

Moving Beyond “Rote Learning”

Comments on teaching with activities - teaching in courses like 0332, 0385, 0455, and 0365.

Mary Parker, Aug. 20, 2014 (www.austincc.edu/mparker/talks/2014-aug21-acc/)

The questions:

1. What is it we want to be different in this course than the “standard” courses?
2. Why are we doing group activities?
3. What balance do we want between making the students “comfortable” and “making students think”? (Are those incompatible in the minds of students?)
4. How do we inspire students to be willing to be somewhat uncomfortable?
5. How do we give students enough rewards (grades, praise, etc.) to encourage them to grapple with challenging problems?
6. Why is math required for all students?

My answers:

1. What is it we want to be different in this course than the “standard” courses?
My answer: I think a major goal is for students to be able to use the math they know in a flexible manner to solve problems in some context. So I want to look at each thing we’re doing in the course and ask whether it is promoting students’ deep-enough understanding to use the material flexibly. (That is – read and respond appropriately to the instructions, even when they are not exactly like the instructions were for a previous problem, to try to make sense of the question and then the answer in the context of the problem, and things like that.)
2. Why are we doing group activities?
My answer: In my experience, if I can get students talking about the material, and then get them to write something down – often the talking is considerably more insightful and useful than what they write down. I haven’t fully understood why this is true, but I have seen it pretty often. If they are working in groups, and they talk to each other, then they spend time on the “talking and making sense” portion of thought, and don’t jump as quickly to “just write down something with the right numbers and go on.” (See more – question 6 here.)

And both the talking and the thinking are a lot richer for a problem in a realistic context than an abstract problem. We math teachers are inspired by abstraction (I know I am) but I recognize that almost all my developmental students find it more interesting to generalize from real-life contextual problems.

3. What balance do we want between making the students “comfortable” and “making students think”? (Are those incompatible in the minds of students?)
My answer: Yes, I think that much too often those are incompatible in their minds. And our goal is to make them do the more uncomfortable one! Most of the time! No wonder this is challenging!

4. How do we inspire students to be willing to be somewhat uncomfortable?

My answer: I think it is very useful to have them read “How to Grow Your Intelligence” and do some activity based on it. <http://www.edweek.org/media/youcangrowyourintelligence.pdf> Here’s a slide show and video which address the same thing:

<http://prezi.com/mgajqkyb18cj/malleable-intelligence/> || <http://youtu.be/WtKJrB5rOKs>

And then follow that up with consistently using language that praises working hard and noticing and then using good strategies and NOT praising them for being talented or smart. See strategies for getting students thinking about this in the last two pages of this:

http://teachingasleadership.org/sites/default/files/How_To/INV/I-1/I-1_Teach_Malleable_Intelligence.pdf

Look for other ideas and resources by searching on Malleable Intelligence.

5. How do we give students enough rewards (grades, praise, etc.) to encourage them to grapple with challenging problems?

My answer: I’m still working on this and am not even nearly satisfied with myself on it.

I know that the praise has to be careful language – mostly careful about only praising for hard work and effort. (I find reading about Montessori teaching and teaching “Godly Play” to be useful here. Both emphasize using language to help students approach learning from inner motivation to learn rather than from external motivation (to please someone or get good grades.))

My main strategy so far – have substantial amounts of homework grade for effort, but make it for effort with good strategies, like correcting problems that were worked incorrectly at first, writing down questions (in words) and later writing down the answer found. But by the time of the test, they need to get problems done correctly with some partial credit for good insights and strategies.

6. Why is math required for all students?

My answer: Part of the reason is “quantitative literacy.” Another important part is that students learn to do careful, exact work when that is needed. Consider these ideas:

“Reading maketh a full man; conference a ready man; and writing an exact man.” – from the essay *Of Studies* by Francis Bacon.

“Written speech is more difficult than oral speech to the same degree that algebra is more difficult than arithmetic.” – from *Collected Works of L. S. Vygotsky*, Volume 1, page 203.

A Google search on “Vygotsky writing algebra” will give you a link to the Google book, page 203 as the third link (at 10:30 on Aug. 19, 2014.) (If you read from this, you’ll also see Vygotsky’s ideas of why collaboration is such a vital part of students’ extending their consciousness of what they know.)

Vygotsky was a Russian contemporary of Piaget, whose writings weren’t translated into English until the 1960’s. A phrase associated with V’s ideas is “zone of proximal development” where Piaget’s is “stages of development.” So the “scaffolding” that we talk about in designing activities is very much in tune with Vygotsky’s thought.