Teaching Supplement

Critical Thinking and Small Group Activities

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Abstract: I mention the benefits, challenges, and costs of using small group activities to enhance our students' learning of critical thinking skills in our courses, and then describe ten examples of these groups. Two of these examples are not commonly reported in the literature on small groups, so I describe them in greater detail to facilitate their use in our courses.

Résumé: Je mentionne les bénéfices, les défis et les coûts d'employer des activités de petit groupe pour améliorer l'apprentissage de la pensée critique de nos étudiant(e)s dans nos cours, et ensuite je décris dix exemples de ces groupes. Deux de ceux-ci ne sont pas couramment mentionnés dans la littérature sur des petits groupes, alors je les décris en détail pour faciliter leur usage dans nos cours.

Keywords: think-pair share, snowballing/pyramid, buzz group, learning group, teaching group, role-playing, role-reversal, fishbowl/inner circle, collaborative conceptual analysis, thinking aloud in pairs, metacognition.

1. Benefits

There are many **benefits** to using small groups activities, *when they are directed by clear tasks and appropriate rules*. They enhance students' learning in many ways. When teaching a skills course, such as critical thinking, they get all the students involved, and give each one of them an opportunity to practice the skills taught, and to offer and receive feedback, which help to improve their self-awareness about their thinking (i.e., their metacognition). They socialize students into the values, standards, vocabulary, and methods of a discipline. They also contribute to students' personal growth: they help to increase their self-confidence, improve their listening, self-control, and collaborative skills, and broaden their perspectives on interpreting and applying the material or skills taught. We learn best by doing, and if we combine writing and conversations focused on the matter and skills to be learned, we increase students' chances of deepening their learning. Small groups activities can

help to wake up students out of their passivity. And since we don't know whether we understand something until we can apply it, small group activities on a well-chosen task help instructors (and students) to determine whether or not students understand the material taught.

2. Challenges

There are some ***challenges*** to using small group activities. (1) Sometimes the blind will lead the blind, which will reinforce incorrect reasoning or misunderstanding of the material taught. In order to avoid such consequences, a *class* discussion *should* follow these small group activities to help students become aware of *what* and *how* they were thinking, and determine whether they were correct or mistaken. (2) Some groups will not follow the assigned task. This is why we instructors must walk around the class and monitor the group performances. (3) Some students will dominate their group, thereby diminish the learning opportunities of others (and themselves) in the group, and probably increase tensions. To avoid those negative consequences we can give some group guidelines before assigning each activity. A proper monitoring of the groups as they are working can help us to identify the dominant students; and after class—not in from of other students—we can ask them to reflect (according to the given guidelines) on their behavior in the group, and on the consequences of their behavior on their group. Usually this helps them to modify their behavior. If we notice that their dominating habit is difficult to break, we could form a group of only dominating students, in which it may also be necessary for us to participate. (4) In some groups all the students will be quiet: in such cases I join in the group and temporarily guide them to begin the assigned activity. (5) Of course students in each group will have different levels of comprehension and mastery of the material. In order to diminish the boredom of the more advanced students, all students are informed by the group guidelines that if they already have some mastery of the material, they should put themselves in the position of those who are not learning as quickly to find an effective way to help them learn. (6) Some group activities can become just busy work. *In order to avoid this problem, we must make sure that we have goals worth reaching, that our students understand these goals well, that we evaluate how well students reached those goals, and that we identify some of the causes if the final learning outcome of the activity is not satisfactory.*

3. Costs

There are some ***costs*** to using small group activities that we must always consider before deciding to use these pedagogical tools. (1)

The principal cost is that it takes time away from the material to be covered. If our goal is to maximize students' learning, we must keep in mind that the depth and breadth of their learning is not necessarily proportional to the quantity of material that we cover. Sometimes they will retain more material and skills if they have a chance to apply them than if we simply cover more material and skills. (2) For the instructors who are traditional lecturers (which is seriously inappropriate for the teaching of critical thinking) the setting, small group activities can be stressful: the class can appear out of control, especially if everyone is actively engaged in his/her group. If this describes your concerns, then I suggest that you carefully plan when and where in your class you will use a small group activity; and do only a few per week at most.

Small group activities are not a break for us. For we must monitor carefully how they are proceeding; get involved with the specific groups that need help; note the kinds of issues coming up in different groups that should be discussed as a class if they are not brought up by any group during the whole class discussion; and assess their effectiveness in helping us to reach our goals.

4. Activities

The group activity that I use the most often is the think-pair-share group because it can be used very quickly whenever an issue arises that would benefit all students if each one had the opportunity to think about the issue and to apply some of the material taught. It also helps to monitor quickly students' understanding of the material taught. Another advantage is that it is easy for the shy students to speak their minds when communicating to just one student; and after that interaction they sometimes have the confidence to address the whole class.

