

## How do students learn?

New teaching assistants are sometimes given the freedom to decide how they will teach. If you are a new instructor of record, discussion section leader, or lab assistant, that freedom might actually leave you feeling a little overwhelmed and wondering how to approach the process of planning to teach. Let's listen in as two TA's share their ideas about their first teaching assignments.

*Micaela and Kiara are TA's in the psychology department who will both be teaching Introduction to Psychology, a foundational course that also serves as a general elective. As they discuss their plans, they discover that they have divergent ideas about their classes.*

*Micaela says "I don't want to lecture to a bunch of bored students. I want students to talk, argue, debate, and just overall be active at every class meeting. I want them to engage with each other about what they are reading and I want to show them videos they can react to. I think they will learn more if they see that psychology relates to everything from dating dilemmas to climate change, addiction, and even current political and health events. Maybe they can even start to do work together and plan some real research about a question they are interested in! In my experience when students are busy and active, they are more satisfied with the class. I've seen students shopping during class and generally ignoring the professor in classes where I've been the TA. I'm going to keep my students too busy to get distracted like that."*

*Kiara responds, "I have reservations about class meetings and assignments that are focused on student discussion and activities. I've TAed in classes where students talk and work in small groups and I hate to say it, but when you're a fly on the wall in those classes, sometimes students are working and sometimes they're not. 'What are we supposed to be doing?' is what I usually hear! The discussions can drift into some pretty strange places and sometimes the students don't really see the point of the activities. I want to keep my students focused by delivering graspable and well-organized lectures. I think students appreciate it when the teacher breaks down difficult concepts and principles. This is an intro class—they need to learn the key concepts and history of psychology and maybe later in the course they can engage in some debates or small projects when they're ready."*

Take a moment to write down some ideas about what you just read. What is the difference between these two approaches? Which approach do you think is more likely to result in an effective class? After you've given this some thought, let's dig into this conversation a bit and then see what the research has to say that might help new instructors like Micaela and Kiara plan their approach to teaching.

### **The most effective way to approach teaching**

Micaela and Kiara seem to have quite different ideas about effective teaching. Micaela believes that student activity—of any kind—will lead to learning, and she identifies group problem solving as a central feature in her teaching. Kiara, on the other hand, feels that student activity can become confusing and should wait until students have retained foundational information and

concepts. She identifies lecture as the central feature in her teaching. It is not uncommon for new instructors to focus on either lots of activities or lots of lecturing in their classes, and from that perspective the instructors' ideas seem quite different. However, both instructors' ways of approaching their teaching are similar in a fundamental way: Micaela and Kiara are making plans that are largely shaped out of concerns about student boredom or distraction. While these are valid concerns for any teacher, the most effective instructors start their planning by considering how students actually learn!

### **Research-based principles of human learning**

Let's take a look at four key principles from the large body of research on human learning that can best help guide new teachers as they plan their approach to teaching. We'll discover that both student activity and teacher input have a role to play in learning, just not in the ways that Micaela and Kiara think.

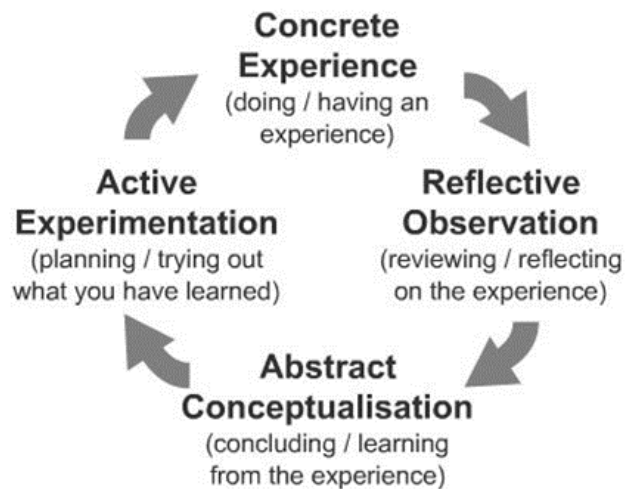
#### ***Human learning requires more than passive listening.***

Kiara believes that lecturing will be an effective method for her students, but the research on learning suggests that even if our goal is for students to remember information, straight lecturing will not result in lasting changes to memory (Brown et al., 2014). The reason is that human beings must process information in order to retain it. Effective processing involves learners manipulating new information, new concepts, or new mental procedures themselves. Lectures that feature a sprinkling of funny stories, interesting graphics, or short video clips don't make students active; rather they simply alert students temporarily and then put them in a passive role as viewer. If we want students to learn and to remember, they need to do meaningful work with information and concepts as part of a larger cycle of learning, as described next.

#### ***Human learning requires cycles of experience, reflection, and abstraction.***

Micaela, like many new teachers, thinks that when students are active, they learn. But simply talking about a course principle or remembering experiences that seem to relate to a course principle will not ensure that there is any meaningful change in how students think or behave. Psychologist David Kolb's work helps us grasp that real cognitive or behavioral change (which is how learning is defined) does involve student activity, but that activity must be both meaningful and be part of a "learning cycle," that is to say a series of teaching elements that work together (Kolb, 2015). The first stage of the cycle is *concrete experience*. In this stage, students must do some realistic work that is similar to the kinds of thinking we want them to get good at. Rather than requiring students to simply chat or bat around idea, students in this stage of the cycle need to attempt the thinking that defines our disciplines by tackling a meaningful disciplinary problem that has more than one solution. The second stage of the cycle is *reflective observation*. After students have wrestled with a concrete problem, they need time to observe their work and reflect on their thinking and approach. This part of the cycle means that students will be able to assess where their thinking is faulty, where it seems successful, or what parts of the problem do or don't make sense to them. At that point in the cycle of a productive activity, students will be ready to hear your feedback. This leads into the third stage of the cycle, *abstract conceptualization*. At this stage, students are ready to begin integrating new ideas from the

instructor or from course readings that show the disciplinary concepts that inform the kind of problem-solving they have attempted. Only at this stage will students be ready to learn from lecture. All this work prepares students for the last stage of the cycle, *active experimentation*. An effective learning activity should challenge students so that as they reflect on their work and integrate your feedback in the second and third stages, they become prepared for and excited about another attempt at a similar problem or slightly more challenging problem. Kolb’s “learning cycle” is usually illustrated in this way:



