Accelerated Transitioning to Full-time Distance Teaching: College Sophomore-level Human Physiology Due to COVID-19 Pandemic to Year-2020

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▶ Abstract

A major impact of the Covid-19 pandemic is the immediate transitioning from classic, in-person to distance, online teaching. To manage this transition, professors like myself had to simultaneously realign instructional objectives and evaluate available technologies that best fit their personal styles and course needs. This unprecedented challenge was especially compounded in topics such as human physiology with its scientific intricacies and hands-on lab components. Thankfully, the High Impact Online Teaching Learning Practices (HIOTLP) course offered a venue where we were able to not only review pedagogical themes and alternatives, but also share ideas and experiences with numerous other colleagues facing such monumental transformational journey.

Course Information: Human Physiology, PSLY 2040

▶ Narrative

My accumulated instructional experience of more than nineteen years and decorated with multiple excellence awards, was suddenly challenged by the monumental transition mandated by the Covid-19 pandemic. Having become the senior anatomy and physiology professor in my academy I had gotten used to my inventory of instructional tools being placed in convenient locations not only for my own use but also for training incoming faculty. Luckily, I had already obtained institutional certification for online teaching, although the plan to use it was not on my radar for the foreseeable future as I had become too used to a daily routine of walking up and down the steps between classrooms, labs, and meeting rooms. In a small institution such as Chicago State University, such routine was accompanied with the inevitable daily encounters with students and colleagues where smiles, short conversations, and exchange of greetings complemented the classroom dynamics. This is indeed why the sudden switch to online teaching was such a challenge.

It was not until four out of nineteen students in my Human Physiology remote-teaching course tested positive for COVID-19, that I genuinely realized that the hard work of swift transitioning to online teaching was the only alternative. This hard reality was further compounded by the fact that physiology labs utilize medical devices and setups that are the antithesis of the post-Covid-19 social distancing mandates. This is because the experimental setups involve the students taking measurements on each other as the subject then switching roles after an

introductory demonstration by the professor. Both the demonstration and measurements routinely require close personal contact because data acquisition relies mostly on laptop-tethered physiological sensors with relatively-short-wired leads. To be specific, standard human physiology experimental sensors include skin electrode stickers for electrocardiogram (ECG) and electromyogram (EMG) recordings, finger-wrapped monitors for pulse measurement, arm cuffs for blood pressure measurement, and mouthpieces and nose clamps for spirometry. While all these setups are impossible to reconcile with social distancing, the immediate risk of direct virus infection in the spirometry lab is most obvious as the students need to breath directly in and out of the shared apparatus to take measurements! Simply thinking about the immense infection risks of such proximity left no doubt in my mind that swift transition to online instruction was the only viable alternative.

My immediate goal in the initial stages of the transition was to create a distance learning environment with the highest-level of normalcy for my students and myself. Towards this end, I created a home-based classroom with all the needed infrastructure. This included a touch screen laptop and a white board for interactive instruction through PowerPoint annotation and real-time sketching and diagraming along with a high-resolution webcam and external speaker for clarity. To minimize interruption, I switched my home network to fiber optic and invested in a backup power supply. For labs, I used the same setups we usually use with a modification of lab learning outcome where knowledge of experimental protocol was enhanced by videotaped experiments being made available on my private YouTube channels along with extra online training for data presentation and analysis.

As I grew more confident in the world of online teaching, my next goal was to expand my horizons and tap into the latest standards and inventions in the world of online instruction. This is indeed where the HIOTLP course could not have come at a better time. Before the HIOTLP course, my experimental demonstrations were limited to the lab sessions where I performed the experiments twice: first, synchronously during live online lab class sessions, then asynchronously through narrated video recordings of the experiments made available to students through web links to my private YouTube channel along with relevant documentation, tutorials, and lab report rubrics.

