ABSTRACT

At large universities, optional seminars that dovetail with large-enrollment courses can provide meaningful small-class experiences for students who want them. I teach an optional, one-credit, limited enrollment course, offered in conjunction with the large-enrollment course, Geology of the National Parks. This seminar, being discussion-oriented, differs greatly in design and philosophy from required lab meetings. It allows in-depth discussion of course material and related topics, as well as instruction in writing and research. Perhaps most importantly, it allows meaningful interaction between student and professor.

Keywords: Education—undergraduate, Geoscience—teaching and curriculum.

INTRODUCTION

First and second year students at large universities typically have few opportunities to take small classes (e.g., Erickson and Strommer, 1991). This situation applies to geology, where introductory classes may have enrollments in excess of 200 students. Consequently, most students experience little one-on-one contact with their professor and receive only minor feedback on their academic performance. Additionally, because of the large lecture format, learning typically occurs passively, without fully engaging the students. As a result, many students who might ordinarily become excited by geology become bored and drift into other fields. Even worse, some of them fall through the cracks in the university system or transfer to smaller schools with smaller class sizes.

By offering a limited enrollment (12 student maximum), one credit, optional seminar attached to the large-enrollment course, Geology of the National Parks (90-100 students), I am reaching some of the motivated students who desire a small-class experience. The seminar accomplishes several things that the lecture course cannot: it gives students more contact with their professor and receive only minor feedback on their academic performance. Additionally, because of the large lecture format, learning typically occurs passively, without fully engaging the students. As a result, many students who might ordinarily become excited by geology become bored and drift into other fields. Even worse, some of them fall through the cracks in the university system or transfer to smaller schools with smaller class sizes.

DIFFERENCES WITH OTHER SEMINARS, LABS, OR DISCUSSION SECTIONS

The seminar described here differs from other methods of bringing small classroom experiences to students at large universities, including freshman seminars, labs, and discussion sections. It differs from freshman seminars in that it is available to all students, as opposed to only freshmen. It is academically linked to a specific, large-enrollment (>50 students) course that provides a contextual backdrop for learning. Furthermore, enrollment in the seminar is smaller than most freshman-only courses which tend to have about 25 students.

Lab and discussion sections do serve similar purposes as the seminar in that they generally provide hands-on experience with the course material. However, a major goal of the seminar is to provide interaction between students and the professor—most lower division labs at large universities are taught by graduate students. The seminar also emphasizes discussion of readings and writing assignments that aim to connect the main course material to other fields. Finally, the optional nature of the seminar means that it contains a relatively high percentage of students who are genuinely interested in the material. By contrast, labs and discussion sections are typically required components of larger courses.

THE MAIN LECTURE COURSE: GEOLOGY OF THE NATIONAL PARKS

At the University of Oregon, Geology of the National Parks is a 4 credit course that is taught during fall quarter. It typically carries an enrollment of 90 to 100 students. Each week, students attend three 50 minute lectures and one 50 minute discussion section. The discussion sections are essentially shortened lab periods in that they provide hands-on, group learning activities. A more complete description of the course’s curriculum is described by Miller (2001).

THE SEMINAR: TOPICS IN NATIONAL PARK GEOLOGY

I announce the existence of the seminar to students during the first lecture of the term, and show them the course curriculum and intent (Table 1). I explain that the seminar 1) has a maximum enrollment of twelve students, 2) is graded on a pass/no pass basis, and 3) is open to anyone in the course on a first-come first-serve basis. The first-come first-serve basis is necessary to make the course equally available to students of all levels.
Curriculum and Requirements - The seminar generally meets once each week for 50 minutes. We start most meetings with a brief rundown of difficult topics from the previous discussion section or lecture, and then proceed to the day’s topic. These topics, listed in Table 1, range from outside readings to rock identification to a slide show and discussion of Arches and Canyonlands national parks in Utah.

The goals for the seminar are straightforward: to provide a small class setting; to discuss specific aspects of National Parks that are peripheral to the course; to add emphasis on writing, including instruction on library research; to review some important topics from the discussion (lab) meetings. Except for writing, these goals are attainable during our meetings, so outside course requirements are not very demanding. The required essay on the seminar readings (Table 1) provides a springboard to discuss writing techniques, while the outline for the final essay assignment in the main course forces students to compile references and organize their thoughts well in advance of the due date.

Results and Evaluations - Based on student evaluations, and a comparison of course grades between seminar student and non-seminar students from fall quarter, 2000, the seminar is highly successful. Figure 1 shows student responses to six questions I posed at the end of the quarter. In the year 2000, eleven of the twelve students took the evaluation; they rated each question from 1-10. As the lowest score was a 4, none of the histograms go below 4.