(A) Think-Pair-Share

1. Students write their answer to a question on their own. [**Give sufficient wait-time!**]
2. They pair-up.
3. They share their answers AND their reasoning leading to those answers.
4. They reason their way to a consensus on which is the better answer.

Whenever applying reasoning skills on issues that would benefit from many perspectives, then the next activity is beneficial:

(B) Snowballing/Pyramid

1. Students write their answer to a question on their own.
2. They pair-up.
3. They share their answers AND reasoning leading to those answers.
4. They reason their way to a consensus on which is the better answer. (These first four steps are identical to Think-Pair-Share.)
5. The pair joins with another pair.
6. They share their answers AND reasoning leading to those answers.
7. They reason their way to a consensus on which is the better answer. ETC.

(C) Buzz Groups

1. Two to six students.
2. They are given a clear task—with clear directives—that clearly relates to the class material.
3. A time limit is set; and the instructor reminds the class of the remaining time as the activity progresses.
4. A student records the group's results (AND its reasoning: how they arrived at their conclusions).
5. After this student reports to the whole class, we can ask the other members of the group whether there is anything they would like to add or change to the report.
6. The whole class evaluates the content of each report.

One of the best ways to learn something is to teach it. And so, the more often we can put our students into teaching roles, the more we enhance their learning. The following group activities put students into such roles:

(D) Learning Groups

1. Two or more students.
2. They read the **same** material and answer the same questions on their own.
3. Discuss their answers with the members of their group.
4. Determine who has the best answer for each question, and justify their decision.

(E) Teaching Groups

1. Two or more students.
2. They read **different** materials that relate to the main objectives of the class (or course).
3. Each one then explains the material to the members of their group.
4. The group collaborates to apply what has been learned by answering some questions from the instructor.

We must not forget the debate as a small group activity, but here I just want to illustrate a simple variation on the common debate format.

(F) Debate

1. Pick a controversial topic.
2. Create *more than two* sides/perspectives in order to help students explore the complexity of the issue.
3. In order to make students *listen well* to the different perspectives or different opposing positions, and cooperate rather than compete, make sure that the participants will also be evaluated on their ability to reconstruct accurately and evaluate fairly the opposing views.

The ability to put ourselves in the position of someone helps us to understand better the arguments advanced by him/her. The following activities, when well designed and modeled by an instructor, train students to develop that mental agility:

(G) Role-Playing and Simulation

This helps students to feel what it's like to be in the other's position. The roles are chosen to reproduce or simulate some role in the real world (e.g., jury, terrorist group) in order to apply the ideas of the subject to a concrete situation, and to facilitate understanding the real world "actors". It can feel artificial at first, until students get into the roles. In order to address the fear of acting in front of the whole class, the role-playing can occur in the small groups. Instructors should usually first model the activity to their students.

(H) Role Reversal on Key/Cherished Issues

This activity is particularly important because most of us attach ourselves too much to our ideas, or over-identify with

them. For instance, identify the conservatives and liberals in class, and have them support *as genuinely as possible* the position they actually oppose; the winner will be the group that offers the best arguments.

The following activity can improve students' awareness of their own reasoning and behavior by observing others doing what they themselves sometimes do. If done correctly and often enough, the fishbowl technique gives students a model that helps them to observe themselves as they are performing some task:

(I) Fishbowl or Inner Circle Group

1. A few volunteers agree to interact in an inner circle.
2. They are given a clear task, with clear directives, that clearly relates to the class material.
3. The rest of the group must actively listen and take notes. Once the inner group is finished, the other students must add to the discussion of the inner group, make corrections, and comment on the group dynamics. This can be done either as a whole class or in small groups. If there is more than one group having a fishbowl, then the observing students become members of the fishbowl, and each member of the fishbowl either becomes an observer in his/her group or in a *different* one. There should typically be a class discussion after the small group discussions.

The following technique can take some time, but if first carefully modeled by an instructor, and then properly guided, is *very* good in helping students to tap into their experience and improve their application of some important reasoning tools:

(J) Collaborative Conceptual Analysis

1. The group decides on the question to be answered. It will usually have the form, "What is X?", where "X" can be success, justice, freedom, faith, time, space, open-mindedness, etc. Most of us would not be able to give an adequate definition of any one of these concepts, but we would very likely be able to give a *clear detailed example*.
2. Each participant writes in detail **genuine** [obvious, evident, clear]**,** *contrary* [opposite]**, and borderline/margina**l examples of X. Borderline/marginal examples of X are close to being an X but are not precisely an X.
3**.** Each participant shares his/her *best genuine* example with the group.

