Teaching Philosophy Statement

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Introduction

I do not view the connection between instructors and students to be a one-way path where instructors try to infuse knowledge into students' brains and, at end of the course, instructors evaluate students' success based on their exam performance. Instead, I envision teaching and learning processes to be highly interactive and complementary. Having been a student for years, my primary task is learning. But I have also found it effective to learn through explaining and discussion. As an instructor, I believe our duty is not merely presenting static knowledge but to interact with students and to facilitate their learning. Throughout the years of my academic training and learning, I was fortunate to teach an in-person class and an online class. I felt challenged yet I learned how different they are and how I could adapt myself to the two styles of teaching.

In-Person Teaching

I was the instructor for GEOG 365, *Introduction to GIS Programming*, with around twenty students. This is an intermediate level course involving programming and basic statistics. It teaches students to carry out spatial analysis and visualization with R. Students are sometimes afraid of programming courses because they are used to a user-friendly environment as on tablets and smartphones. Things usually just work out-of-the-box and do not need too much tweaking. This course, however, is one of the required courses in Geography and I certainly felt some level of discouragement when I was introducing the course syllabus.

In fact, students usually do not come into classes full of curiosity and passion. I believe it is my responsibility to intrigue them and encourage their learning. I usually adopt different strategies for courses of different nature. GEOG 365 is a major-focused course and I took a skill-oriented approach. I held a series of lectures and in-class discussions with sub-groups. Since the goal of the course is to prepare the students for further and higher-level classes, they need to spend a fair amount of time to memorize key facts and to establish a solid knowledge foundation. This process can be challenging for students because, during the early stage, they might be overwhelmed with new information and they are very likely not able to see the connection between information and a bigger picture. During GEOG 365, I often got questions like "Why should we learn this data structure? Is it enough that I know how to use the tool?" and "How important is it to distinguish a vector and a list in R?" I usually would explain and expect an even more confused face. This would be one of the typical moments when I would then say "Remember it as best as you can and you will see later on in the class."

During this process, I have found mind maps to be effective at visualizing a knowledge structure. I usually start with isolated dots, each representing key information, and then develop a tree structure by connecting these dots. Students usually do well at recalling the definition for a data structure but would then fail miserably at choosing the correct data structure to solve a specific problem. I call this situation *the isolation of information*. In this case, students need help to build connections between the information they have memorized. It has been shown that students respond better to a graphical representation than to texts and that is the exact purpose of using a mind map during my teaching.

Having group projects is another efficient strategy for skill-oriented courses. Group projects assess students' ability to apply knowledge to problems. In a programming course, I would prefer group projects to final exams because programming is essentially a hands-on task through trial and error, and the process is highly interactive. I believe "whoever does the most of the work gets most of the learning", and in such an information-rich course, students should have enough practical experiences to develop a solid skill basis.

Online Teaching

An alternative to the major-focused course is the general education course. I was the instructor for GEOG 160 WEB, *Mapping Our Changing World*. While this course still belongs to GIScience, it has a broader scope and impact as a social science general education course. It was offered online on the Canvas platform with around eighty students.

Online courses are all about asynchronous teaching and learning. They offer students and teachers great flexibility in terms of course schedules and locations while also presenting great challenges in areas like effective teaching and active student participation. Due to the course being online, there are usually more students enrolled in the online version compared with the in-person option. As a result, students might come from a wide range of educational backgrounds. Some students might already be familiar with the content and feel under-challenged while others are struggling and overwhelmed. To address this issue, I usually give an entry quiz during the first week. I believe quizzes are effective in showing course expectations and requirements. Although it might spread a sense of anxiety among students at the very beginning, I strongly hold that it is better earlier, rather than later, to expose many problems so that students can choose accordingly and instructors can adapt promptly.

Another strategy I usually take is to introduce to students the idea of the comfort zone, the learning zone, and the panic zone, and I constantly refer back to these classifications throughout my teaching, online notes, and discussion posts. For example, the Geographic Coordinate System can be categorized into the comfort zone since it is well-known and straightforward thanks to the various map applications like Google Maps and OpenStreetMaps; I would then categorize projection into the learning zone because students might not anticipate there are various projections, each with their own strength and weakness while still sharing some level of similarities; finally, I would categorize the Global Positioning Systems into the panic zone for this course because it involves understanding in remote sensing, signal processing, and statistical error correction which can be well beyond the scope of this course. I constantly ask students to post their own perceptions and assessments with these criteria and to evaluate how they think themselves are making progress. I could also add extra recordings or external materials based on students' feedback.

Online courses give students the possibility to take the classes at their own pace but it is hard for students to stay focused because distractions are simply one-click away. GEOG 160 WEB adopts recorded videos and online notes so I was not able to directly interact with students during classes. As an alternative, there were weekly discussions and I also set up a virtual student lounge aside from the regular office hours. These weekly discussions also serve as reminders for students to spend time on the online course on a regular basis. Proper planning is key to the success of an online course. Since it lacks the in-person interaction between lecturers and students, students are more likely to fall off track. It is important to make the course schedule and the syllabus available ahead of time and also easy to find. Tools should be publicly accessible and well-tested. Last but not least, external links should be carefully examined and update to date.

Summary

Instructors should not be limited by simply demonstrating knowledge. In my opinion, we are *visualizing* knowledge. This idea originates from the book of Ambrose et al. (2010) titled, *How learning works*. When knowledge is connected with a structure, it lasts longer in our memory and it is easier to be applied. We, who have already built our own knowledge system, need to show students not only facts but also how to connect dots and internalize information. While students are unique in their own way and they have different approaches to learning, we should show them the expectations, rather than the exact path. We then help them to learn, providing information piece by piece that we think would encourage their understanding.

David Lynch once wrote, "*a path is formed by laying one stone at a time*". I remember being a student, I was always overwhelmed by the amount of knowledge I need to grasp and the sheer number of tasks I need to complete. Now, as an instructor, I am eager and passionate to guide them and help them place "one stone at a time". I will be learning together with my students.