EFFECTIVE USE OF GROUP WORK

This job aid describes the educational value and the ingredients of effective group learning. It contains many examples of group learning tasks.

This job aid will help you to:

- form productive learning groups
- select appropriate group learning tasks
- facilitate group learning
- evaluate group learning outcomes

net Includes techniques for online courses.

Why use learning groups?

Numerous studies have shown that the thoughtful use of group work brings about the following benefits to learners:

- higher academic achievement
- long term retention
- higher level of reasoning
- critical thinking
- teamwork skills
- interpersonal communication
- group problem-solving and decision-making
- conflict resolution
- improved racial/ethnic relations
- improved sexual difference relations
- higher self-esteem
- individual empowerment

Ingredients of effective group work

Positive interdependence

Group work is more productive when the participants perceive that they need each other to accomplish the assigned task. In other words, they "sink or swim together". There are various methods of instilling this atmosphere within a group. They involve highly structured activities in which each student is asked to take on one of a few specific roles.

Individual accountability

It should be clear that each member of a learning group is responsible for achieving all of the learning outcomes associated with an assignment. Students are made aware in advance of a group activity that their learning will be individually assessed or evaluated. This can be accomplished through the use of random oral questioning or quizzes and formal exams. If the overall group work is evaluated (often it is not), then this might only account for a small part of a student's grade.

Face-to-face interaction

Students in a learning group promote each other's productivity and learning through the use of sharing, help and encouragement. Student interaction is stimulated by appropriate seating arrangements and through the use of shared resources such as information handouts, worksheets, tools and equipment, etc.

net Online interaction

Whether you are teaching a face-to-face, blended, or fully online class, having students do group online work has several advantages. Depending on the technology used, online group work makes it possible for instructors to more easily monitor the groups, and provides a means to observe and evaluate the learning process.

As with face-to-face interaction, students in an online learning group promote each other's productivity and learning through the use of sharing, help and encouragement. Student interaction is stimulated by the use of technology appropriate to the activity, and through a clearly articulated process that takes into account that students may be learning at a distance and, therefore, constrained by time zones and personal and professional demands on their time. Group work can be highly successful online, but it is important to allow adequate time and structure when using group activities in online contexts.

A note about technologies:

At BCIT we support a variety of technologies that can be used for online group work sessions. The Learning and Teaching Centre can help you identify an appropriate solution.

Forming productive learning groups

Except for some tasks that involve pairs, a typical learning group consists of four students. This is large enough for various roles to be assumed, and it provides enough diverse perspectives on a topic or a problem at hand. Conversely, it is not so large as to easily allow individuals to fade away from involvement.

Balance and diversity

Learning groups work best when they are balanced in terms of their abilities and have members with varied characteristics. Ideally, group members have:

- various levels of prior achievement
- various levels of prior experience
- a gender mix
- an ethnic and linguistic mix
- various learning styles

net In an online distance learning context, it is important to consider the geographic locations of the students and their respective time zones, since these can affect how easily it will be for students to work together.

Who should choose the groups?

There are advantages and disadvantages to each method of selection.

	Balance and diversity	Student perception	Best suited for
Student-selected	Poor	Seems fair, but some can feel left out	Short, informal tasks
Randomly-selected	Fairly good but not guaranteed	Seems fair	Short to medium-term tasks
Instructor-selected	Very good	Can be prone to perceived instructor bias	Long-term tasks

Student roles in formal cooperative groups

One way to foster positive interdependence is for each member to assume a meaningful role. Clearly define the roles. Leave the students to choose roles; however, if a group is together for more than one formal task, ask participants to rotate roles. This allows each member to experience a variety of duties. Some roles are:

Facilitator

- Moderates team discussions
- Keeps the group on task
- Ensures equal involvement
- Ensures equal opportunities to learn, participate and earn respect

Recorder

- Distributes and hands in materials
- Completes worksheets, written assignments or summaries for oral reports

Reporter

- Summarizes the group's activities or conclusions
- Assists the recorder with writing worksheets and group reports

Timekeeper

- Keeps the group aware of time constraints
- Aids the facilitator in keeping the team on task
- Consults with other teams if needed
- Leaves the work area in good condition
- Fills in for an absent member if there is no fifth member

Wild card

- Fills in for an absent member

Group project roles

When a group project is assigned, the students break down the task into logical elements and divide the elements evenly among the members.

Roles in simulated work environments

In simulations of actual work environments, group members will usually assume real-life roles from the workplace.

What is the instructor's role with learning groups?

