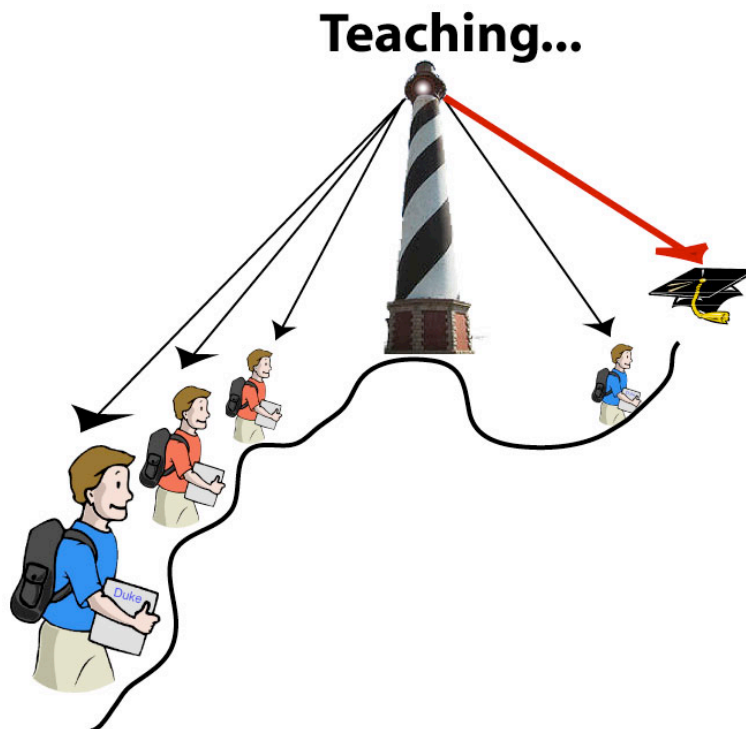


Teaching as a developmental process

My interests concern the development of cognitive abilities in humans and the interaction between experience and brain growth. Coming from this background, I also approach learning as a developmental process. Every step has to be built on a foundation, on a previous step that enables the students to make the transition to the next stage of knowledge. Development does not always proceed in incremental steps and straight forward - development can involve periods of decline and a loss of previous abilities. Such events are sometimes needed for further growth and gain. Similarly, teaching students shouldn't be seen as a straight line and a linear increase of knowledge from the first day of class to the last day of class. At some point during term, students will feel overwhelmed and confused but this feeling is natural and will disappear once related topics start to connect and a bigger, overarching picture emerges. As an instructor, it is my role to steer students through this developmental process of learning. I need to provide them with a guiding light to stay on track while at the same time leave them room and freedom to explore on their own. In some sense, a lighthouse provides a good metaphor for my role as teacher. A lighthouse provides guidance and direction but the ships still have to choose to follow the lighthouse themselves. Psychological research has shown that learning-by-doing often provides benefits over plain observational learning. Therefore, as I teach I need to provide instructions and guidance while at the same time encourage students to find the way on their own. In teaching, this directly translates into providing access to resources for students while allowing students to explore and expand these resources by themselves. Maybe one of the hardest tasks for a teacher is to prevent students from going too far off the track and to keep a whole classroom of students progressing in the same direction.



Courses and expectations

The developmental framework I have pointed out above also extends into the content of the classes that I teach. In my classes I try to highlight the developmental progression of an idea or method. Where does an idea come from and why did it evolve to what we have now? In the past I have been teaching discussion sections for PSY91 Biological Basis of Behavior and in the spring term I will teach a graduate student workshop on Training and Teaching. These two classes have very different student populations and aims. Since the graduate level class is still under preparation I will focus on my undergraduate class in the following.

Biological Basis of Behavior (see syllabus) is an undergraduate level course that introduces the main ideas of Biological Psychology to students. The goal of Biological Psychology is to explain how human behavior is generated by our brain and nervous system. In particular, this class describes how our nervous system gives rise to our complex abilities such as reasoning, memory, language or perception in general. What happens if something goes wrong with our brain or nervous system and why do patients with certain disorders show the disabilities they have and what are potential treatments. A class with such a broad scope necessarily cannot cover a single topic in great depth. The main goal of this class is therefore to introduce students to the wide range of phenomena, theories, approaches and methods used in Biological Psychology and to highlight their differences and similarities. Students are expected to understand this material at various different levels. First, students need to show knowledge about the brain and its structures. Next, students need to be able to understand the interconnections of the brain and translate this knowledge into predictions about the effect of surgery or disease on human behavior. And finally, students need to be able to create new research ideas themselves and evaluate research ideas from other students. In summary, following completion of this class, students should be able to read and understand original research themselves and to critically evaluate the value of the research. To assess student's ability to produce and evaluate research, students will write a research paper and peer-review each other's papers (see assignment).