(Image source: <https://www.simplypsychology.org/learning-kolb.html>)

This notion of the learning cycle helps new instructors see that activity has a place in learning—if it is meaningful, disciplinary work. And it also helps new instructors see that lecture has a place—if it comes to students in the form of feedback *after* they’ve done some challenging work. For example, rather than have students talk about what they thought was interesting in a reading about phobias, Micaela could ask students to decide which phobia in a short list of phobias would be hardest and which easiest to extinguish based on their understanding of the reading. Students first do this realistic work (similar to that of practicing psychologists) and then write down or share how they did their sorting and thinking. After this reflective stage in their learning cycle, students can hear Micaela reveal the best way to sort the list of phobias. Now the concepts from the reading become more deeply integrated and students form a more sophisticated abstract conceptualization of this aspect of psychology. Finally, Micaela can engage them in another attempt at using these concepts: she might have them use these new concepts to analyze a case involving the extinction of a phobia.

### ***Human learning requires interaction.***

Micaela believes that it is important for students to talk together in her class. This instinct is right: the research on learning suggests that when students work with peers whose ideas or approaches contradict, differ from, or complement their thinking, they develop new concepts and abilities (Eyler, 2018). But remember that this occurs when students *work* with peers—not when

they simply talk or chat with them. When students are asked to discuss what they thought was most interesting in a video, it is unlikely that they will have a meaningful disagreement or encounter errors in their thinking. In order to ensure that students have productive interactions that result in real learning, we have to do more than simply get them talking. Productive interactions have three elements. The first element is a realistic and motivating problem. The second element is the consideration of that problem by individual students. The third element is the sharing of individual ideas among a small group of students with the aim of reaching consensus on how to solve, analyze, apply, evaluate or otherwise work with the problem. Let's consider an example. Rather than telling students to get in groups and discuss a video, a better approach to ensure a productive interaction might look like this:

1. Give students 4 possible concepts that might explain the problem that is documented in the video.
2. Ask each student to decide individually what concept they think best explains the problem and require students to write down their decision and a justification for it.
3. Ask students to get into groups of 5-7 and work for about 10 minutes to share their individual answers and reach consensus.

Now student interaction is focused on real work and involves a meaningful debate using key concepts from the course. This is a very different approach than simply keeping students busy. Students will have to articulate their understanding of the concepts and how those concepts apply to a problem that they will have to partially analyze. Further, students will learn how others understand course concepts and will have to analyze their own understanding as well as others' understanding. That's a lot of focused, productive work that results in cognitive change. This kind of interactive work is a great way to initiate Kolb's learning cycle.

***College-aged learners often resist the learning that benefits them most (at least at first!).***

Kiara warns Micaela that when students are asked to do activities, they might be confused or irritated by that request, and she is right to think that students often prefer to sit back and let the instructor do the work for them. But let's consider why undergraduates are often more satisfied to take a passive role in their learning. Many students come to the university after having experienced success in high school by doing a lot of memorizing and note taking. Further, research suggests that most new university students are still in a developmental stage where they hold naïve and undeveloped ideas about the disciplines that they will focus on in the higher education setting (Patton et al., 2016). They don't initially grasp that to work in the disciplines of study at the university means to confront complex and messy problems. This is the reason that many students repeatedly ask what will be on the test or ask that we explain concepts to them rather than ask if they might test out their understanding by describing a concept to us. New university students see learning in terms of memorizing or simply giving their opinions. It might be tempting to reduce their learning experience to simple memorization or lower-level work, but in the end this will simply reinforce students' ideas that learning is both passive and easy. And it will prevent them from potentially developing a real interest in the meaningful work of the discipline you're teaching them. Consider for a moment the kind of research and inquiry you are doing that excites you: that is the kind of higher-level thinking that you should have your

undergraduate learners attempt, at a scale that is challenging but manageable for them. Well-designed tasks that focus on small pieces of disciplinary work, like the ones described above, scaffold students' thinking so that they are guided into deeper application work. When undergraduates are challenged but also supported to do realistic and motivating work, they will be less resistant to and resentful of being asked to be active partners in their learning.

### **Resources about human learning**

Brown, P. C., Roediger, H. L., & McDaniel, M. A. (2014). *Make it stick: The science of successful learning*. The Belknap Press of Harvard University Press.

Eyler, J. R. (2018). *How humans learn: The science and stories behind effective college teaching*. West Virginia University Press.

Kolb, D. (2015). *Experiential learning: Experience as the source of learning and development*. Pearson.

Patton L. D., Renn, K. A., Guido, F. M., & Quaye, S. J. (2016). Epistemological and intellectual development. In *Student development in college: Theory, research, and practice* (3rd ed., pp. 314-335). Jossey-Bass.

If you would like to learn more about using the research on human learning to develop your teaching, we invite you to [request a consultation](#) with ITLAL.