These histograms demonstrate a high degree of course satisfaction on the part of the students. Most importantly, the students liked the small class environment, found the discussions worthwhile, and indicated they would be more inclined to take a course if it offered a similarly structured seminar.

Equally telling are the student grades. Those students in the Fall, 2000 seminar received a mean grade point of 3.6 whereas the entire group (including those in the seminar) received only a 2.8. This difference indicates either 1) the seminar greatly improved students’ performance in the main course, 2) the group was self-selected in that stronger and more motivated students signed up for the course, or 3) a combination of improvement and self-selection. In either case, the grade difference, when combined with the high degree of student satisfaction with the seminar indicates success: ei-
ther students learned more, or some of the stronger students found a more meaningful experience.

APPLICABILITY TO OTHER COURSES

Besides review of selected course material, the described seminar emphasizes the following activities:

- Readings assignments that relate course material to students’ experiences
- Discussion
- Writing assignments with feedback
- Library research

These activities stand out as being distinctly small-class related and not unique to the main course’s subject: Geology of National Parks. The main course only provides the background and theme for the seminar. Therefore, the seminar can be easily modified to complement virtually any large lecture course. The possibilities for seminar reading and/or discussion topics are nearly endless because, almost by definition, introductory courses can only introduce, rather than thoroughly explore, course material. Beginning with lecture material as background, a professor can use the seminar time to make connections between course topics, discuss their relevance, or simply understand them better.

The actual size of the seminar can/should also be modified to suit the instructor’s preferences and size of the main course. A maximum enrollment of twelve seems about right for me and my course of 90 to 100 students. However, seminars for much larger lecture courses could be expanded to accommodate the larger pool of interested students. Here, the first-come first-serve enrollment is especially important because it ensures that all students who attend the first class meeting have an equal chance of taking the seminar.

DISCUSSION

To help combat the passive learning that so characterizes large lecture classes, many instructors employ group learning methods during class time (e.g., Cooper and Robinson, 2000a, 2000b; Macdonald and Korinek, 1995; Tewksbury, 1995). These methods work because they help break up the monotony of the lecture while requiring students to participate actively in the class. Still, the class meeting takes place in a large lecture room with perhaps 100 or more other students. Consequently, students make little direct contact with the professor, and, unless group work is a major emphasis of the meeting, students seldom discuss course material to any depth.

Contact with professors and class discussions appear to be important factors in retention of students at large universities. Generally speaking, the degree of social and academic integration into the campus community plays a key role in the success or failure of an individual student (Astin, 1993; Tinto, 1997); integration on an academic level becomes increasingly important as the student progresses beyond his/her first year (Frost, 1993). Contact with professors facilitates this integration because, among other things, it allows professors to encourage and motivate the students (Cokley, 2000) and demonstrate that they care about the course material and student learning (e.g. Wulff et al., 1987; Erickson and Strommer, 1991). Meaningful class discussion also facilitates integration (Braxton et al., 2000), probably because it connects students intellectually and stimulates academic interest beyond the classroom.

Clearly, small class sizes allow greater student-professor interaction and more use of discussion than large class sizes, both attractions of the seminar described here. However, not all students want small classes. In a study at the University of Washington, for example, 41% of 327 surveyed students preferred class sizes that exceeded 100 students. As positive aspects of large classes, they cited the large numbers of peers, the low pressure atmosphere, the sense of personal independence, and the ‘variety of attendance options’, which included skipping class (Wulff et al., 1987). Moreover, abundant research finds that there is little difference in levels of overall student satisfaction between large and small courses, if the courses are taught well (e.g. Marsh et al., 1979; Williams et al., 1985; Wulff et al., 1987; Lesser and Ferrand, 2000).
The seminar described here takes advantage of both small and large class sizes. Because it is optional, it targets those who want small class experiences. The small size permits the seminar to emphasize class discussion, writing, and feedback from the professor features not readily available in large classes. However, the seminar also gains advantages of large classes because the students are all enrolled in the associated lecture. Moreover, the lecture provides a contextual backdrop for students to frame their discussions, form friendships, and create study groups.

CONCLUSIONS

By offering optional, one credit seminars in conjunction with their larger lecture courses, professors can bring small-class benefits to themselves and some of their students. These benefits include greater use of class discussion and increased interaction between students and the professor, both of which are probably important factors in student satisfaction and retention. Benefits also stem from the wide range of potential subject material. Among other things, seminar meetings can cover material from the main course in greater depth, explore connections between the main course and other subjects, or emphasize learning skills.

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REFERENCES


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