Encouraging student learning

To help my students reach the learning objectives described above I focus my sections on topics covered in class but encourage students to relate this topic to their own experiences. Students learn best when the material is repeated several times and when they are able to make personal connections. To achieve this goal, students are asked to read two or more original research articles and comment on them (see section requirements). From personal experience, I prefer to have students post a short comment to an online discussion board before class since this has proven to enhance in-class discussions. Most importantly, I give students the option to post their own reaction or to post a response to another student, thereby starting the discussion already before they come to class (picture of discussion board activity). During class sessions I first provide a short introduction to the general topic (sample slides) to provide a basis for discussion. Then I ask students specific questions about the readings to engage them and make sure that they have read the papers but also to identify points that need further clarification.

And finally, I moderate an open discussion with students where I provide only broad and general questions to spark or guide participation. In this process I also encourage students to reply to comments by other students. This kind of discussion allows students to bring in their own experiences and opinions and to relate the material to more concrete situations. Ideally, students would continue their discussions with each other after class.

Another way to enhance student learning is repetition and continuous testing. In my class I provide students with short quizzes every week that tests their knowledge of the past lectures. The purpose of these quizzes is not to test or evaluate students - in fact the quizzes are not being graded - but to repeat the material and to help students identify their own weaknesses. The correct solutions for each quiz are discussed right after the quiz is finished to provide immediate feedback for the students. Finally, I believe that students learn better when they feel some kind of responsibility for the class themselves. In my class, each student has been assigned to a group and together students have to present the readings and guide discussion at least once during the term. This approach is effective because, on the one hand students want to give a good presentation and each group invests time and effort into their work. And on the other hand, other students in the class engage more because they want to help their friends by providing a lively discussion. Switching seats once and seeing the class from the teacher's perspective is a valuable experience. Students can learn what a teacher sees as important aspects of the lecture and how to adjust their own participation in class.

Technology in the classroom

To achieve the specific teaching goals and practices I have outlined above I make use of both traditional and modern teaching methods and technologies. Lecture parts during my classes are presented using PowerPoint and a computer. My choice for a presentation software over an ordinary chalkboard lecture are threefold:

First, using a computer for my lectures allows me to make use of online resources during class. For example, I can give students a live demonstration how to access an online journal article and how to search for it. Or I can point students to online resources that relate to the current topic by quickly browsing to the website. While it would be possible to present such information static on a slide, it is much more engaging for students to have a live demonstration. Furthermore, such demonstrations make a lecture more interesting for students by changing the speed and content of the lecture.

Second, digital media such as movies and images can be easily added to computer presentation. In particular, short excerpts from popular movies can be used to illustrate a point or provide an example. Again, such a measure establishes a short break during the lecture that allows students to re-focus attention. Using excerpts from popular media also allows students to relate a topic more to their own experiences and opinions. For example, during a lecture on language I have used a short passage from the movie "Lost in translation" to highlight the differences between languages and the importance of effective communication.

And last but not least, modern presentation software allows me to present static content in a dynamic, multi-sensory way. Research on learning styles has

shown that different students learn best if information is presented in their preferred modality. By presenting content in several modalities at the same time I enable students to get most out of the lecture. A related research finding is the so called "Intersensory Redundancy Hypothesis" that states that learning is enhanced if information is provided simultaneously in several modalities. Modern computer presentation software allows me to make use of these two principles.

Student discussion and participation is another vital part of my teaching. As indicated above, the use of online discussion boards has proven valuable for enhancing student participation and the quality of in-class discussion sections. Besides the obvious benefits of such technology on the class session, another benefit is the availability of its content to students throughout the year. For example, students can be asked to make an initial comment on a topic covered in class and later students can be asked to return to this comment and rethink it or comment on their original comment. Such an iterative process makes students aware of their progress and helps to engage them. I have mentioned above that I encourage students to take on responsibility for a course.

In the upcoming spring semester I will teach a graduate student course and for this course I plan to make use of another technology. For the class that I am about to teach the syllabus is still very open and we do not have to cover a certain topic during the term. Therefore, as a first assignment for class I will ask my students to design the syllabus for the class together. This will be done using a web-site that every student can edit and change: a so called wiki. This web-site will, over time, develop into the course syllabus. By doing this I can create a class that meets the needs of students and lies at the very heart of their interests. I have used a wiki in the past with a group of international students to provide information to new students (see Internationals FAQ). This project was very successful and I expect similar or better result when using a wiki with a group of students as part of a class. Another way to help students achieve the learning goals I have described above is to provide digital records of lectures. All slides that I use in class are provided to my students at an online course web-site that can be accessed through the Blackboard system (see course information page). Furthermore, for parts of my lectures I provide audio recordings of the lecture that have been created using the Apple iPod (more on iPods at Duke). These audio recordings and slides will be also posted on the course web-site (search for PSY 91 here) in Blackboard. The purpose of all provided online materials is clearly for review purposes and is not meant to substitute class attendance. Therefore, to encourage student attendance during lectures, audio recordings are posted after a longer time delay. Together, the lecture slides and audio recordings provide students with all material they need to review a lecture and prepare for exams. Finally, for specific class projects I provide web-sites with links to all relevant resources for my students. The purpose of such small web-sites is to provide information concerning one specific topic or assignment at a glance and avoid providing too much information that can potentially distract students from their current task. This is another example of my role as guidance and resource for students. While I am available for student questions via email and during office hours, web-sites have the benefit that students can access them according to their own schedule and also when I am not available.