

Excerpts from a Teacher Debate on the Value of Math Reform: Why Cling to Traditional Teaching with Lectures, Worksheets, Drill and Tests?

1. What do you mean by "student-centered" teaching?

Students create and construct their own knowledge through activities, collaborative groups, technology, research, and projects. Classroom instruction is interactive with students talking more than teachers. Teachers facilitate instead of pontificate. The teacher serves as "guide on the side" rather than "sage on the stage." Teachers coach and encourage students by asking questions that lead to understanding. Students play an active part in the learning process by asking questions, discussing among themselves, and solving complex problems.

Assessment is designed to enhance understanding. Testing of student progress is often accomplished by a variety of methods such as essay questions, rubrics, projects, peer groups, and observations rather than single answer written tests. Students receive frequent feedback on their progress.

Student Centered Teaching:

1. Allows students to choose their own learning style.
2. They are allowed to work in groups.
3. The students solve real-life problems
4. The students get excited about expressing how they can solve the problems in different ways.
5. The students seem to continue learning after class because what they learn, they can use.
6. Students seem more motivated.
7. All levels of students learning abilities are accommodated.
8. Teachers are more sure what the students are learning. ...Janet Lopez

2. The old way works better...

Most students can learn best by lecture, worksheets, drill and practice.

Lectures leave a lot of children out. Some students may not understand lectures and worksheets. Worksheets do not show how or why a problem was worded a certain way. Children have different learning styles; teachers need different approaches. Some students need hands on learning to understand concepts.

I learned it the old way.

You were successful because you were one of the 10% of students who learned best the old way, so you are here learning to teach. The other 90% of students who could not learn the old way are not here. Many dropped out of classes or school because they could not learn that way. Do you want to lose 90% of your students? Often it is the most creative and intelligent students, who do not want to memorize and follow someone else's rules, that drop or fail. These talented students are convinced that they are not capable of learning, when in reality, when their learning styles are accommodated, they often turn out to be the best students.

Those successful students, who were forced to give up their own ideas and play the school game, have a hard time unlearning rules so they can begin to understand the concepts to use in real life applications.

You made it through classes, perhaps with good grades, but can you really understand what you learned? If you had learned it the new way, you might be able to better understand and use it now.

This way has been used for 500 years, why change now?

This way has been tried for 500 years, and has never worked except for a few students. Since it does not work, what do we have to lose by trying another way? More drill and practice on useless stuff will not help students learn how to apply knowledge to real life applications, the skills needed in today's world.

Times and technology has changed in the past 50 years. Computers and calculators can do the basic operations, people are needed to decide what to put in, what buttons to push, and whether the output is reasonable. No one will pay a person \$30,000 per year to do the job of a \$20 calculator, so learning to be a calculator is useless.

Understanding will automatically follow memorization.

Understanding does not automatically follow memorization. I can memorize the words to a German song without understanding German.

3. It is easier to teach the old way...

It is easier to teach the old way.

It may be easier for you right now because that is the way you learned, but it is less effective. After you have mastered the new way of teaching, you may find it is easier. The new way helps the teacher to better understand the lesson. Also by learning a new way to teach, the teacher models for students how to learn something new.

Testing knowledge is easier than testing higher order thinking skills.

Like anything else, alternative assessment becomes easier with practice. It is more interesting because it shows how differently people approach the same problem, often with astonishingly creative results. Most of the new elementary school textbooks include alternative assessment methods.

I don't want to add more work to my teaching load.

Anything new will be more work for a while, but in time you will discover ways to make it easier. The time spent gathering information and writing lectures can be spent assessing student work and giving feedback instead.

I am too old to learn a new way.

Many older teachers have found trying new ways of teaching invigorating and rewarding. They have renewed their enthusiasm and enjoy working more closely with students.

4. It is risky to try something new...

I feel uncomfortable doing something new.

This is what we ask of students every day; cannot we also ask it of ourselves? Having a teacher be a role model for life-long learning is good for students. We can model for them how to react positively to mistakes, how to approach new problems, how to cope with confusion, how to react when someone doubts your intelligence or is disrespectful. These are important lessons for students to help them develop confidence and assertiveness. If you do not understand how to do things the new way, you can model what to do when you don't know what to do, where to go for help, and how to persevere until you succeed. You can model honesty when you don't know the answer and you can reinforce their self esteem when they help you discover something new.

My colleagues will laugh at me for doing activities when everyone else lectures.

You will have the last laugh because your students will understand the material and be able to use it. Retention and student success will increase without sacrificing quality of learning. Associate with more understanding colleagues whenever possible. There are always those who will criticize you no matter what you do. Better that they criticize you for something you are doing well.

Many remedial students are kinetic learners. Hands-on activities are the best way for them to learn. You are wise to have chosen to help all your students to learn, not just the best memorizers.

