



Working in Groups — Understanding but not Applying

*By Tena Long Golding and the editor
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The editor: *It's the end of the semester, the time when I get grumpy and start thinking expectantly about the new students I will meet in January. But last week I moved from grumpy to downright displeased as I observed my students who've been studying group dynamics since September work together on a project where they interview fellow classmates for hypothetical job positions. I listened to one group as they brainstormed possible questions. One male in the group suggested they ask candidates if they were "Eagles" football fans — not a peep from anybody else in the group as to the relevance of the question or how it just might be a bit gender biased. It was duly added to the list. The assignment had "candidates" interviewed on two separate days but at the beginning of day two one group had their report done. They'd already decided on whom to hire despite the fact they still had three more interviews to conduct!*

All semester I've been struggling with these students on the constructive role of conflict in groups. They know I'm in favor of it. They can correctly answer multiple-choice questions about what it contributes. They can even tell me when it wasn't present in their groups, although they still see that as basically beneficially. "We got along really well and respected all opinions. Everybody agreed with the decision — we didn't need conflict," one group member wrote in a reaction paper.

With these experiences at the forefront of my thinking, I connected immediately with this article prepared for the newsletter.

Tena: I wanted my future secondary math teachers to learn how important it is to apply what you know about teaching to how you teach. I assigned them a reading

on cooperative learning. When they arrived in class I put them in groups and gave them 15 minutes to prepare a PowerPoint presentation that summarized the reading. I wondered if they would model in those groups what they had read and were to present.

The editor: *I love the audacity of this assignment!*

Tena: I didn't have to wonder long. Students did their usual divide and conquer with a section of reading being assigned to each student who prepared bullets for a PowerPoint slide and owned that content when it came time to present.

After their presentations I used a series of questions to move students from the presentation product to the processes they used: "You all talked about teamwork in your presentations. Was it reflected in how your group functioned? If not, why not?" "Describe group consensus and individual compromise as they relate to what happened in your group." "What was my objective in assigning this task?" I even had them rate how well they had "modeled" cooperative learning in their interactions.

What my students wrote in responses to those questions revealed that they knew very well that what had happened in their groups didn't model the processes they'd been assigned to read and present. Most rated how well they modeled the processes below five on a 10-point scale, and pointed comments like this occurred regularly in the written feedback they provided. "I think it was an individual effort because each person got to choose what they thought was important. The team didn't decide together ... what was important."

From my viewpoint, the activity was very successful. Students learned about cooperative learning both from reading and presenting. Even more importantly, they learned a lesson every teacher needs to know. Students can "know" the material and still not "do" what they know.

The editor: *Clearly, the first step to making group processes more effective involves a recognizing when they are not. I plan to use Tena's approach next semester and start by having groups read and report on how groups function best. It strikes me as one of those very constructive in-your-face kind of activities.*

But that still leaves the application step. How do I get my students to step up to the plate and do what they know the group needs done? In one of my other assignments students provide constructive feedback to a problem employee via an evaluation letter. They write those individually first and then in groups use their individual letters to create a group letter (that is hopefully better than their individual ones). One group this semester selected a very mediocre letter and submitted it as their group letter almost without

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- Keep the article short; generally between 2 and 3 double-spaced pages.
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Don't Over Look Community College Faculty's Contributions to Teaching

Did you know that almost the same number of students attend community colleges as attend four-year institutions? But hang around higher education and you quickly discover that it's a very hierarchical system. Community colleges, their students, and faculty routinely end up on the bottom of the ladder. In many professional organizations, publications and disciplines, this large faculty cohort is all but invisible. Are they really that second-class?

It is true that job requirements for faculty at two- and four-year institutions are not the same. Crow (reference below) notes some of the significant differences. Community college faculty have heavier teacher loads. They teach more and with even less support than four-year faculty. At community colleges or junior colleges (note how even the name diminishes their status) there is no expectation for scholarship and no rewards if it's done.

"There seems to be no understanding that science faculty [could be said of all faculty] need a special blend of subject matter renewal and pedagogical scholarship," Crow writes. (p. 54)

Currently there is a decrease in funding for professional development across higher education, but cuts have been deeper for community college faculty. They attend professional meetings far less frequently than colleagues at four-year institutions. These organizational issues make it more difficult for community college faculty to stay fresh and vibrant in the classroom, although one would be hard pressed to document that energy and motivation are any less present in community college classrooms those at four-year institutions. But do these differences in job requirements and working conditions justify second-class treatment for community college faculty?