The use of learning groups should not replace direct instruction but rather supplement the instruction. The result is a balance of lecture and small group activities. As with direct instruction, it is the instructor's role in group learning to plan classroom, lab or shop activities, and assess or evaluate the learning outcomes.

net Online: Since group work is often a structured, graded activity in online learning, the instructor's role is to monitor the groups and ensure that they are staying on track, intervening when they appear to be going in the wrong direction.

During group activities, the instructor becomes a facilitator of learning rather than a deliverer of information. Proceed as outlined below.

Set the mood

- Provide a rationale for using group learning
- Discuss positive interaction skills
- Assign groups
- Use an ice-breaker activity

Describe the activity

- Be concise about the structure of the activity
- Describe student roles
- Provide a handout to describe more complex activities

Monitor the activity

- Fade from the focus, be unobtrusive
- Circulate but don't hover
- Provide assistance if a group doesn't clearly understand their duties
- Walk the room and monitor for positive interaction
- Give public praise for good interaction
- Intervene if a group's activity is not productive
- Signal when it's an appropriate time for a transition

Debrief

- Lead a discussion on the results from the activity
- Prompt for group self-assessment on the quality of interaction

Some group learning tasks

Choose an appropriate group learning task. It should be relevant to the course objectives and be complex enough to promote student interaction, but not too complex for the students' abilities.

Informal tasks

Informal tasks can occupy several minutes to one class period. Use them to take short breaks from direct teaching to do group work for the purpose of:

- setting a conducive learning environment
- setting lesson expectations
- focusing student attention on key material
- ensuring cognitive processing
- providing closure

net Informal tasks generally aren't used in fully online courses, whose activities require more structure and planning. Nonetheless, they can be integrated into "live online classroom" sessions.

Formal tasks

Formal tasks can occupy one class period to several weeks. Use them to give structure to any assignment or course requirement. Students are required to:

- organize material
- explain material
- summarize material
- integrate material into existing conceptual structures

Specific activities

Most of the activities summarized here are less formal and tend to be useful for instructors who are new to group learning. For more in-depth descriptions of these activities and for other activities, refer to publications in the resource list at the end of this job aid.

net Many of these activities can be adapted for online group work. How these are structured online depends on the type of technology used (e.g., live online classroom technology such as Elluminate Live® or asynchronous discussion forums) and whether the students are on-campus or distance learners. The Learning and Teaching Centre can help you adapt these activities for online group work.

Ice breaker activities

Ice breakers are used to help students feel at ease about contributing in a cooperative environment.

Name game

Arrange students in a circle and have the first student state his or her name. The second student says his or her name and the name of the first student. The third student says his or her name and the names of the previous two students. This carries on until everyone has had a turn. This can be done at the beginning of the first few meetings to reinforce the recall of names and to give the chance for everyone to learn names.

Scavenger hunt

Hand out a list of skills or characteristics that students may have. These might include being involved in a sport, playing a musical instrument or having a part-time job. The students circulate and write names by the relevant characteristics.

Discussion activities

Think-pair-share

This is a simple, low risk activity. Instructors ask the students a thought-provoking question. The students are given a minute or two to think of a response. This quiet time is essential to the activity, so it should not be rushed. Then the students discuss their responses in pairs. After this they share the responses with the entire class. This final phase takes the longest time, so it is often limited to a few responses. It is also the least valuable in terms of learning, so sometimes it is not included at all.

This activity tends to elicit more thoughtful responses from students because they have the opportunity to discuss them in a low-risk situation before speaking to the whole class.

Talking chips

Each student in a small discussion group is given the same number of tokens (three to five). Whenever a member contributes to the discussion, he or she places a token on the table in view of the others. The discussion is over when all of the chips are used. They can also be re-used if another round of discussion is needed.

This activity is used when it is noted that some students take over discussions and others don't participate. It allows even participation and gives time for all members to reflect.

Problem-solving activities

Think-Aloud Pair Problem-Solving (TAPPS)

Student pairs are given a set of problems to solve. They take turns as problem-solver and listener. One student solves the first problem by talking through the reasoning process out loud. The other listens and tries to understand the reasoning and provides suggestions if needed. Then they switch roles for the next problem and alternate from then on.

TAPPS promotes analytical skills and deeper understanding.

Send-a-problem

The instructor prepares a number of challenging problems so that each group in the class can start with one. Each problem is written on the outside of an envelope. In the first phase, each group finds a solution to their problem, places the solution in the envelope, and passes the problem and solution to another group. Without looking at the first group's solution, the next group solves the problem and places their solution in the envelope. The problems can be passed on as many times as seems useful. In the second phase, the final groups review the responses, evaluate them and report their findings.

The first phase allows students to learn from each other's thinking skills and the second phase helps students learn to weigh the merits of multiple solutions.

