

# **Interteaching: Ten Tips for Effective Implementation**

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Interteaching (Boyce & Hineline, 2002) is a new, multi-component method of classroom instruction that has its roots in B. F. Skinner's operant psychology, or as it is more commonly known today, behavior analysis. Behavior analysis views a person's behavior — which includes acting (overt behavior) and thinking or feeling (covert behavior) — as a function of three interacting variables: genetics, past experiences, and current environmental conditions (e.g., Hineline, 1980). Because a person's genetics and past experiences cannot be manipulated, modifying behavior becomes largely a matter of manipulating current environmental conditions (Cooper, Heron, & Heward, 2006). When changes in behavior occur as a function of these manipulations, we say that learning has occurred. In accord with this view, interteaching attempts to improve student learning by rearranging the classroom environment, and by modifying many of the environmental variables (those that are manipulable) that impact the way students act, think, and feel.

## **Interteaching: A Brief Review**

A typical interteaching session may proceed as follows (Boyce & Hineline, 2002, and Saville, Lambert & Robertson, 2011): First, the instructor creates a preparation (prep) guide, which guides students through a reading assignment before class. The prep guides typically cover five to 20 pages of material (depending on the difficulty of the material, number of weekly meetings, and so on), and include eight to 15 items that require students to define and apply course concepts and engage in higher-order thinking. The instructor makes the prep guide available several days in advance (often via a course web site), and students complete the prep-guide items before they come to class. Once in class, students hear a brief clarifying lecture that lasts about one third of the class period, and covers material from the previous class that students had a hard time understanding. After the lecture, students get into pairs (usually with a different partner each day), and spend the remaining class time discussing the prep-guide items that they prepared for that day. During the discussions, the instructor (and sometimes a teaching assistant, if necessary and available) moves around the room, answering questions and guiding students' discussions. Once students have finished their discussions, they complete a record sheet on which they list, among other things, any prep-guide items they would like the instructor to discuss at the start of the next class period. The instructor then uses the information on the record sheets to construct a clarifying lecture that begins the next class period, targets items from the prep guide that students found confusing, and precedes discussion of the next prep guide that students prepared for that day.

In addition to the general structure outlined above, there are other components to interteaching. For each discussion they complete, students earn a small number of participation points that, across the semester, total approximately 10% of their course grade. Boyce and Hineline (2002) also suggested that instructors should give at least five "probes," or exams, during the semester, and consider dropping the lowest score. Importantly, the exam material should be closely tied to the prep-guide items, which lets students know that discussing the prep guides thoroughly will serve as practice for the subsequent exams. Finally, Boyce and Hineline (2002) introduced quality points as a way to improve the quality of students'

discussions. In essence, quality points refers to a cooperative contingency in which part of each student's course grade is dependent on how his or her discussion partners performed on certain exam questions (although see Saville & Zinn, 2009, for a study in which quality points did not significantly affect exam performance). Boyce and Hineline suggest that quality points should account for 10% of each student's final course grade.

Since Boyce and Hineline's (2002) introduction of interteaching a decade ago, researchers have begun to examine its efficacy relative to more traditional teaching methods. In an early, lab-based study, Saville, Zinn, and Elliott (2005) compared interteaching to lecture and reading, and found that interteaching produced significantly higher performance on a quiz given one week later. In a subsequent classroom-based study, Saville, Zinn, Neef, Van Norman, and Ferreri (2006, Study 2) compared interteaching to lecture in two sections of an undergraduate research methods course, and observed that interteaching increased exam scores on average by about ten percentage points. More recently, Saville, Pope, Truelove, and Williams (in press) found that interteaching had its biggest impact on the exam scores of students with low and moderate GPAs. A growing number of studies have found that interteaching produces superior student-learning outcomes when compared to lecture (Arntzen & Hoium, 2010; Saville, Zinn, Lawrence, Barron, & Andre, 2008; Scoboria & Pascual-Leone, 2009), and that many students prefer interteaching to lectures (Goto & Schneider, 2009; Saville et al., 2006; Scoboria & Pascual-Leone, 2009).

Although interteaching seems to be an effective pedagogical tool, introducing a new teaching method is often complicated by factors that are unique to specific teaching settings (Chew et al., 2009; Daniel & Poole, 2009), and the same goes for interteaching. Over the past eight or so years, there have been several factors that have forced me to reconsider how I implement interteaching in my courses. Below are ten teaching tips that may help smooth the transition for instructors who are interested in adopting interteaching in their classrooms.

