Teaching Philosophy – Ben Horne

My philosophy is to teach practical, industry demanded skills while emphasizing ethical perspectives and designing systems with well-being in mind. The progression of my courses in the undergraduate major emphasizes this: First, learn about the unintended consequences and harms from building information systems and services (INSC 201). Second, learn the technical skills to build those systems (INSC 360 and 484). This idea is inspired by Anna Hoffmann's 2018 article on data violence - referring to harmful outcomes as the result of choices that are made implicitly and explicitly. By first understanding what can go wrong, then obtaining the skills to build, I hope to create an ethical and skilled work force.

In terms of teaching technical skills, I have two core principles in my teaching philosophy: 1. repeated fundamentals and 2. context to intrinsically motivated goals.

Repeated fundamentals.

In data science and analytics, I believe that understanding the fundamental principles behind a task is more important than understanding the latest software or programming language used in completely that task. Throughout a student's career post-degree, technology and tools used to accomplish a task will change. If students are to adapt quickly to the market, they need to understand the underlying principles. For example, rather than knowing the language Python, students should know principles of programming, even if they are learning those principles using Python.

I think learning the fundamentals can be accomplished through repetition (practice makes perfect). In my own learning experience, I have found that mastering any task comes with repeated practice. Often when I was learning technical skills, I had to motivate myself to repeatedly practice a task, whether that was taking derivatives in calculus or writing a program from scratch. I think classes can be better designed around this idea that practice makes perfect by providing multiple opportunities to see and practice a technique.

Context to intrinsic goals.

While learning the fundamentals is important, it requires context. It is the question frequently posed by students, "when will I use this in real life?". Often, we give one or two generic examples, but it is unlikely to motivate all students. I believe that more students can be motivated by providing a framework to find their own independently motivating use-cases of the task being learned. This method is supported by the work my colleagues and I published at MIT Sloan Sports Analytics Conference in 2017, in which we had students who were intrinsically motivated to be better at basketball. Using this motivation, we had students use basic statistics to identify spots on the court where they needed to work on shooting. Importantly, this was not us showing them where they needed to improve using statistics, but their own data collection and analysis showing them where they needed to improve. Thus, the students were motivated to learn what were previously "boring" and "useless'" topics because it could make them better at basketball.

Support by Analogy

 These two core components are supported by an analogy: learning and practice in sports.

Repeated fundamentals. All youth sports start with repetition of the basic concepts, whether that is passing the ball, moving around the field/court, or dealing with the essential rules of play. This repetition of basic concepts doesn't stop after youth sports but extends all the way up to the professionals. A great example of this is the preseason training of Tom Brady, arguably the best quarterback to play professional football. After 20 years of playing professional football, Tom Brady still begins the year by repeatedly practicing handing the ball to his teammates. He is not throwing the ball, he is not working on complex

defensive reads, he is simply handing the ball off to the running back. In professional baseball, a similar practice is done with batting, in which players repeatedly hit the ball from a batting tee to start the year. This task is the same task done repeatedly by five-year-olds learning the game.

Context to intrinsic goals. Perhaps more importantly, Tom Brady knows why he is repeatedly doing this basic task repeatedly: it will win more games (the intrinsic goal). Handing the ball repeatedly to a teammate builds muscle memory which decreases mistakes in games and increases the number of games I win. If we can make the intrinsic goals clear when students are learning fundamentals, they are more likely to stick with it when things get difficult and in the end meet their goals.