Aaron Dutle
Teaching Statement

Teaching has always been an integral part of my career. I have taught mathematics as a supplemental instructor, a graduate teaching assistant, an adjunct professor, and a research assistant professor. I've taught a wide variety of courses, ranging from Basic Algebra through a senior level topics course in Discrete Optimization. Through experience and study, I have become an excellent educator. My teaching evaluations attest to my abilities, as I've consistently scored above 4.5 on a 5 point scale on the "Instructor Evaluation" portion of my course evaluations.

I attribute my success to a two-prong approach to teaching. My day to day methods are grounded in simple, reliable techniques, while my planning for courses is guided by the principles of educational technology and instructional design.

For everyday teaching, I use tested techniques to keep my instruction clear, and my students interested and always learning.

At the beginning of each class, I lay out the goals and main points for the day, so that the students know the objectives for the day. I ask if there are questions from the previous day or the homework, so we're not moving on before the students have grasped the content. I pause often during class evaluate student comprehension. Sometimes this means answering a direct question from a student, explaining a concept from a different perspective, or working with another example. Other times I ask the students to explain a concept or procedure themselves, so that I can see the causes of any misunderstanding.

I use proven techniques to maintain student interest. I use a story or interesting problem to get the attention of the students and provide relevance before delving into the details of the mathematics. I keep the students involved. I have them help me work through the examples, or anticipate the next steps. I ask students to work and explain examples for the rest of the class, both to break up the monotony of me in front of the class, and to have them learn to communicate mathematically. I have the students work with each other both in and out of the classroom. I use technology in the classroom, both to show more realistic and interesting examples, and because a good illustration sometimes provides the best explanation. For example, when teaching the simplex method for linear optimization, performing 9 pivot operations on a 5×10 matrix to find an optimal solution is terribly tedious by hand, but easy and instructive with a computer. For the same problem, plotting the feasible region for solutions to a systems of 5 linear inequalities in 3 unknowns is a great and complex 3D illustration, and helps students see *why* we use the simplex method instead of finding the solution geometrically.

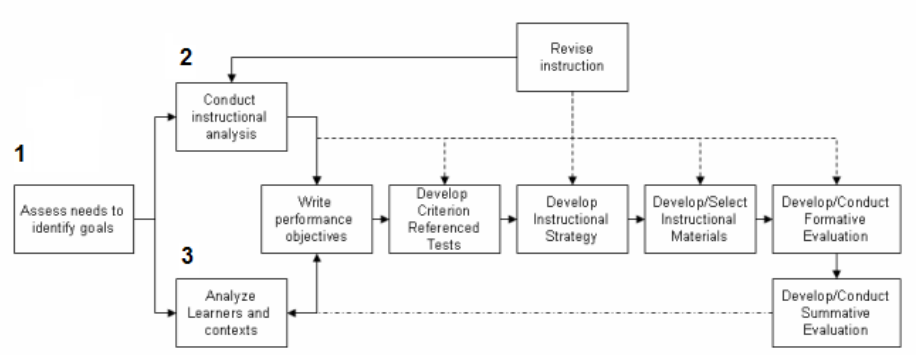
I try to provide something for students of all levels, and challenge them to achieve beyond their comfort zone. For example, in my Discrete Optimization course, I have problem sets that contain both simple calculation problems and somewhat involved proofs. The students are asked not only to solve those that they can, but also to present and justify the solutions to the class. In this way, even simple computation problems can be an exercise in deeper understanding for less advanced students, while the advanced students still have challenges to keep them advancing.

For course design, I rely on the skills I learned as a master's student at Texas A&M, where I studied educational technology and instructional design along with mathematics. Educational technology encompasses the study and evaluation of all aspects of how education is designed and implemented, from the choice of textbook to the analysis of learning styles, and all points in between. In designing my courses today, I use many of the techniques learned in these classes. Two techniques that I find especially useful are rapid prototyping, and the Dick and Carey systems approach model [1].

Rapid Prototyping is essentially a way to quickly try out a technique for instruction without fully committing to it. In the very early stages, I might show a very rough idea or demonstration to a colleague to get early feedback on if the idea is feasible at all for instruction. For example, I might show them a computer program I'm considering using in the classroom, and have them try to navigate it. If it passes this test, I'll refine it to a one-lesson use of the technique, and try

it in an actual class. If this goes well, it may be further refined to be something used on a day to day basis in future classes. I recently employed rapid prototyping before using the "modified Moore method" in my Discrete Optimization course this semester. I attempted the technique, where students are responsible for developing and presenting some of the material, during one class period in the previous semester. It was effective enough that I refined it for use over an entire semester course.

The Dick and Carey systems model approach is a way to design and refine a course, or any instructional module. I use it before a course starts, to create a layout and tone for a course, and to keep focus on the concepts and skills students should be able to take away from the classroom. The general idea follows the diagram below.



Without going into the technical details of each step in the above process, the reasons why this approach produces excellent course design are these: It forces the designer to focus on the goals of the instruction, how to get the students there, and how to know the goals have been achieved. It does this before a single lecture has been written, or homework problem assigned.

The process is somewhat time-consuming for a first-time course, but the goal oriented nature of the approach makes the class more focused, and keeps students and myself as the instructor on track. I find that it also allows for simple improvement of a course that is taught a number of times, as the evaluation stages can guide alterations to the course the next time through.

Using simple classroom methods, guided by careful course planning based on instructional design theory, has made me an excellent teacher, and give me confidence in my abilities to design and teach new courses as well. The reasons above are compelling, but the real evidence of my effectiveness is seen in the following selection of comments by former students.

"He was clear, precise, and very available and approachable"

"Aaron Dutle is an excellent teacher. He engages the material and teaches efficiently."

"Dutle was very keen on the material, gave good examples and helped everyone learn"

"I thought his teaching style was good and made us comfortable enough to ask questions. He really seemed to enjoy what he was doing"

"This instructor is fair and taught the material in a clear manner so we can understand it. He is very knowledgeable with the material he covers."

"Teacher was very helpful and straightforward about the content of this course."

"Knows the subject well and explains material thoroughly. Comes up with funny examples! Exams are very well done and cover a good range of difficulty."

"Teacher was very knowledgeable and effective at passing that knowledge to students."

References

[1] Dick, W., & Carey, L. (1996). The systematic design of instruction. 4th ed. New York, NY: Harper Collin