With the help of the HIOTLP course, I was able to drastically modify my approach, as I learned to split my lecture in two halves separated by breakout rooms where students collaboratively worked on research or practical questions and/or mini experiments and practical demonstrations. Additionally, lab class sessions included breakout-room assignments that were designed to allow students to explore relevant experimental protocols and experimental variables as well as engage in relevant data analysis or expand on that day's experimental theme. Such approach, added depth to the topics, allowed students to compete in groups, and created opportunities for students to work with, and know their classmates. This further allowed me to implement a big lesson I learned in the HIOTLP course, namely creating an inclusive learning environment that fostered healthy student interactions and engagements. Ultimately, these modifications were supplemented by modified assessment parameters and course design themes that added up to a student-centered remote-learning experience with a relevant modified syllabus and rubrics that added up to my HIOTLP course "deliverables."

Ultimately, these course design elements were so much on target that I intend on building on them and integrating them in other courses, as they have so far generated tremendous student

enthusiasm, engagement, and success in tangible and intangible ways that include the points discussed in the conclusion.

▶ Summary/Conclusion

First, one HIOTLP course deliverable was my modified syllabus which was so incredibly successful that starting on day 1 of the synchronous course and during my introduction and syllabus discussion, several students expressed their pleasure about my promise of inclusion and the kind of syllabus details and sentiments that they have never seen anywhere else, with one student pointing out that she was so pleased to see a syllabus specifically designed for them rather than being passed on from year to year. My quick capturing of such a glorious comment, among others, was the spark that generated so much energy that propelled an amazingly positive tone along with a sense of trust and community that I deliberately fostered throughout the semester by calling on students by name and praising their respective efforts.

Second, my HIOTLP-guided course design tremendously enhanced student engagement. Specifically, assigning personalized reflection reports for every lecture not only took away the burden of taking attendance but also made sure that the students were taking meaningful notes.

Third, my HIOTLP-inspired lecture planning started with a ten-minute interactive review of the previous lecture followed seamlessly by the new material then leading to a 2 to 3 question in-class group activity where students are randomly assigned into groups of 3 to 4 to work together and answer the questions. Towards this end, I provided the students with my detailed tutorial on how to use the collaborative tool Google Jamboard and save their work as PDF files. Having seen students' enthusiasm, energy, teamwork, and quality of work was quite rewarding. Indeed, the ability to engage students through this kind of activity gave online teaching an edge over face-to-face classes as it not only created a sense of community amongst my students, but it also fostered creativity as it gave the students an alternative mode for expressing themselves, collaboratively researching, and artfully answering questions and sharing their thoughts.

Fourth, follow up with students, especially those who lagged behind or missed lectures, helped several students: one who acknowledged that she would have dropped out of the university if it were not for my follow-up, another whose progress was improved after I found out that her computer was damaged and helped her get a computer loaner from the university, and another student who had too many science courses and a full-time job and needed referral to an academic advisor.

Despite the hard work of navigating through the previously uncharted roads of online teaching, I strongly believe that the work is tremendously dwarfed by what our students are going through. To put things in perspective, here is a testimonial from one of my out-of-state students who is one of the aforementioned COVID-positive students and had to deal with being sick and quarantining alone in a campus dorm-room (when I had a couple of online office-hours and follow-up zoom sessions with him): ". . . You're an awesome amazing teacher. I took this class while battling . . . Covid mental health . . . I thank you for wanting to see me succeed. 2020 hasn't been the best year for anyone especially me. I didn't deserve to be in your class

and the fact that you gave opportunity after opportunity too and for that I thank you. I appreciate you for understanding . . . Thanks for believing in me and I'll see you next semester at my best."

Finally, the advantage of the HIOTLP experience was not only immeasurable for this semester, but it also provided me with a repertoire of resources and network of colleagues and mentors to expand my experience and enhance all my courses. This is while continuing to work on redesigning my test banks to reflect the changes that I have made not only to improve consistency but also to align with the required standards for the courses in accordance with relevant accreditation parameters and board tests.