

COMPILATION: advice about giving a short workshop on Modeling Instruction

Date: July 2000

From: Patrick Daisley <patrick@DAISLEY.NET>

I have been asked to give a presentation next week about modeling to a group of 7-10 grade teachers, mostly 8th and 10th. It is part of a 1 week science teacher institute my district is holding. Teachers are learning ways to implement the district's new integrated 7-10 science program.

Since I have gone through the modeling workshops (UC Davis 98/99) I have met with mixed enthusiasm about modeling from my colleagues (up to and including outright disdain). I believe this is because I have failed to truly give them an accurate picture of the process--they can't see past the probes and whiteboards. I tried to lead my high school through the 10th grade physics units this past year, adopting some of the material from units 2-5. Most of the teachers quickly fell back into lecture mode, if they tried to get out of it at all, and were not very pleased with the unit. They complained about it being too hard and taking too long. (I reduced the math component and focused on interpreting graphs and on the concepts of position, velocity, acceleration and force.) Again, I don't believe they really understood how to teach it.

So, here I am with the "opportunity" to present to a larger group of teachers from 5 high schools. I only have 45 minutes and I don't want to do the cause any harm. If you can give me some feedback on this, and any sage advice, I would appreciate it!

My tentative plans:

Give the teachers some cooked up data from a constant velocity (or accelerated velocity) lab. Doing the lab would take all the time, but I would provide them with written material on how to conduct the lab.

I would then have them graph the data on whiteboards, determine the slope and intercept and be sure to use proper units. (Linearizing would need to be done with the accelerated motion-10 graders. In my experience most of our 10 graders, and their teachers, would not be able to do this easily).

They would then present just as the students do, with me in the role of questioner and facilitator, encouraging them to question each other. I could give several groups deployment exercises to whiteboard so that we could see several presentations about different things.

QUESTIONS:

1. Is this an OK approach? Can you suggest a better one?
2. Am I right in not using any computer technology here (motion detectors)? I am thinking that it's better to have real data points to work with at first.
3. Would I be better off just giving a presentation?

Thanks for any help you can offer.

Date: Fri, 7 Jul 2000

From: Kathleen Andre Harper

To me, this sounds like the right way to go. I have given a lot of different presentations on modeling and on other topics where I wanted to incorporate bits of modeling. I've found that the ones where I actually get the audience active in the modeling process are much better accepted. (So the answer to question 3 is a definite no, at least based on my experience.)

I gave a couple of short sample teaching presentations a few months ago when I was on the job market. I found that *a modeling approach to Hooke's Law, with a few disclaimers at the beginning (e.g. "You already know what forces are.") works really well in a compressed time setting.* I was able to cram it and a small presentation into half an hour, although it was tough!

I also chose to go with the *no technology* route - I didn't want the computers to obscure the method, since it's a one-shot deal. I also didn't want to have to worry about having to teach people how to use the technology or about having problems with the computers, since the time frame is really too short to allow time for those things.

Date: Fri, 7 Jul 2000
From: Jerry Loomer <jerryloomer@HOTMAIL.COM>
Patrick,

My thoughts go to the fact that *hands-on is best*. I suggest having the computer interfaced to a smart pulley (or motion detector) and the lab ready to go. Explain the setup, what you are going to do, and then let the battery powered vehicle move as the computer collects data. Hopefully you have a projection system for your computer so all can see and collect the statistics from the screen and then have them use the info to do whiteboards and proceed as your plan suggests. But give them the "hands-on" component even though it is a single lab setup and only a couple of volunteers that come from the group actually touch the equipment.

(As a modeler, do you really expect anyone to support your suggestion #3?)

Date: Fri, 7 Jul 2000
From: Art Woodruff <woodruff_a@POPMAIL.FIRN.EDU>

I've found that unless the point of the presentation is to get teachers to sign up for a workshop, *giving them something they can actually use is best. I've done a whiteboarding workshop similar to what you have planned, and it has gone well.*

I did the first lab presentation myself, assigning one of the participants to be the teacher. I gave the teacher a set of index cards with questions/comments to make and gave some of the other participants "student" questions. I intentionally said some things that were wrong (but at the level of the teachers so they could correct me). After the lab presentation, the teachers prepared and presented whiteboards using some of the deployment worksheets. When I've had a mixed group of teachers, I made sure there were worksheets for each discipline that was represented.

The teachers got to participate in a reasonable facsimile of a lab presentation, and got to see the benefit of preparing and presenting using the whiteboards.

I would avoid having the teachers do the lab themselves unless they are familiar with the lab and the equipment - and if that's true, what's the point - and instead focus on what is different (student centered presentation and discussion) and what the teachers can do.

UPDATE in 2003:

Date: Tue, 18 Feb 2003
From: Patrick Daisley <patrick@daisley.net>

My best advice is to *not try and squeeze more than you can into a small time frame*. When I gave my presentation I had only 45 minutes, not nearly enough time to truly describe modeling. What tends to happen is it turns into a "white boarding" or "probe" presentation. I tried to have the participants go through the constant velocity lab, collecting data and preparing a whiteboard. My thought was that they could present the whiteboards and then I could give them a flavor of modeling as we tried to develop the model. Of course, there wasn't enough time. They collected the data, made the whiteboards and we just had time to start presenting. No questioning strategies, no model building. For a lot of them all modeling was, was using the whiteboards. I would get comments like: "those are nice, but you can do the same thing with poster paper".

I have given longer presentations lasting about *2 hours*. This gives me more time to START to describe models and modeling. *I usually set the stage for about 20-30 minutes, discussing the use of models over concepts, the modeling cycle, and my successes and challenges. I do still have them perform a simple lab, like the constant velocity lab or the ball on rail lab (if I have access to computers and photogates). I make sure that there is time enough to develop at least part of the model at the end.* This longer presentation has been generally well received and has interested some people into looking further on their own.