Guided Reading and Seminar Classes

Henry M. Walker

Department of Mathematics and Computer Science
Grinnell College, Grinnell, Iowa 50112 USA
walker@math.grin.edu

Over the years, students frequently have asked me to work with them on guided-reading or independent-study topics. While I greatly enjoy working with students and want to be accommodating, I must be realistic about what activities I can do. As at many (most? all?) schools, student demands and interests are extensive, but faculty time is not. Thus, in such circumstances, I often require students to take initiatives beyond what I require in regular courses.

This column reviews some general mechanisms to encourage students to actively engage a subject. In some cases, I have tried the approaches personally; other ideas have evolved from thoughts heard elsewhere. Most scenarios require the instructor to provide structure, insight, coaching, feedback, and management. Students have varying responsibilities.

Student Lectures

My most successful group-guided-reading course occurred some years ago, when seven students wanted to study a common topic. All were intelligent and motivated; what they needed was guidance and structure. Thus, in consultation with the group and before the semester, I selected two standard texts and developed a detailed, day-by-day schedule for a course that would meet three days a week. The first day, I provided a crash course on mechanics, organizing lectures, public speaking, handout preparation, and other related topics. Each subsequent day, lecturing rotated around the group on approximately a two-week cycle. Each speaker was responsible for synthesizing and presenting the designated material for the full class period. While students could consult me for assistance, they understood they largely were on their own to make up any deficiencies in one day's presentation. As you might expect, this added considerable incentive for presenters to be well prepared.

Overall, the course was remarkably successful. Early on, students learned the need for extensive preparation few were satisfied with their first lectures, but each improved quickly. Also, as the semester progressed, a friendly competition developed among the students, as they strove to outshine previous speakers. By the semester's end, lectures were consistently highly polished. Extensive, well-organized handouts became common; student presenters even came to class in business suits for an added sense of professionalism!

And, grading was particularly easy. With material building though the semester, everyone in the classroom knew immediately when a presenter was unclear about any topic. By the semester's end, each participant (including two sophomores) had presented material typically covered in graduate-level courses; impressive mastery was the norm.

Some Variations on Student Lectures

In the course just described, the group was small enough to allow informal feedback. In other contexts, students might be asked to complete evaluation forms for each student presentation. As these can be quite harsh at times, the instructor may prefer to collect these forms and then summarize the comments for the speaker using a consistently constructive tone.

As another variation, each presenter may assign 1 to 3 problems as part of the normal class assignment. Note, however, such student assignments often are very hard, and instructor monitoring may be needed.

Another variation requires each student to bring a one-page summary of the reading to class. The designated presenter then adds depth and perspective. (One instructor I know actually banishes from the classroom students lacking the summary. While this may seem harsh, this instructor reports that students are never unprepared a second time.)

As a variation for a guided-reading course with one student, the student and I developed an initial schedule of readings and exercises. Through the semester, the student then began our weekly meetings with a 30-minute presentation of the main points, ideas, and experiences of the past week. My role was to listen, raise questions, point out alternatives, and answer questions.

The Moore Method

R. L. Moore developed another variation on this theme for mathematics courses, emphasizing the use of discovery and inquiry-based methods. In this approach, now commonly called the Moore Method, the instructor provides handouts with definitions of terms and statements of results, but virtually no proofs. Thus, handouts provide a reasonable road map to the subject, with results broken down into challenging, but manageable, parts.

Class periods challenge students to explore the subject and develop their own proofs. During class, students present proofs they have developed; the instructor does not fill in the gaps.

Reading

If no student figures out the next required proof, the class may brainstorm possible approaches and revisit the problem in the next class. During the semester, each student must present a specified minimum number of results, and more participation is encouraged. Since the results typically vary in difficulty, this approach provides opportunities for students of varying abilities. In mathematics, this approach has a strong reputation as providing excellent preparation for later independent study and research. Additional information is available from <http://www.discovery.utexas.edu/dlp/dlp.html>.

Student-Based Discussion
Several approaches to active student participation begin with students preparing questions on assigned readings, highlighting topics to be addressed during the coming class. Variations on this approach involve the

distribution and use of these questions. The instructor may collect the questions as an aid for lecture preparation or may distribute a question summary; or questions may be circulated to the full class either with or without attribution. In my experience, students initially need help in framing questions and identifying issues for discussion. When these questions go only to the instructor, students may feel less risk in posing interesting questions. The instructor then may use selected questions anonymously to begin discussion. As the semester progresses, students generally write better questions, which then may be distributed to the class, first anonymously and then with attribution.

Naturally, instructors need not lead all class sessions. Students may lead discussions perhaps based on their own questions or prepared opening statements. While leadership responsibilities commonly rotate

following a fixed pattern, this may encourage students to prepare only the parts they will lead. Alternatively, the leader may be selected randomly. Thus, one colleague of mine puts student names on a wheel, which is spun to begin discussions. Another literally draws names from a hat. Alternatively, one can run a program to randomly select a name, displaying the output on classroom monitors. While any random draw is arbitrary, students respond well to a perceived sense of fairness.

Other Ideas
Of course, this column only begins a discussion of ways to encourage students to actively engage course material and to make them responsible for classroom activities. Thus, *I especially welcome readers' ideas and comments on this or other Classroom Issues.* Send your thoughts to <walker@cs.grinnell.edu>.

Experiences: Ideas for Enriching the Curriculum

Student Mentors

Judith L. Gersting
Department of Computer Science
University of Hawaii at Hilo
Hilo, Hawaii 96720 USA
gersting@hawaii.edu

Frank H. Young
Department of Computer Science
Rose-Hulman Institute of Technology
Terre Haute, Indiana 47803 USA
young@cs.rose-hulman.edu

Most faculty members would agree that academic advising is a task that goes beyond merely signing the students' course registration forms or even helping them plan a course schedule. What we may miss is that advising need not be solely a faculty (or staff) responsibility, but can be shared by other students. Indeed, students bring a unique perspective to advising; they can tell fellow students things that don't occur to faculty or staff, and they can do it in a "tell-it-like-it-is" manner.

One school assigns each volunteer upperclass computer science major as

a mentor to four or five freshman majors. A brief written description of expectations for both mentors and advisees is helpful, but the general operation is this: About halfway through the CS-1 course, a class period is set aside for the mentors to come to class and meet their assigned advisees. This occurs far enough along in the semester for the freshman to have some sense of how difficult their chosen major may be, but early enough to help them climb out of trouble if necessary. This meeting also occurs prior to advance registration for the following semester.

Introductions consist of the mentors giving their names, where they come from, what year they are, and when they expect to graduate. Then each mentor sits with his or her group and talks. Interesting tidbits of conversation have been overheard:
- How much time are you spending in the lab on these assignments? That's not enough, you need to be prepared to spend much more than that.
- Yes, in the next course you really need to know all this stuff.
- No, he's not such a hard grader, but you do have to get stuff in on time.