

COMPILATION: give the correct answer?" (part 2)

Date: Thu, 15 Nov 2001

From: Robert Bogenrief <RBogenrief@STLUCIE.K12.FL.US>

As a new modeling physics teacher, I have found two areas of difficulty that I would like help on. I have not found anything in the reading materials that help me sufficiently. First, my students have complained to the administration that I do not tell them what the right answer is. My supervising administrator wants me to make sure the students know the right answer at the end of a discussion. ...

Date: Sat, 17 Nov 2001

From: mitchell johnson <mitchjohnson@EARTHLINK.NET>

... As far as telling kids the answer, my position is: You do it once they will shut down and wait for you to do it again like Pavlov's dogs

Jamie Vesenka wrote:

<< I have found posting my own solutions to the work sheets (after they have been covered in class by the students), also appears to alleviate the apprehension amongst those students who do not feel they are getting the correct answers. >>

I will try the posting of work after we white board them, but I think I will not post answers to diffuse the Idea that the answer is everything.

Jamie wrote:

<< Choose your battles carefully. Stick to your guns when you can convince the students of the reasonableness of the demands. I believe resorting to conventional methods to address rebellious student behavior is not a weakness on our part, but rather an indication of the students' reluctance to think. >>

I got a warm fuzzy for me last year when my student said "only the smart kids like the way you teach." The ultimate back door compliment. But I believe that there is a level of intelligence necessary to enable a student to realize that it is for their own good. The rest may never appreciate it.

Date: Sun, 18 Nov 2001

From: Andrew Kartsounes <kartsoun@HARTLAND.K12.MI.US>

I have been following this thread with some interest because I never had any problem implementing modeling past a few easily handled parental questions. I have always chalked this up to the fact that nobody in my District knew what I was covering before, and they certainly don't now.

However, now I find myself wondering about this "never giving the right answer" thread. Does this mean that even after you have whiteboarded a worksheet, the students still don't know if the answer to #4 was 21N? Am I the only one who sometimes does examples to help students

use proper problem solving techniques? Maybe I am misinterpreting the emails. Can someone enlighten me?

Date: Sun, 18 Nov 2001
From: Sherry Brown <browns@ESKIMO.COM>

Andrew Kartsounes wrote:

<< I have been following this thread with some interest because I never had any problem implementing modeling past a few easily handled parental questions. >>

That's great. It's similar to where I am now. In fact, the parents are really supportive -- but there are always some parents of whom I am wary because I know what they can and will do. Given my 5 years here and the reputation the course has, I'm less likely to be in the hot seat. It doesn't hurt that I nearly had the principal fired this past spring (for good reasons), so I'm reasonably protected.

>Maybe I am misinterpreting the emails. Can someone enlighten me?

However, at the school where I no longer work (way more affluent), parents were absolutely dead set against constructivist teaching because their kids were not guaranteed an "A." In these days of inflated test scores and GPA's, any bump in the road to the Most Prestigious University is met with extreme resistance.

One of my colleagues was under siege from parents because she was using inquiry-based methods thus making the kids examine how they know what they know. In the conference she was told by the parent -- "you're paid to teach not to make him think!" She was continuing (similar to tenured), so they then turned their sights to chemistry (me, first year in that district).

Kids will complain "s/he's not teaching me!" because they are not sitting passively, taking notes and spitting back what the instructor said the day before. A lot of these kids got to where they are *because* they are good at rote learning.

Rote learning is comfortable -- it's easy enough to do and conserves energy. Less energy expended in the learning process means more energy for other pursuits.

Any deviation from that process is perceived as a threat by <some> students and parents -- a threat to the GPA, a threat to the college admissions process and in turn, a threat to maintaining their economic status.

So, maybe the issue isn't really about giving the "right answer" to a question -- or even a direct answer for that matter. Maybe it's that the Socratic dialog is perceived by some segment of the population as an educational obstruction that must be removed for survival of their species.

