follow group work with individual accountability:**
 - **Clicker question on objective of group activity**
 - works to give both students and instructor immediate feedback on whether the group work has accomplished goal if individuals can answer the question correctly
 - **One-minute papers**
 - What have you learned? What is still confusing?
 - Single individual assessment question on topic: doesn't have to be graded, but answers can be scanned to see if students have learned the main objective of the group activity, and thus as a form of assessment of efficacy of the activity.

- **Self-report surveys (reflective)**
 - Ask reflective questions: do you THINK you learned from this activity, do you feel more comfortable with the material, are you ready to move on, ready to apply this knowledge, what else do you have questions about, etc.