### **Don't Stray Too Far from the Original Method**

Behavioral teaching methods, including interteaching, are structured the way they are for a very specific reason — to capitalize on well-known principles of learning (e.g., stimulus control, reinforcement). Thus, deviating too far from the original method is likely to minimize interteaching's impact on student learning. For example, some interteaching users report that they only lecture *before* the pair discussions rather than after. Their rationale has been that lecturing beforehand provides students with information that minimizes confusion, and enhances the discussions. Thus, because clarifying before leads to quality discussions, there is no need to lecture afterwards. However, as Boyce and Hineline (2002) noted, the clarifying lectures in interteaching come afterwards for a very specific reason: Lectures that contain student-requested material are more likely to function as positive consequences that maintain student interest. In accord with this idea, my colleague, Tracy Zinn, has collected data showing that moving the lectures before the discussions results in significantly worse exam performance. Although a very brief lecture over a particularly hard topic might be reasonable if you want to "set the stage" for a good discussion, you should refrain from lecturing too much beforehand (if at all) and instead save the bulk of your clarification for after the discussions.

I have also heard that some interteaching users remove the lectures altogether. Removing the lectures, they claim, causes students to ask more questions during the discussions, which results in better

learning. This line of thinking, however, has not been borne out by research, but rather, the opposite has been shown. Saville, Cox, O'Brien, and Vanderveldt (2011) found that students who received clarifying lectures earned better course grades than students who did not receive lectures. In short, any dramatic deviations from the general format described above are likely to result in a weakening of contingencies that have a positive effect on learning.

### **Explain Why You Are Using Interteaching**

By the time students reach college, most are intimately familiar with lecture-based classes. Thus, when students encounter new teaching methods, there is sometimes resistance, especially from those who have learned how to “jump through the hoops,” to get good grades. They ask questions such as, “Why are you making me do all of these prep guides when I already get good grades?” When these questions arise, it's important to remember that, although *you* may understand the rationale underlying interteaching, your students probably do not. Thus, at the start of the semester, and frequently throughout, you should tell students why you are using interteaching, citing such reasons as, to improve learning and to improve teamwork, and you may even want to show them a little data (I always show them the results from Saville et al., 2005, 2006). Ultimately, taking time to explain why you use interteaching will get students on board faster, and may even increase student-teacher rapport, a variable with numerous positive benefits (Buskist & Saville, 2004).

### **Consider Time Constraints**

When implementing interteaching, you need to consider time constraints. As with any new teaching method, course preparation takes time. Specifically, constructing good prep-guide items, the kinds that make students dig into the readings and really think about the material, can be time consuming. Thus, I would not recommend implementing interteaching on short notice. Instead, you might want to implement it during a semester when you have adequate time to prepare (e.g., preparing over the summer for a fall course). Another option would be to “phase in” interteaching over the course of a few semesters by introducing it for one or two units of information each time you teach a particular course. Although interteaching ultimately reduces course preparation, its front-end requirements are important to consider.

### **Give It Time**

As you begin interteaching, keep in mind that it may take a while for it to “flow smoothly” in your courses. For example, identifying which prep-guide items optimize student discussion, or determining how many pages to cover on particular prep, may take some time. Similarly, identifying how many questions to review during the lectures (see below) may take some time. If things aren't perfect the first time around, you shouldn't abandon interteaching. Just like when you started lecturing, things got better, and the same will likely be true when you introduce interteaching into your courses.

### **Write Good Prep-Guide Items**

Because you, like all teachers, are strapped for time, you may be tempted to “steal” questions from instructors' manuals, or to take questions from textbook chapters to include on your prep guides. Although this certainly speeds up prep-guide construction, these questions sometimes do not produce the

types of “deep” thinking and discussing that improve learning. Thus, it is important that you take the time to write questions that require students to think, examine the material more than they might otherwise, and maybe even engage in a bit of civilized debate during the discussions. One way to accomplish this task, is to use Bloom’s taxonomy as a guide (Anderson & Krathwohl, 2001), writing questions that range from definition-type questions to higher-order questions that require students to create and critically analyze information. Although students may struggle with higher-order questions at first, particularly if they are used to learning and testing formats that require lower-level thinking, most get used to the structure and eventually end up enjoying the process.

### **Make Prep Guides a Reasonable Length**

Although students have approximately two thirds of each class period to complete their discussions, there are times when some students finish early. In my classes, as long as students have had productive discussions and feel comfortable with the material, I allow them to leave a few minutes early. Unfortunately, some students see the self-paced nature of the discussions as a way to get out of class early. To preclude this from occurring, some instructors might resort to making the prep guides longer. If the prep guides are too long, however, some students find interteaching to be aversive. There are at least two ways to accomplish the goal of increasing discussion length without adding questions to the prep guides. First, you could bring supplementary materials to class (Saville et al., 2011). If students finish early, they can answer additional questions, analyze journal articles, and so on. Second, and related to the previous recommendation, make sure your prep guides contain the types of questions that induce discussion. Namely, this means minimizing lower-level questions and including more high-level questions. Both of these strategies should lead to longer discussions, even though the prep guides include the same number of items.