Date: Mon, 19 Nov 2001
From: Mary Lee Davis <mdavis_44@YAHOO.COM>

On the issue of "not giving kids the right answer", I hope we are concerned first for teaching the students and not the course. I happen to love the modeling program and have been teaching it since '92 in a upper middle class neighborhood with very protective parents. If the students do not feel "safe", they are psychologically unable to learn. This does not mean that they need to be given the right answer, but that they need to feel safe in not having it.

Date: Mon, 19 Nov 2001
From: Brenda Royce <BRRoyce@attbi.com>

This 'right answer' discussion seems to have caught a lot of attention, for me as well. I am in my 4th year of modeling, and have not had the really difficult student/parent trials some have described. Probably due as much to the luck of my circumstances as anything. One way I've dealt with insistent requests for the right answer is to answer with a series of questions (of course!): Did you identify an appropriate model? Did you use it correctly (math model, graph...)? Are your calculations correct? Then your answer must be correct (assuming I am confident in their process as well). I can both validate their results while placing the responsibility for the thinking in their laps by making them evaluate their process first.

In my experience, no one method or technique can be adhered to doggedly without being sensitive to the students. If students are so anxious they can't function without an 'answer' they may not be ready to think independently without some help. I would be concerned if modeling is used as a sink or swim proposition without also being willing to take kids through the process of learning to have confidence in their ability. Some just do not shift their previous patterns easily.

I see my job as getting as many as far up the ladder as I can and not just to implement a particular methodology (though I am absolutely sold on what I've learned through modeling -- and what my students learn now and implement it as fully as my ability allows). Some areas I've found I have to address to get kids to have confidence in what they are doing (including their answers) are:

1. teaching them to distinguish their observations from their expectations (usually colored by underlying misconceptions),
2. learning to connect the current situation back to the lab/ demo/ experience that established the model and helping them articulate the connection (and unfortunately, reinforcing their algebra/math skills!).

In other words, teaching kids to think in terms of scientific experience. Just withholding right answers won't necessarily do that. I've found it helpful to promise them up front (and repeatedly) that they will have to think hard and in ways they may not have been expected to think before, but that I will also do everything I can to help them succeed in learning how to do that — and figuring that last part out just may be THE challenge of teaching.

Date: Sat, 15 Dec 2001
From: Jason B Lonon <j_lonon@LYCOS.COM>
Subject: defining "the right answer"

Throughout the entire thread, I've not seen anyone actually define what they mean by giving the 'right' answer.

We, as instructors, have an operational definition of the 'right' answer in our head. Even this definition varies from instructor to instructor. However, very rarely do we take the time to teach our students what our own definition of correct is. To my students, it turns out that their initial screams for the 'correct' answer were present because they did not understand that I was not interested in and would not be grading them on whether their numerical response matched a pre-determined set response. That's how it had been done in every other class they had taken, and they saw no reason for it to be different here. I've found that students in my class have to be 'taught' what I expect, because it is so different than other classes.

Anyway, just thought I would put that out there - most students come into my class with the idea that the 'right' answer is a pre-determined value that they must 'find', whereas to me it is making a decision as to whether the appropriate process has been followed and checked against classroom knowledge.

Date: Tue, 18 Dec 2001
From: Lou Turner <louturn67@AOL.COM>
Subject: Research supports modeling approach

An article starting on page C13 in the December 18 issue of the Boston Globe provides strong support for the Modeling Method style of class management. The article describes research at Tufts University on the Eureka Moment. Researchers found that the subjects were much more likely to remember information delivered in the form of aha sentences where the subjects experienced a period of confusion before suddenly being given a key. The work reinforces the importance of letting people struggle with concepts a little bit first. The researchers say that confusion is an essential component for a strong memory, and that educators should strive to design lessons that will give students aha moments.

Harvard's Dorothy Leonard said that, in designing new educational programs for executives, the pressure is to provide answers, to provide frameworks, and to provide lists. But, if the Tufts research is correct, they will not remember them as long if you don't design in time to be confused and struggling.

In the paradigm experiments, modeling students are confused and struggle to learn what their data is telling them. This research perhaps explains why modeling students have long-term retention of what they learn from the experiments. My experience is that AP students taking the FCI at the beginning of their senior year get almost exactly the same score they had at the end of their sophomore year in introductory physics.