The issue is actually one of respect exacerbated by the fact that faculty (like everyone else in higher education) tend to

be pretty status conscious and hierarchical in their thinking about credentials. Fewer faculty in community colleges have terminal degrees, which raises questions about their qualifications even though most faculty with Ph.D.s would readily admit that this content credential does little to ensure instructional success, especially with beginning students taking introductory courses.

Crow makes an even bolder claim, again in the context of science teaching. "Community college science faculty [we'd say community college faculty in general] are some of the most creative and dynamic science faculty in higher education. They reach out to a more diverse student population and lay the groundwork for the scientific future of the general population." (p. 55) When it comes to teaching at-risk, entering students, our community college colleagues ought to be the first experts we consult. They are succeeding with the most challenging of today's college students.

Teaching expertise, instructional innovation, and pedagogical scholarship can be found in all fields, at every career stage, and at all the different kinds of institutions that make up North American higher education. We need to look for it everywhere and value it wherever we find it. The classroom is a great equalizer. It does not matter if that place of learning is a big university, a selective private institution, or a "junior" college. When the door shuts and it's time to begin, we all stand there alone and with the same goal: make something happen with content and for students.

Reference: Crow, L. (2003). The sleeping giant: Where are the community college faculty? *Journal of College Science Teaching*, November, 54-55. ♥

10 ‘Worthwhile Considerations’ for Improving Lectures

“Is *The Teaching Professor* anti-lecture?” the sharply worded e-mail queried. “No, we aren’t,” I replied, “We’re anti poor lectures ... just like we’re against group work that doesn’t work and any other instructional approach poorly executed.”

But the note did remind me that we haven’t provided much on lectures recently, and in all the classrooms I visited this semester, lectures were certainly alive and well (although some were not very healthy). My search for current resources uncovered the article referenced below, which identifies 10 “worthwhile considerations” that should be addressed by those who lecture. The author teaches in a science area and pulls examples from that content.

1. **Active Student Involvement** — “Sitting for an hour and taking in new information is difficult, even for the most internally motivated college student.” (p. 454) Interactive components need to be present in all lectures, even those delivered to 500 students.
2. **Relevance** — Students taking large introductory courses (like history, business, or journalism students enrolled in biology) often do not understand why they need to know the Krebs cycle or phases of meiosis. Instructors need to start by asking themselves hard questions about relevance. If the content is relevant (meaning this is something non-science majors really need to know), that relevance must be made explicit. To those outside the discipline it is not generally obvious.
3. **Interest** — It is difficult to hold students’ attention for an entire lecture. Don’t underestimate how difficult it is. Use various strategies to support your efforts to do so. Maybe you can wear costumes or use props, but if that isn’t your style, opt for interesting facts and intriguing details. The author of this article describes for students the “party animal” behavior of Pacific squid who gather in large groups and who, after several bouts of mating and egg laying, all die.
4. **Expert/Novice Difference** — We all know who’s the expert and who’s the novice in the classroom, but what the experts often fail to realize is that students process course content at different rates and in different ways. What helps all learners process new information is linking it to what they already know, connecting abstract concepts to more concrete ideas, and moving from simple facts to more complex generalizations.
5. **Cognitive Overload** — Information-dense lectures lead to cognitive overload. Students’ minds shut down and their eyes glaze over. If you continue, you are proceeding without them. Stop — provide a brief review; take time for a question; and position the material that’s about to come in relation to what’s just been presented.
6. **Scientific Jargon** — Science is not the only field with lots of jargon — this applies to every discipline. Sometimes it’s both a new word and a new concept. When you’re learning French and you’re introduced to the word *chat* when you find out it means cat at least you know what it refers to. But when it’s *cytokinesis*, it’s all new. Other times the words are familiar like *vacuum* but when a scientist uses that term, it doesn’t usually refer to a cleaner.
7. **Mental Lapses** — Sometimes students just don’t get it in a lecture. They may if you say it once more or say it a little louder, but usually not. They need to hear you say it in a totally different way. They need examples, maybe a metaphor. Or, they may need you to take a short break so that they can discuss, explore, and explain it to the person sitting next to them.
8. **Note-Taking Skills** — Not all students have good ones. And to the extent they are worried about the difficulty of the content and their ability to understand, their motivation to write down exactly what the lecturer says increases. As the author points out, they are then so busy writing, they miss half of what is said. Spend a bit of time helping students learn what they need to write down. Sometimes an outline or guide distributed early in the course can help reinforce this lesson.
9. **Confronting Misconceptions** — Students can memorize right answers, regurgitate them on an exam, and leave the class with their original thinking still unchallenged. The author advises that lecturers be aware of the common misconceptions students bring to a course and tackle them head on. Don’t let students leave a course with their thinking undisturbed.
10. **Learning Modalities** — We live in a visual society and many students are visual learners. Lecturers need to reckon with these facts and make use of the wide array of visual supports now available — demonstrations, videos, computer animations, even the venerable overhead transparency which should not look like a page of text.