Reciprocal peer teaching activities

Note-taking pairs

After a lecture, reading assignment or other learning activity, student pairs compare and work together to improve each other's notes. They help to identify missing or incorrect points. Each member must take something from the other. Their merged records are more accurate and complete than either set of individual notes. If the activity is used after a lecture, the students should first be given some time to reflect on the new material.

This activity helps students to improve their note-taking skills.

Reciprocal peer tutoring

Students are asked to individually make up a set of questions regarding a reading assignment or other learning activity. Then they form random pairs. Student A asks a question and student B answers. If the answer is not correct or complete, student A probes and offers hints until the correct answer is given. Then they reverse roles and alternate until all the questions are addressed. The pairs can be kept together for long durations. The activity is often used as a review before examinations.

Reciprocal peer tutoring gives an opportunity to think analytically and to use the language of the discipline. It acts as a motivator and fosters deeper thinking.

Jigsaw

Students work in groups and each group masters a different topic. These "expert" groups break up and form "jigsaw" groups. Each of the jigsaw groups includes one or more students from each specialty. They then take turns to teach their expertise to the others. The expert groups must first become very familiar with the material and then discuss and decide on strategies for teaching it to the others. The instructor may ask them to summarize and report their plans before forming the jigsaw groups. The activity can also be used to address different perspectives of a single complex problem or issue.

Jigsaw motivates students to learn their topic in great depth. It also gives the opportunity to enhance communication skills.

Writing activities

Round table

Students in small groups take turns responding to a prompt from the instructor. The prompt might be "List some devices that use electromagnetism", or "Which topics from this class are not clear to you?" One student from each group writes a few words or sentences and then reads them aloud before passing the paper on to the next member in the group to add to the response. The resulting responses can be used for whole-class discussions or they can be a form of feedback to the instructor.

The activity provides a record of responses and it allows students some quiet time to focus their attention.

Dyadic essays

After a lecture, reading assignment or other learning activity, the students individually devise and write an essay question on the topic. The question might be "Describe and compare the conditions needed for alpha and beta-amylase enzymes to break down complex carbohydrates in barley grains". Students also write short model essay answers to their questions. During the next class they form pairs and exchange the questions. Each member answers his or her partner's question and then they trade answers and compare them.

This activity gives learners practice in distinguishing key points in presented material, and it allows them to clearly express answers. It also provides model responses with which to compare their answers. Instructors sometimes make use of the students' essay questions in exams or practice exams.

Shop or laboratory activities

Troubleshooting practice using TAPPS

The Think-Aloud Pair Problem-Solving activity, already outlined under the heading "Problem-solving activities", can also be used to improve learners' troubleshooting skills. When faced with a fault in a real or simulated device in the laboratory or shop, pairs of students take on the roles of problem-solver and monitor. The problem-solver talks through the complete troubleshooting process by saying everything he or she is thinking and doing while troubleshooting the fault. The monitor reminds the problem-solver to keep talking, and sometimes asks for clarification of his or her actions or decisions. The monitor is careful not to find the fault. After the fault is solved, the pair debriefs each other on the procedures that were used. They switch roles for the next fault and alternate thereafter.

Verbalizing the troubleshooting process fosters more entrenched skills for future use. Pair cooperation allows students to be exposed to other methods of reasoning.

Cooperative laboratory or shop project

A small group of students takes on the task of designing and/or constructing a product. A leader is chosen. The task may be divided into logical portions and assigned to individual members of the group. The duration of the project may be days or weeks. Members report back to the group about their progress and any difficulties encountered. The final product is presented to the whole class, and individual members must be prepared to answer probing questions about it from other students and the instructor. Usually a written group report on individual contributions will also be required.

Students gain valuable team project skills. When compared to individual project work, small-group cooperation generates fewer projects from a class. However, the projects are generally more sophisticated.

Cooperation and competition

With both activities below, students in small groups help each other study some presented material. The groups then compete to earn points. The competition is structured in ways that give opportunities for all to succeed. The points are used as a team reward, not for formal evaluation. The instructor should only grant points to students; deducting points for poor achievement is counterproductive.

The most important part of the activity is the time spent helping each other study the material. The competition is used mainly as a motivator for this cooperation. To work as a motivator, the planned competition phase must be clearly explained to the students before the group activity takes place.

Besides serving as strong learning motivators, these activities expose learners to other ways of thinking and learning.

Team Games Tournaments (TGT)

Students are placed in study groups of four. These groups are usually together for a long duration and are balanced based on previous achievement, i.e., consisting of a high achiever, a low achiever and two middle achievers. Information is presented to the whole class. The students in each group help each other study the material in preparation for the tournament.