4. The group chooses the best genuine example among those proposed.

5. The group uses the best genuine example to answer two sets of questions:

   (a) *What are the properties present in this example that are together sufficient for this example to be a genuine X?* The members of the group will use counterexamples to test the **sufficiency** of any proposed set of properties. This discussion will lead to a claim having the form, *IF something has properties a, b, c, etc., THEN that something is a genuine X.*

   (b) *The absence of which properties currently present in this genuine example would make it cease to be a genuine X?* OR *Which property, when taken away (in our imagination) from this example, would change it into something that is not a genuine X?* In other words, *What are the properties in this example that are individually necessary for this example to a genuine X?* The group will use counterexamples to test the **necessity** of any proposed property. The discussion will lead to a claim having the form, *IF something is a genuine X, THEN that something has properties a, b, c, etc.*

6. If a participant has written any contrary examples, then s/he shares his/her *best* example (i.e., something contrary/opposite to X) with the group. If no one proposes any contrary example to the group, then the group goes to step (9).

7. The group chooses the best contrary example among those proposed.

8. The group uses the contrary example to answer two sets of questions:

   (a) *Which properties, if **added** (in our imagination) to the present properties of this contrary example, would change it into a genuine X?* The correct answer to this question will either identify additional properties that are part of the sufficient condition for being an X, or confirm that some of the properties identified in step (5a) are part of that sufficient condition.

   (b) *This contrary example of X is not a genuine X because it is **missing** which properties?* The correct answer to this question will either identify additional properties that are part of the necessary condition for being an X, or confirm that some of the properties identified in steps (5b) are part of that necessary condition.

9. If a participant has written any borderline/marginal examples, then s/he shares his/her *best* example with the group.

If no one proposes any borderline/contrary example to the group, then the group goes to step (12).

10. The group chooses the best borderline/marginal example.
11. The group uses the best borderline/marginal example to answer two questions:

(a) *Which properties, if **added** (in our imagination) to the present properties of this borderline/marginal example, would change it into a genuine X?* The correct answer to this question will either identify additional properties that are part of the sufficient condition for being an X, or confirm that some of the properties identified in steps (5a) and (8a) are part of that sufficient condition.

(b) *This marginal/borderline example of X is not a genuine X because it is **missing** which properties?* The correct answer to this question will either identify additional properties that are part of the necessary condition for being an X, or confirm that some of the properties identified in steps (5b) and (8b) are part of that necessary condition.

12. From the identification of the properties forming sufficient and necessary conditions gathered at steps (5), (8), and (11), the group proposes a definition of "X":

X $=_{def}$ (general classification of X) & properties that together (with the general classification) *identify all and only real and logically possible genuine X's*.

13. The group uses all the other examples of *each* participant to test the adequacy of the definition i.e., to test the necessary and sufficient conditions. Everyone still contributes. Together they modify the definition as much as is necessary to take into account all genuine, contrary, and borderline marginal examples of all the participants.

14. The members of the group consider additional examples, and use their *imagination* and knowledge to invent counterexamples against the definition, and together modify it accordingly.

The next technique is *very* good for helping students to improve their metacognitive skills:

(K) Thinking Aloud in Pairs

Justification of this approach

The ability to reason well is a skill. It is learned or improved by (a) proper demonstrations and modeling to the students, and (b) constructive feedback to the students' *complete* reasoning. Tradi-

tional feedback is limited to graded assignments, papers, and tests. If any of these forms of assessment omit the evaluation of the complete reasoning of a student in performing a task (e.g., multiple choices, true/false, fill in the blank, matching), then the feedback will be *very* limited. Just because a student gets a right answer does not mean that s/he reasoned correctly; and just because he got it wrong does not imply that s/he reasoned incorrectly, for s/he could have used a false assumption or incomplete information.

If feedback is given mainly on the final product without addressing the complete reasoning that leads to the final product, then there is a risk that the student will not make the necessary corrections at that deeper level. Hence, the feedback will not have the corrective effect instructors would like it to have. One important benefit of this thinking-aloud-in-pairs activity is that it helps students to receive feedback at the level that is too often neglected.

There is a second valuable benefit. We don't know how we are really thinking until we write it out or vocalize it to ourselves or to others. The thinking aloud approach helps students to become more aware of their own reasoning, and to monitor it more closely, and eventually (*assuming proper modeling and practice throughout the course*) to correct themselves. This self-monitoring and self-correcting is sometimes labeled "*metacognition*". With sufficient proper practice students will internalize this dialogue by mentally vocalizing and correcting their own reasoning in other areas of their lives.

