The first time I accompanied colleagues into an operating room and looked down at someone’s living brain, I thought, “*Not everyone gets to see things from this point of view*.” Though fortunately this occurred while I was conducting research and not teaching, the same sentiment extends into my approach to teaching. As a cognitive and computational neuroscientist by training, I am privileged to have at my disposal a background knowledge of how our brains pay attention, learn, and store information. Sometimes, the empirical findings on these topics run contrary to common practice and belief. In my teaching, I implement this knowledge in the following domains to structure a better learning environment and help my students become more efficient life-long learners.

1. *Structure the learning environment to encourage attention and active learning*

When I taught discussion sections for Elementary Psychology courses in graduate school in 2018, I witnessed notable shifts in student attention over the course of the class period. Students with phones face-up on their desks would glance down at incoming notifications and have trouble returning their attention to the front of the room. At the time, it was tempting to speculate that I could hold students’ attention better if I could banish all distraction-producing objects from the classroom, but as James Lang wrote, “*our students are distracted for the same reasons we all feel distracted these days: because we have easily distractible minds, [and] because attention is difficult..*.”

So, to cultivate attention in the classroom I adhere to empirical findings on what practices promote attention and convey to students that paying attention is worthwhile. For example, educational psychology research tells us that classic lecturing does not engage students or facilitate learning as well as we would prefer. When content *must* be presented in a lecture format (e.g., because of class and venue size), as was the case in those Elementary Psychology discussion sections, I break up my presentation with reflective student activities, such as having students write several sentences to a prompt or answer checkpoint questions using their phones. When TA’ing that course, I took time in class and office hours to relate the information I taught about memory and learning (for example, sequence effects, sleep, context-specific learning, etc.) to students’ experiences as learners, pointing out how they could apply that information to become better learners themselves. Students appreciated these strategies, rating my “effectiveness in teaching the course material” as 5.7/6.0, and “the activities and demonstrations done in discussion section [aiding their learning]” as 5.65/6.0. Since 2018, sources of possible distraction have only increased, and while Gen Z learners are experts at tapping into many digital streams and mediums that *can* be informative, like all humans they overestimate their ability to multitask effectively. I will continue to implement these approaches to encourage students to be active participants in their own learning.

1. *Encourage representational competence*

While pursuing my Graduate Certificate in College Teaching in Iowa, I heard an undergraduate student in an Educational Psychology course observe that though they had developed solid studying strategies throughout their college career, they ran into new challenges in an Astronomy class when required to learn the complex spatiotemporal relationships between numerous stars and planets. Challenges like these are familiar to instructors of STEM courses, but it is difficult as an instructor to strategize how to help students overcome such blocks besides explaining the content in as many ways as possible. In an Instructional Design course I completed, I encountered the concept of *representational competence*. Representational competence refers to *the ability to understand, interpret, generate, and translate between different representations of information*, and requires a level of experience with reasoning about complex concepts that novice learners often do not possess. This kind of reasoning is central in cognitive and computational neuroscience research, but students who are not experienced with this kind of reasoning can become discouraged and fall back on rote memorization instead of building their understanding of advanced conceptual relationships.

Fortunately, I am well-equipped to address this issue in my classes in part because of my technical expertise. Simulated models or figures can serve as temporary external representations of mathematical or conceptual relationships to help students learn as they build their own internal cognitive representations of complex STEM topics. One way I implement these tools in the EEG/time-frequency analyses workshops I teach is to include a practical demonstration in which I work through a piece of MATLAB EEG or LFP analysis code with students. I explain each line of code and encourage students to change code inputs, and together we generate data figures that help them map geometric components of the data to the equations used to analyze and transform them. Similar tools can also be made accessible to students through open-source programming tools and platforms like Python and Google Collab. I gained experience teaching using these tools as a TA for Neuromatch’s intensive three-week summer Computational Neuroscience course. The ability to look both at the coded implementation of equations and manipulable figures of output data or simulations helped students grasp new computational topics and ask clarification questions more easily than with one representation alone.

In future instruction, I will continue to use code to create models that students can manipulate as they learn neuroscientific mechanisms and methods. This also provides students with a hands-on, lab-like experience in psychology and neuroscience courses that do not include a built-in lab research aspect.

1. *Promote metacognition about learning*

I choose to teach the way I teach not only because it is empirically effective, but also because I want my students to be better prepared to learn in the future. College students are driven, curious individuals, but do not arrive in their freshman year with perfect learning and study habits (as any professor will tell you during the influx of first-year students to office hours following their first college exam). This is why it is critical to teach students how to monitor and evaluate their own learning. Whenever I teach concepts that relate to learning, I take the time in lecture to explain how those topics relate to students’ own learning. For example, many college students employ “cramming” study methods, though mresearch tells us that short, spaced study sessions with sleep occurring in between help our brain learn more efficiently. While introductory psychology courses are an ideal venue for teaching students how to be better learners (because these topics come up in the course content already), the same principles can be easily applied in most psychology and neuroscience courses by connecting course content back to student learning and inviting students to consider how that knowledge can make them more efficient learners.

The benefits of teaching students how to be better learners are obvious for first-year students in introductory courses, but these practices also benefit advanced students who are preparing to enter a job market that increasingly values ability to learn and apply skills on-the-job over declarative knowledge which may become obsolete. AI tools have changed the educational and professional landscape permanently and will continue to do so. I believe that students who can monitor and evaluate their own learning will be better prepared to leverage these tools effectively in ways that enhance instead of hinder learning. For example, I encourage undergraduate and graduate mentees in the lab to use tools like ChatGPT and CoPilot when programming code when using new functions or writing novel analyses but emphasize the importance of testing code output line-by-line and ensuring understanding of the generated code. I regularly go through their code with them to ensure they use these tools effectively, and to ensure they are developing practices for testing their own understanding of the methods.

I want students in my courses and mentees in my lab to learn not only content and methodological approaches, but also critical and scientific thinking skills that are strengths of psychological and neuroscience disciplines. It is my hope that the students I teach practice seeing the world from the point of view of a neuroscientist and leave my instruction better for it.