

Teaching Philosophy

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Consider a regular undergraduate mathematics course that I teach. Over the course of the semester, I will present many blocks of material to my students. Most students will not completely comprehend a block of material immediately after initial exposure to it; they will have interstices in their understanding. After presenting the material, my task is to fill these interstices. Although the methods that I use to accomplish this task depend significantly on the format of the class, this task itself does not change.

If I spend most of a regular class period lecturing to my students, then temporal constraints prevent me from filling more than a small fraction of these interstices by answering the questions of students. Whenever I led discussion sections connected to a large lecture format, I spent virtually all of my class time with my students not presenting course material, but answering questions about the aforementioned material. The students loved it because answers to questions, though minor by themselves, often transformed whole blocks of material inside their heads from incomprehensible to comprehensible.

Consequently, whenever I am the principal instructor for a large lecture class, I instruct my teaching assistants to spend as much of their time with the students as possible answering the questions of the students. I present all of the course material during the large lecture. When the students attend their respective discussion sections, they have interstices in their understanding. The best way to fill these interstices is to have the students indicate where they are by asking questions.

One of the enjoyable aspects of teaching a course at the University of Illinois at Urbana-Champaign which utilizes Mathematica is that I can spend much of my scheduled time with the

students filling the interstices in their comprehension of the course material. Sometimes, I will only need to give them the tiny hint that they need to move forward; not knowing those tiny hints is enough to terminate progress. Other times, I converse with a student for many consecutive minutes, carefully explaining and elaborating a body of theory or an illustrative example. The students indicate to me both how much and what kind of help they need; when they need no more help at the time, they indicate this to me and I then move on to help someone else.

After exposure to the requisite material for solving a mathematical problem, many students will be able to create solutions to the problem that are almost complete, but possess some debilitating flaw such as a logical error or an omission of a necessary component. To fill the interstices, in the context of this essay, is to provide these students with the apparently minor but positively crucial fragments of enlightenment that they need to complete their solutions, as well as their own understanding.