Procedure

1. The instructor models the correct thinking aloud on a particular task: s/he thinks aloud, expresses what s/he is doing mentally while accomplishing that task so that the students may observe his/her way of applying various principles or standards, and correcting him/herself as s/he performs the task. There must be explicit standards of reasoning (clarity, precision, accuracy, relevance, logic, depth, breadth), otherwise some paired students could simply be reinforcing their own bad habits of reasoning.
2. Students pair up.
3. For the first round, one student is the thinker, and the other is the listener.
4. The student who is playing ***the role of the thinker*** thinks aloud while performing a task similar to the one modeled by the instructor, in order to expose his/her own thinking. The thinkers must *completely* vocalize their thinking as they work through the task, even when they stop (to re-examine, backtrack, reflect on the meaning of an unfamiliar word, decipher complex sentences, communicate that

they have lost their flow of thought, express an emotion, etc.). If the reasoning is completely vocalized, and thus completely "observable," the listener (or monitoring instructor) is able to offer feedback that identifies any mistakes in reasoning at the instant that it occurs.

5. **Role of the listener**:

(1) S/he must continually check the clarity, accuracy, and logic of the vocalized thinking, and point out the errors whenever they occur.

(a) The listener must carefully follow each step of the vocal thinker,

(b) The listener must make sure s/he understands each step of the thinker: it must be clear in the listener's mind where the thinker is coming from, and where s/he is going, even when the thinker's goal is just to explore or grope aloud.

(c) The listener can ask the thinker to slow down or even to stop in order that s/he catch up with the thinker and gather his/her own thoughts, or even paraphrase what the thinker has just said to verify that s/he is correctly grasping what the thinker is vocalizing.

(d) The listener must evaluate each step of the thinker.

(e) The listener should *not* work through a task independently of the thinker: the listener's task is to listen, ask questions of clarification, evaluate the thinker's reasoning, ask evaluative questions.

(f) If the listener spots a mistake or weakness, s/he should only point it out, and *not* correct it. If there are steps to follow in the task, the listener must check every step taken and every conclusion reached by the thinker; s/he should *never* let the thinker go to the next step until the preceding one is correctly completed.

(g) If the listener sees the answer or conclusion before the thinker, s/he should *not* provide it, but must let the thinker work it through.

(h) If the thinker gets stuck, the listener *may suggest* the next step, or one of the next steps if there are options.

(2) The listener must demand *constant* and *complete* vocalizations of the thinker's thinking.

6. **Role of the instructor**: S/he walks among the pairs of students; listens to the thinkers' vocalizations. The instructor will interrupt a group, and ask the listener to repeat what the vocalizing student has been saying; s/he will ask the thinker to confirm the listener's report. This will be done randomly to at least a few groups. At this stage the instructor interacts only with the specific pairs of students. If s/he notices some mistakes, s/he should make a mental note of them, especially if they occur in more than one

group. Instructor's goals: (a) make sure that the listeners are truly listening, and not just going through the motions; (b) determine whether students are thinking the way they should be thinking on the assigned task; (c) take note of different correct approaches; (d) take note of recurring mistakes in reasoning.

7. The roles are reversed: now the thinker becomes the listener, and the listener becomes the thinker. A similar task is given to the new thinker.
8. Role of the instructor: same as (6).
9. After both students have played the two roles, the instructor can (a) describe some of the recurring weaknesses or strengths noticed; (b) have the whole class reflect on the different approaches that different groups have used, the difficulties they have had, or on how differently or similarly they would do the task again….

I'll end with a well known activity:

(L) Brain Storming

1. Students "storm" a problem with ideas: any and all ideas are accepted: insane and wild ideas are encouraged because they may break up mental blocks, and may lead to more practical ideas.
2. No criticism is allowed of the students' contributions. Ideas may be criticized **only after** the brain storming session.
3. Someone writes down the ideas.
4. Summaries are read to the class.
5. The class evaluates the content of each summary.

I am inviting you—along with your colleagues—to brain storm ways to modify the preceding examples into ones that will further maximize the depth and breadth of your students' learning, or to brain storm where and when you could effectively use these group activities in your courses.

References

Except for examples (J) and (K), all the activities were adapted from Richard G, Tiberius, *Small Group Teaching: A Trouble-Shooting Guide*, Toronto: Ontario Institute for Studies in Education, 1990.

Example (J) is a serious modification of simpler instructions from *Plato, not Prozac!* Lou Marinoff, New York: Harper Collins, 1999, pp. 262-264.

Example (K) is a serious modification of simpler instructions from Arthur Whimbey & Jack Lochhead, *Problem Solving & Comprehension*, Hillsdale, New Jersey: Lawrence Erlbaum & Associates, 1991.