### **Take Steps to Increase Prep-Guide Completion, If Necessary**

Because students spend a good chunk of time discussing the material with each other, it is important that they come to class prepared. Otherwise, the discussions turn into a “one-party affair” that leads some students to become frustrated. Although negative social consequences seem to minimize the number of students who come to class unprepared (Boyce & Hineline, 2002), there are still some who, on occasion, fail to do their work ahead of time. There are steps you can take, however, if you determine that prep-guide incompleteness is becoming a problem. First, having students work with different partners each class period (as noted above) seems to increase class preparation, largely because students don’t know how their partners will respond if they are unprepared. If this doesn’t work, you could require a completed prep guide as a “ticket of admission.” This could be as simple as standing at the door before class and randomly checking a few students’ prep guides. Those who are done can stay and earn their participation points, while those who are not finished either must leave, or you may allow them to stay but not receive points. A final strategy, one that my students came up with several semesters ago, entails randomly checking a small number (e.g., 10-20% of the class) of prep guides during the discussions every class. If students have completed most of the prep-guide items, they get their participation points for the day, and if they have not, they don’t. Ultimately, taking steps to increase prep-guide completion should have a positive effect on your students’ learning.

### **Connect Prep-Guide Items and Exam Questions**

Boyce and Hinline (2002) suggest that there should be a clear link between the prep-guide items and the questions that appear on exams. The exam questions need not be identical (although Boyce and Hinline suggest that the exams should contain at least one essay-type question that comes *directly* from the prep guides), but there should be a strong enough link that students are able to see the relation between the items they discuss in class and the questions they answer on the exams. For example, if some of your prep-guide items ask students to identify examples of positive reinforcement, a few exam items might ask them to identify other examples of positive reinforcement. As Boyce and Hinline note, if students have effective discussions, and if they have a clear idea of what to discuss in preparation for the exams, then most of their learning should occur in class; the exams are simply a way to probe whether students have learned the material correctly.

### **Tell Students What It Means to Have a “Quality” Discussion**

A central component of interteaching is the pair discussion that forms the basis for much of each class session. Unfortunately, however, some students are unaware of what it means to have a quality discussion. As a result, they often report on their record sheets that they had an “excellent” discussion when, in fact, they did not engage in the kinds of behavior that enhance learning. Therefore, you should spend some time discussing with students what it means to have a “quality” discussion. Students are sometimes surprised to find that quality discussions do not necessarily mean total agreement with their partners, or that quality discussions can still occur even if they don’t know the answer to a particular question. My colleague, Dan Holt, and his students have gone so far as to create a discussion rubric that identifies the specific behaviors that represent a “poor” discussion, an “excellent” discussion, and all points in between (see Figure 1 for a sample rubric). Regardless of how you decide to address this issue, be sure to spend some time letting your students know what quality discussions entail.

### **Don’t Lecture Over Too Many Prep-Guide Items**

During the lectures, you should cover only those items or topics that a majority of your students requested. In my experience, this usually means no more than three or four items (see Saville et al., 2011). Some instructors might be tempted to cover every item during the lectures, with the concern that their students will miss something important, but there are three reasons, I believe, why you should limit the number of items you cover. First, focusing on the most requested items results in the biggest bang for your buck: Rather than spending your time on items that only a few students requested, you can cover material that the greatest number had trouble understanding, which keeps the lecture interesting. If there are items that only a few students requested, you can tell them that you’d be happy to answer their questions via email, during office hours, or after class. Second, if students know you’re only going to be covering a limited number of items, they’re more likely to discuss the items in depth and ask questions in class. Finally, the more you lecture, the less time there is for students to actively learn the material. In essence, the more items you cover, the more your classroom reverts to the lecture-based format with which you began, taking away time from discussion and interteaching.

### **Conclusion**

So there you have it — 10 tips for effectively implementing interteaching into your courses. If space allowed, I could probably add a few more items to the list, but nevertheless, these 10 tips should get you started. Of course, I must provide a caveat that, to date, the literature on interteaching, although growing,

is still relatively small (for a review, see Saville et al., 2011). Thus, many of my tips have yet to be tested in a controlled, systematic way. This is both good and bad. The bad is that some of my tips may prove ineffective at increasing student learning and enjoyment, but the good is that each of these tips provides a fruitful avenue for potentially meaningful research on interteaching, specifically, and on teaching and learning in general. Hopefully, researchers engaged in the scholarship of teaching and learning will examine these tips and help find ways to improve the efficacy of interteaching, and the factors that increase student enjoyment of this seemingly useful teaching method.