None of these ideas are new, but many of them are still absent from lectures delivered in lots of college classrooms. The author offers a nutshell summary: “Presenting an effective lecture is like writing a good drama — you must have a worthwhile story to tell and tell it in an interesting way.” (p. 454)

Reference: Conin Jones, L. L. (2002). Are lectures a thing of the past? *Journal of College Science Teaching*, 32 (7), 453-457.

Good Teaching in the Lab

“Laboratory instruction is a cornerstone of most science programs because it allows students to be actively involved in their learning.” (p.1197) So write two faculty authors in the department of chemistry at Purdue University. They also cite research documenting that teachers play a critical role in determining whether and how much students learn in labs. Despite this, there is very little research on what makes teaching effective in the laboratory and the ingredients of effective instruction generally (which are well documented) do not necessarily apply to this unique instructional setting.

To further advance our understanding of effective laboratory instruction, as well as to help with the development of more effective training and assessment strategies for TAs who provide the lion's share of laboratory instruction at large universities, these two researchers surveyed 800 students and 19 TAs involved in the first half of an introductory chemistry course for science and engineering majors at a large university in the Midwest.

The survey instrument collected demographic data, responses to 17 statements, which students rated on a 5-point Likert-type scale, and an open-ended question that asked respondents to describe the qualities that were important for an effective lab TA.

Of the 17 statements (drawn from a variety of sources) both student and TA respondents rated all of them at least somewhat important. Moreover, the TAs and students pretty much agreed as to which of these aspects of instruction were most important. Out of the top eight items, they agreed on these six: “is well prepared for lab,” “thoroughly understands the lab exercise,” “is able to help students understand what is going on in lab,” “explains and demonstrates necessary lab techniques,” “shows respect for students,” and “listens carefully and tries to understand students' problems.”

Students also had these two items in their top eight, “grades lab reports correct-

ly and fairly,” and “gives feedback on lab reports that is helpful.” Seventy-eight percent of the students listed the first of these items as very important compared with 50 percent of the TAs who rated it this same level of importance.

The list of all 17 items used in the survey is included in the article; and given that the vast majority of students rated them as a 4 or 5 (with 5 being very important), the list becomes a useful assessment instrument tailored for laboratory instruction in the sciences. If you are concerned about the validity of these items, you could use them as the researchers did — not as an evaluation of a particular instructor but as a description of effective lab instruction generally. If your students don't agree that they are all important, revise the list.

Researchers found that they could group students' responses to the open-ended request for qualities around three themes: 1) knowledge (as in knowledge of the experiment, knowledge of the chemistry behind the experiment, knowledge of students and how they learn, and knowledge about teaching); 2) communication skills (as in being able to communicate ideas well and explain things at an appropriate level); and 3) the affective domain (as in showing concern for students, being willing to help students, and being available and approachable).

The researchers write, “when the Likert data and free-response data are considered together, we note that students and TAs appear to rank knowledge-based qualities higher than affective domain qualities.” (p. 1203) However, they hasten to point out that this does not mean these students considered affective domain items unimportant. “More than half of the students who responded to the questionnaire mentioned both knowledge and affective domain qualities in their descriptions of an effective lab TA.” (p. 1203)

Lab courses offer students important learning experiences — ones often not found elsewhere in the curriculum. Given that potential, the instruction provided

there should be effective. This descriptive research increases our understanding of what that involves.

