

## Small-Group Peer Teaching in an Introductory Biology Classroom

By Jack Tessier

***Having nonmajor general biology students teach each other in small groups helped improve student learning when compared to students in traditional lecture-based courses. This form of collaborative learning helped students with the lowest grades the most.***

All teachers want their students to learn, enjoy, and be engaged in their classes. A good way to create such results is to incorporate active learning approaches into classrooms. Many teachers, however, do not know how to start making these changes and can benefit from seeing examples from other classrooms. This paper describes one approach to active learning known as small-group peer teaching (SGPT), which has increased student learning and engagement in my large, nonmajor, introductory biology course.

This course was specifically designed for a class of 70–75 students aspiring to be elementary school teachers. The goal of this design was to help these preservice teachers learn more foundational biology knowledge (i.e., the basic concepts of biology; Fink 2003) than they would in a lecture-based course, becoming comfortable enough with biology to share it frequently with their future students.

The use of active learning has been encouraged for some time (King 1993; NSF 1996; NRC 1997) and has been widely used in high school set-

tings (e.g., Lazarowitz et al. 1996). College classrooms tend to be dominated by lecturing, but some examples exist where field trips, concept maps, writing assignments, case studies, and creative props have been used (Verderber 1993; Lunsford and Herzog 1997; Caccavo 2001; Tessier 2006). These strategies fall under the broad heading of collaborative learning (Dillenbourg 1999; Thousand, Villa, and Nevin 2002), where students work together in groups toward a common goal. Generally, such approaches improve student learning (Klionsky 1998; Lord 2001) and the sense of community in the classroom (Johnson and Johnson 1987, Summers, Beretvas, and Gorin 2005). Where such active approaches have been implemented, students are sometimes reluctant about the changes at first (Goodwin, Miller, and Cheetham 1991), but course modifications eventually lead to improvements in questioning and thinking skills (Udovic et al. 2002), students attitudes about the subject (O'Connell McManus, Dunn, and Denig 2003), learning skills (Goodwin, Miller, and Cheetham 1991), participation (McClanahan and McClanahan 2002), and content knowledge (Harmon, Katims, and

Whittington 2002; Powell and Wells 2002; Singer, Tal, and Wu 2003).

I have previously used peer teaching (Tessier 2004) where students presented course material to the whole class. Peer teaching in that initial format is a form of collaborative learning in which students work together to teach the whole class. While this approach improved student understanding of the specific material they taught, it did not help with their understanding of the material from the rest of the course (Tessier 2004). Students need to be directly engaged in more material to fully benefit from the peer-teaching experience. In an effort to increase the amount of material taught by each student and to make my course design match more directly the learning needs of my students (Spuches 2002), I modified the peer-teaching approach to make use of small groups. This new small-group peer teaching design is a form of collaborative learning that accommodates multiple learning styles.

The objectives of this study were to:

- ♦ increase the percentage of course material taught by individual students,
- ♦ decrease the audience size for the peer teacher,
- ♦ document the effectiveness of this teaching strategy in increasing students' content knowledge of biology, and
- ♦ assess student impressions and feelings about SGPT.

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