**Hitchhiker’s Guide to the Galaxy... of Learning!**

Learning something new is like visiting a foreign country (or planet) where you don’t speak the language and don’t know the area. Without a ‘local’ to show you around, a visit is often frustrating or even overwhelming. In this regard, my teaching philosophy centers on my role as an educational tour guide, and involves two overall approaches: 1. Have a good guidebook; 2. Don’t let the ‘tourists’ get lost. Together, I utilize these two tactics in tandem to enable students achieve their academic and vocational goals.

**Frommer’s EasyGuide to Education**

We organize information by maps and charts. However, the utility of these tools is directly dependent upon their accuracy and clarity. Likewise, a guidebook is most useful when accurate and clear (*misadventures with GPS devices are an excellent example). Thus, I select course textbooks that emphasize simplicity with informative charts and diagrams over those that lack these features. An excellent example of this idea is Nolte’s *The Human Brain: An Introduction to its Functional Anatomy*, which prominently features comprehensive summary figures with corresponding contextual information. In order to incorporate these materials into the classroom, I transform textbook figures into blank diagrams that students fill-out in class, which become an interactive study guide.

In addition to drawing on information in chosen textbooks, I also create numerous original charts and figures to help students further organize information. For instance, when discussing the organization of the nervous system, students fill out a comprehensive hierarchical chart in class that greatly facilitates information retention (student mastery of this material increased by 50 percent when I began using this chart in class). In fact, charts are so effective as part of a ‘good guidebook,’ that I incorporate them into every unit of each class I teach.

**Teaching ‘Rick Steves’ Style**

Of course, it is possible to get lost even with a good map! Luckily, a well-informed tour guide can easily point you in the right direction. As an educational tour guide, I employ several strategies in order to assess student mastery of difficult concepts. For immediate feedback, I ask for a simple ‘thumbs up/ thumbs down’ from students whenever we go over a new idea, which allows me to assess instantly whether certain concepts need to be readdressed. I take this approach a step further by using student response systems in class, such as iClicker, which allow me to objectively measure student performance. Moreover, iClicker quizzes also encourage student attendance and participation, which is especially important for content-dense courses, such as anatomy.

Along with in-class quizzes, I incorporate interactive, hands-on demonstrations of complex ideas. For instance, students often struggle to fully understanding the complicated interplay of positively and negatively charged ions involved in the generation of an action potential - the language of the nervous system and primary way neurons communicate with each other. To illustrate this idea, I demonstrate the flow of ions in and out of neurons using a document camera (overhead projector) in class. Then, students use coins of different sizes (pennies, nickels, dimes) that are labeled with the appropriate ions (e.g. K+, Cl-, Na+, A-) to physically mimic the flow of various ions inside and outside of neurons before, during, and after an action potential in small groups. During this time, I visit each group to answer questions, and provide clarification.
when needed. At the end of the demonstration, I ask for one student group member to explain the entire process to the class for a few points of extra credit. Peer-teaching greatly increases student mastery of this concept, while allowing me to identify aspects that still require further clarification.

Outside of class, I utilize several different formative assessments in order to objectively measure student knowledge, and redirect student learning. Weekly online quizzes encourage students to ‘keep up’ with course materials, and enable me (as well as students) to pinpoint ideas that may need additional explanation. Furthermore, students complete various homework assignments throughout courses, such as a full diagram of the resting membrane potential and action potential, which further solidify key concepts.

Finally, as part of being an educational tour guide, I continuously look for ways to incorporate new technologies into courses. For most upper division courses, I employ course blogs to supplement ideas discussed in class, which encourages insightful discussion among students (*for two examples, please visit http://psyc4054.blogspot.com/ and http://ucdenver-neuroethology.blogspot.com/). Also, I often post course review questions that students use to quiz themselves on the website, Socrative (http://www.socrative.com/). This resource is especially helpful because students have the freedom to answer questions honestly, without fear of penalty on their grade. Most recently, I began holding weekly online review sessions via the ‘Conference’ feature on Canvas. These conferences provide a platform for students to ask questions (via the ‘chat’ feature) that I answer verbally (via microphone) and visually (by uploading past lectures into the system). Even more importantly, these webinars can be recorded, which students can then watch later for further clarification. In fact, these online webinars are so successful, that student participation (as well as exam grades) dramatically increased immediately after I began to holding these weekly online review sessions. Clearly, these diverse approaches prevent any student from getting ‘lost.’

Bringing the Classroom into the Laboratory

Although I spent a significant portion of my graduate and post-doctoral career in the laboratory, my primary career goal was always to bring the principles and techniques I acquired as a researcher into the classroom. Fortunately, my research background in taste and nutrition provides the perfect bridge for students to gain research experience for several reasons. First, exploring the role of our brains in what we choose to eat is inherently interesting. Not surprisingly, many students want to be involved in my research, and often volunteer their time to contribute. Second, many of my experimental techniques, including numerous behavioral paradigms, require minimal previous experience, or specialized equipment. As such, students can conduct their own ‘mini’ experiments, while learning many fundamental skills of modern Neuroscience.

Moreover, I am actively exploring ways to provide research opportunities for students that don’t require a full-time, long-term commitment. In particular, I am in the process of designing an ‘Experimental Neuroscience’ course that would allow groups of students to conduct individual research projects using some of the more tractable techniques available. Ultimately, I want to expand this idea further by applying for grants that center on teaching and outreach through various funding mechanisms.