Reference: Herrington, D. G. and Nakhleh, M. B. (2003). What defines effective chemistry laboratory instruction? Teaching assistant and student perspectives. *Journal of Chemical Education*, 80 (10), 1197-1205. ♥

WORKING IN GROUPS

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revisions. A student in that group had one of the best individual letters in the class. He wrote in his reaction paper, “I felt in my gut that my letter was a lot better than the one the group selected. The group agreed on that letter with almost no discussion. I knew I should say something. The group was making a wrong decision right before my eyes, and I sat there and watched. Why didn't I do anything?”

That's a question he'll have to answer for himself. But when I read his reaction what came to mind were all times I have contributed less than I should have ... especially in faculty committees. I knew very well what the group needed, but I was tired, among my colleagues are turkeys and committee work so rarely makes a difference anyway. My students are often prevented by fears of what their peers will think. That is less of a problem for faculty; with us it's more about losing faith in the process. But in both cases the end result is the same: Time spent in groups that does not result in better products.

Ed.'s nte: Thanks to Tena for letting me combine her good idea with this exploration of knowledge application. For more details on her activity, be welcome to e-mail her. ♥

Using Oral Examinations in a Statistics Class

By Raymond J. O'Connor
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Written examinations in my four-credit sophomore statistics course had been disastrous for some time. Students routinely failed to allocate their time to answer all questions and were consistently upset that leaving one-fifth unanswered constrained their maximum score to 80 percent.

The worst aspect, however, was the task of grading their often mangled text. I used to agonize over whether wrong answers were a case of unclear writing or a lack of topic knowledge. I was also troubled because individual exam scores were often lower than my subjective perception of that student's ability.

The solution turned out to be the introduction of oral examinations. My course teaches students how to analyze ecological data of the types they will meet in their careers. The lectures provide the conceptual theory, emphasize the assumptions behind each statistical test, and teach students to choose those tests appropriate to the ecological question being addressed. In the laboratory and then independently in homework assignments, they work through examples of particular statistical tests, calculating and interpreting their results.

Each oral examination (three in all) involves a 12-minute session with each student. The core rules for student and examiner are: 1) questions will range over the entire course material covered to date; 2) whether the student answers correctly or not, there will be no follow-ups on any question (except to clarify ambiguity of response); 3) students are free (and encouraged) to "pass" on topics about which they are ignorant (this saves time); and 4) the grade is determined not by percentage of questions correct but by the extent and level of their subject mastery.

There are no set questions and the difficulty of the questions asked of each stu-

dent is raised or lowered as the oral exam progresses: questions to "A" and "C" students quickly come to focus on advanced or basic knowledge respectively, and a run of satisfactory "C" answers in the latter will result in some harder questions exploring whether a "C+" or a "B-" is justified; and so on.

I conduct the examination with the aid of a teaching assistant who fills several roles. First, the TA grades the student independently, reducing the potential for subjectivity (though we usually prove in close agreement). Second, the TA keeps notes on the topics answered well or poorly or passed on by the student, providing an examination record. (If a TA were not available, I would tape the examination to provide a record of the process.)

On completion of the oral exam, the student leaves, and the TA and I agree a grade. We later briefly compare all grades to ensure that standards did not drift over the course of the process; for this, the TA's notes provide an objective record. I've also discovered that the TA's notes reveal class-wide weaknesses, identifying where further instruction is needed.

How well does the system work? In the first year, when asked before receiving their grade, most students correctly self-assessed their own performance in the oral. Second, when orals were first introduced (mid-year), the average gain in grade over previous written examination grades was a letter and a sign (e.g., from a C to a B+). Third, because the oral coverage is always wide-ranging, student preparation is more extensive than it was previously.

Each year some or all of the students have organized themselves into amazingly effective study teams. Most telling, although the course continues to rate as extremely demanding (4.5 on a 5-point scale), multiple measures of student satisfaction and of student knowledge have risen. The oral examinations have consistently been rated by students as very fair

and very effective.

What are the difficulties? Colleagues usually ask first about the time commitment. But a written examination needs 10-15 minutes per student to grade anyway (plus time to construct and administer it), and is a problematical process for reasons discussed in the opening. So the cost is really only any inconvenience in scheduling each student's oral within working hours. Even then, a class of 40 students can be examined in only 10 hours of work time.