The tournament consists of an academic game played at different tables, pitting students of equal ability against one another. Students are placed in groups of four with others of similar previous achievement. For example, high achievers are placed with other high achievers and middle achievers are placed with other middle achievers. It must be assured that a student is not placed with another member of his or her original study group. The game is based on questions that relate to course outcomes. Each member earns points for their study group based on how they placed at the tournament table. The structure of the game and information about the assignment of points can be obtained from Slavin (1994).

Student Teams Achievement Divisions (STAD)

This activity is similar to TGT except that the games are replaced by quizzes. It is easy to integrate into an existing course, especially if quizzes have already been devised. The members of each study group work together to prepare each other for a quiz. Students write it individually. A member brings points to the group based on his or her improvement compared to previously written quizzes. Again, Slavin (1994) provides a complete description of this technique including a set of criteria for earning points.

Evaluating group learning outcomes

Individual accountability

Two of the most common concerns about group work are that:

- a student's mark can be pulled down by others in the group, or
- a student may be awarded a high mark mainly due to the achievement of others

These concerns arise especially during formal tasks. When a project, a several-page report or an essay is evaluated, a student's final grade should reflect his or her own achievement. But how is this ensured when students work in groups? When group learning tasks are effective, they promote interdependence through their built-in structure and by the use of individual student roles. This tends to alleviate issues of under-contribution or over-contribution by individual members. The instructor can also use random oral questioning, quizzes and formal exams to achieve individual evaluation.

Assessment vs. formal evaluation

Many group learning activities such as discussions and peer teaching are used solely for learning and assessment purposes. To assess means to take a "snapshot" measure of the students' progress towards the learning outcomes without assigning formal grades. The purpose of assessment is to identify any necessary remediation before formal evaluation takes place.

The following table shows a continuum of informal to formal tasks and their suggested treatment. Note that direct evaluation occurs only with formal tasks.

	Task types	Tangible products	Evaluation
Informal tasks	Discussion and peer teaching	None	Use for learning purposes Do not evaluate directly
	Short-term problem-solving, writing and shop/lab tasks	Short reports, worksheets, etc.	Use for learning and/or assessment Do not evaluate directly Award group points (optional)
Formal tasks	Longer-term writing or shop/lab tasks	Projects, several-page reports, essays	Use instructor and/or peer monitoring to evaluate individual contributions Ask individual students probing questions on a random basis

Meaningful and explicit marking guidelines

Evaluation of student learning should be closely related to the course outcomes. This gives students the message that the assigned tasks are meaningful and not just "busy work". Give the students a clear marking scheme in advance. When the scheme includes individual accountability, conscientious students will feel more in control of their own destiny. Others are made aware that there are no free rides.

Some group learning resources

The first and fourth listed books below and all of the videos are available in the BCIT Library.

Books

Collaborative Learning Techniques: A Handbook for College Faculty

Barkley, Cross and Major (2005)
This is a very practical and up-to-date cooperative learning handbook. It covers all stages of the method from orienting students to grading and evaluating their achievements. Each section includes tips for use in online learning. Perhaps its most valuable feature is a set of 30 types of techniques. Each one is elaborately described along with good examples.

Cooperative Learning for Higher Education Faculty

Barbara J. Millis and Philip G. Cotell, Jr. (1998)
This is a very thorough and well-organized work that brings together research and practical insights on cooperative learning. It includes a lengthy section on techniques from various sources.

Practical Guide to Cooperative Learning

Robert E. Slavin (1994)
Slavin emphasizes techniques that include competition between cooperative teams.

Active Learning: Cooperation in the College Classroom

Johnson, Johnson and Smith (1998)
The Johnson brothers provide a thorough and inspiring account of cooperative learning. Although not well organized, this book is brimming with practical techniques.

Videos

Learning Together, Working Together: Cooperative Learning in Post Secondary Education

This is a short and to the point overview of cooperative learning. It starts with a few testimonials by instructors. Then it goes right into the five main characteristics. Each one is described along with how it can be achieved, and some class examples are shown.

Positive Interdependence: The Heart of Cooperative Learning

Examines positive interdependence and explains how to use it in structuring group lessons. A workbook is included. It starts with examples with children but progresses to examples with young adults and some trades programs. There is also a pep talk about cooperation.

Teaching Teams that Work

This BCIT production includes student and faculty handbooks. This video focuses on discussing and fostering cooperative skills.

Busy, Noisy and Powerfully Effective: Cooperative Learning in the College Classroom

Visits three college classes to observe the process in use and records several college professors who use cooperative learning in their classrooms. Includes a good discussion on what is meant by learner-centred instruction and a short discussion on how teachers enjoy teaching more when using cooperative learning.