Perspective / Opinion

How Taking Clinical Human Anatomy Alongside the M1 Students Helped me Better Understand the Future of Medical Education

By Ethan Duwell, PhD

Dr. Duwell, one of the inaugural Kern Institute postdoctoral fellows, went "back to school," taking M1 Human Anatomy. In this essay, he contemplates his experience and how it might inform what the educational process requires to be transformed …

It's 9:00 AM, 45 minutes remain before the first anatomy exam begins, and I'm going to fail. I find myself paging manically through my notes in a caffeinated frenzy, scanning labeled diagrams of the brachial plexus, re-reading practice questions, and reciting mnemonics as though these incantations may somehow ward off what I dread.

How did I get here? After all, I took Human Anatomy and Physiology as an undergraduate, completed dual majors in Chemistry and Philosophy, and recently earned my PhD in Neuroscience. *Shouldn't I have mastered this course-taking business by now?* If nothing else, the previous two-and-a-half humbling decades I have spent as student gave me a keen awareness of the limits of my own knowledge. I am fully aware where I stand on this material, and it sits like a weight on my chest.

I am one of two inaugural postdoctoral fellows at MCW's Kern Institute. After graduating from St. Olaf College, I briefly considered becoming a physician, but ultimately pursued a PhD in Neuroscience after working two years as a research assistant in Neurology at the Mayo Clinic (Rochester, MN). Many factors played into my decision to pursue research and academia instead of medicine. However, most of them boiled down to the realization that I was always drawn toward the unknown, exploring the questions which lie beyond our current understanding.

I'm most enchanted by the mysteries surrounding how conscious experience, sensation, and perception arise from human neurophysiology, as I shared in my recent poem in the *Transformational Times.* This passion began while studying philosophy and is what ultimately led me to the Neuroscience Doctoral Program at MCW where I studied under Edgar A. (Ted)

DeYoe, PhD. In Ted's lab, I received broad training in cognitive vision science and focused on fMRI imaging techniques for mapping the organization of human visual cortex. For my thesis, I developed novel fMRI paradigms to characterize the effects of central visual system miswiring on cortical organization and function in people with albinism.

Teaching methodology and practice ("pedagogy") has long been an interest of mine. I was truly fortunate to have great undergraduate basic science teachers. Research opportunities at small liberal arts schools are relatively limited, so the faculty tend be committed to quality teaching. My philosophy and science professors at St. Olaf were, simply put, wonderful educators. Their enthusiasm and the classroom environments they created brought the content, ideas, and questions to life in a way I had never experienced. They instilled a deep appreciation for quality teaching and a respect for the profound impact educators can have on the lives of others. From the beginning, I'd always seen teaching as part of my eventual career in Neuroscience.

In graduate school, however, I was surprised to discover that cultivating teaching excellence was uncommon and, even, somewhat taboo. I reached out to my undergraduate professors for advice. "What might I do to explore my teaching interests in graduate school?"

Their answer surprised me. "Don't even mention this interest until a few years into the program."

"Why?" I asked.

"Because teaching isn't aligned with the financial and academic interests of a basic science lab. It's time consuming, it doesn't bring in grant dollars, and it doesn't produce data or publications."

My former mentors warned that by expressing my interest in teaching up front, I may implicitly signal that I'm not fully committed to research which could affect my lab opportunities early on.

After my first year of graduate school, I volunteered as a teaching assistant in the M1 Medical Neuroscience course. I found this informal teaching environment both refreshing and rewarding. Beth Krippendorf, PhD, and the teaching faculty involved in this course showed the same enthusiasm and commitment to education that had inspired me as an undergraduate. As a TA, I found vicarious satisfaction in helping others learn and explore, and realized that teaching was an alternative, meaningful way I could engage with the content I love.

As I moved through graduate school, I became increasingly familiar with the inner workings of running a research enterprise and the reality of what my life might be like once I completed training and became a principal investigator (PI) in my own lab. Paradoxically, I found myself more in love with the science and the labwork than ever before, but less sanguine about becoming a PI. Most PIs have little time for bench science and, instead, spend much of their time as administrators and grant writers. Competition for funding is fierce and there are more basic science PhDs than federal funding opportunities.

As someone with a passion for teaching, I saw a life working in basic science to offer some conflicts. Teaching is a skill set unto itself which requires training, commitment, and dedication. While no one ever explicitly discourages researchers from spending time learning to become outstanding teachers, the time and effort required to master these skills is far less valued than the process of discovery, the acquisition of content expertise, and the maintenance of funding. As I spent more time in the lab, it became clear that acquiring and mastering teaching skills would require dedication, practice, and intentionality. My undergraduate professors were correct that there is conflict between the interests of pedagogical excellence and the business model that funds basic science research. That is what motivated me to pursue my current education-oriented postdoc role at the Kern Institute.

As it turns out, I did not fail that first anatomy exam nor the course. I passed by the skin of my teeth. Having spent time in lectures and cadaver dissections shoulder-to-shoulder with medical students, I have gained practical experience in medical education from the students' perspective. And, having worked in research labs and having seen how education works from the basic science side, I know that world, as well. I hope to use my experiences to influence curricular design by aiding in the ongoing basic science curriculum "reimagining process."

We will learn much along the way, of course. Socrates famously noted the importance of acknowledging what we don't know in Plato's *Apology:*

> "It is likely that neither of us knows anything worthwhile, but he thinks he knows something when he does not, whereas when I do not know, neither do I think I know; so I am likely to be wiser than he to this small extent, that I do not think I know what I do not know."

His thoughts are still applicable. Despite common misconceptions, we scientists are not simply repositories of knowledge and information. Instead, like Socrates, we must be question-askers. We investigate and explore, continually finding ourselves forging the path forward at the boundary between understanding and the unknown. Against this boundary, our humble awareness and acknowledgement of what we don't know is of equal or greater importance than what we do.

As we move forward, we will learn to ask questions together that will be truly transformational. We will help all our teachers, both the basic and clinical scientists, to succeed. Our students and their future patients will benefit.

Ethan Duwell, PhD, is a postdoctoral fellow in the Robert D. and Patricia E. Kern Institute for the Transformation of Medical Education.