Second, occasionally a student freezes up or may even be reduced to tears. The policy that covers this contingency is announced beforehand: We stop the examination right there and re-schedule a repeat for a later time. After all, with no examination paper to keep secure and with its comprehensive scope, the new oral is uncontaminated by the faulty one. Also I can work to ease nervous students into the process by feeding them a few easy questions initially.

Third, and perhaps the hardest task, is maintaining the right level and flow of questions: One wants a B- student neither to be intimidated by lots of A-level questions nor to be denied the opportunity to shine by being offered too many unduly basic questions. I also work not to break the flow of questions by being drawn into exploring the boundaries of any single hole in a student's knowledge.

With these caveats, the use of oral examinations has proved to be a highly effective innovation in assessing statistical knowledge.

(Note: The author extends thanks to colleague Dr. Judith Rhymer for reviewing a draft of this manuscript.) ♥

A Large Learning Journal Assignment: Mechanics and Outcomes

Fifty percent of the grade and up to 10,000 words — that's the journal assignment Chris Park (reference below) gave 88 students in his Approaches to Environmental Management course. The weekly journal entries included response to the lectures, commentary and critique of two articles assigned for each week, and reflections on how understanding of the subject matter changed across the course. Students were encouraged to revisit but not revise earlier entries to accomplish this last objective. This learning journal was not meant "to be a seamless and perfectly structured piece of writing, rather it [was] meant to capture thoughts, feelings and impressions as they emerge[d]." (p.191)

Decisions about style and format were left up to the students and no template for structuring the journals was suggested. As a result students wrote and organized their journals in a variety of ways. They also tackled, responded to, and used course content in their journals quite differently as well. More details about the assignment appear in the article and full details can be found at this web address: www.lancs.ac.uk/staff/gyacp/374/default.htm.

"The learning journal is much more than just a log of what was being covered in the course, because producing it is a learning experience in itself." (p. 190) Most students found the task of keeping this 10-week journal a daunting one but for most it did become a learning experience in its own right. What follows are some highlights that students regularly reported as positive outcomes of the experience:

- **Ownership** — This journal assignment required students to take responsibility for their own learning. It forced them to respond, question, explain, connect, and integrate. They regularly recognized that this was happening.
- **Awareness of learning** — Being responsible for learning makes students

much more aware not only of what they learn but also of how they learn it. Sometimes the insights were mundane but insights nonetheless. "Either I was asleep in Monday's lecture, or I really made a mess of taking notes."

- **Self-confidence** — A substantive journal assignment like this builds confidence. Students see their capabilities in new lights. They realize that they can figure things out for themselves and that they can make decisions about what they need to learn, as well as what they might want to learn.
- **Regular reading** — Having to write a weekly entry and having to respond to assigned reading in it kept students up with the reading more regularly than usual. Some students reported this as a disadvantage of the assignment, but others discovered how the reading and lecture material related, combining to provide a much deeper understanding.
- **Focus on the whole course** — Having to track the development of their understanding gave students a whole course view. It encouraged them to "pull threads together and construct their own synthesis of the course material." (p. 193)
- **Reflectivity** — Students reported being more reflective in two senses. They found themselves being much more critical of the work those they were assigned to read or heard about in class, and they were more analytical regarding their understanding and how it was evolving. Some wrote about no longer taking things at face value but digging deeper to examine motivations and meanings.

As might be expected not all student response was positive. Already noted is the fact that many found the task very difficult

and challenging, and many felt constrained by the uncertainty of not knowing if they were really doing what the assignment required. They worried about assessment criteria and how they could be applied objectively. "Writing a journal was a new experience for all students in the course." (p. 195)

Park reports that he gained "invaluable" feedback from the journals as to how students "coped with different parts of the course." (p. 196) Through journals like these, an instructor can see how students study and how their response to the material changes. Obviously, the biggest downside for the instructor is the time commitment involved in grading these large papers. Park estimates it took between four and five times longer than it would have to grade a set of written exams. That the task was undertaken with 88 students bespeaks an uncommon commitment. But for faculty who teach smaller courses, seminars, and capstones for majors, a learning log assignment like this offers a promising device for integrating knowledge and transiting students to a place where they can assume responsibility for their own learning.

Reference: Park, C. (2003). Engaging students in the learning process: The learning journal. *Journal of Geography in Higher Education*, 27 (2), 183-199.

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