The students will think I don't know the subject unless I present eloquent lectures.

Lectures are the most common and least effective method of teaching. Lectures are also the method the students like the least. The attention span for an adult listening to a lecture is about 10 minutes; it is less for children. Showing them how well you can do the problems may help you learn the subject better but not the students. Instead the students either feel helpless and intimidated, or bored and superior. Either way, they are not learning much. They will respect you and like you more if you empower them and let them do the talking.

There may be more discipline problems.

There are many ways to maintain control and avoid discipline problems when students work in groups. Working in groups is a skill that can be learned by both teachers and students. When students are engaged in active learning, they are often too busy learning to get in trouble. On the other hand, as one student says, "The old way is very boring. All you do is listen. Students will be easily side-tracked, start doodling or even talking. "Student-centered learning gains the students undivided attention. Hands-on tactics get and give more attention. The students get more involved." Research shows that the best indicator for learning is time on task. Students are on task when they are working on problems, not when they are listening to a lecture.

I am evaluated as a teacher on how well I lecture.

Many administrators are aware of the new teaching paradigms. For those who are not, they seldom visit your classroom, and you can arrange a lecture for the days that they visit, if necessary. Then you can gradually educate them by sending them research-based information about student-centered learning and involving them in inservice activities.

You cannot teach well without coaching. Students need to engage their emotions as well as their intellects for maximum learning.

Some students may know more about the topic than I do.

This is a wonderful opportunity to let students feel good about their expertise. You don't even have to let them know you don't know. Just pretend you don't know and have them explain it to you until you understand it. If they can't explain it then they probably don't really understand it either, and you can try to figure it out together, or catch up on it after class.

5. The students learn more the old way...

We must cover a lot of material quickly in order to finish the curriculum in time.

It is said that the American curriculum is a mile wide and an inch deep. Instead of learning any concept well, American teachers teach the same shallow stuff again and again each year, with little understanding or remembering by the students. In contrast, many countries whose children do better on International tests, teach fewer subjects, more in-depth, so that the children truly understand and remember the concepts.

You can talk about more material faster by lecturing, but the students will learn less than if they experience the concepts. Talking is not teaching.

The new way is "dumbed down".

On the contrary, the new way allows time to explore topics in-depth and technology allows students to explore more complex concepts than in traditional classes. Real life problems can be applied later in life and thus are more useful to students. Many of the tricks employed in traditional classes are obsolete and unnecessarily in a technological world.

Hands-on activities teach silly stuff that is not in the syllabus and does not relate to the subject. Unfortunately some teachers have interpreted hands-on activities to be games unrelated to the subject. All activities should further the purpose of instructing the students in the subject matter.

Students won't understand unless I explain it first.

How many people do you know who have read the instructions to their VCR's?

Students do not have the motivation and self-discipline to plan and research on their own.

When given the opportunity, motivation, and audience for challenging projects, students have produced incredibly creative and thoughtful projects. The projects that motivate best are those that students find interesting and relevant to their lives. For this reason, letting students choose their own areas of research usually results in better projects. Clearly defining the parameters, timelines and providing rubrics for the project outcomes when the project commences, keeps students on-target and engaged.

Students who are absent will find it difficult to make up work

Meaningful tasks and sharing ideas with other students can make it easier for a student who is absent to catch up with the work s/he missed. Teachers can assess the progress of students who have missed class by assigning makeup work that requires concept mastery. If a student proves to be missing concepts due to absence, the teacher can schedule a review session to go over the work missed.

6. The students prefer the old way...

The students want me to tell them what to do.

The students have been conditioned to believe that their precious grades depend on the whim of a teacher, so that memorizing instructions directly from a teacher will insure success. Assessment drives learning. People like to do what they are rewarded for. Alternative assessment such as observations and rubrics that require critical thinking in ambiguous, real-life applications must be used instead of tests of rote memorization and mechanical manipulation exercises. Frequent feedback to students on their progress, and rewards for creative ideas will encourage and reassure anxious grade-seekers.

Students don't like to think.

By culturally defining confusion as a symptom of failure instead of a symptom of learning, we condemn ourselves to the risk-free, but unproductive memorization of pieces of information labeled as facts. Without the intellectual curiosity to examine the sources of our information, we cannot even distinguish between facts and opinions. Dutifully we take in and regurgitate the bits of information we are served so we can ultimately take home a piece of paper that proves we have passed the tests. The naive curiosity and excitement of learning has been purged from all but our most resistant students after the first few grades of primary school. People love to be challenged and learn when they believe they can. Why else would people spend hours playing video games for entertainment? If we give students challenging but solvable problems and reward them, they will enjoy learning.

7. I care about students...

I prepare my lecture carefully

You are very dedicated and hardworking. However, since students only retain 10% of what they are told in lectures and videos, wouldn't you be more effective if you check your impulse to "show and tell" and instead "facilitate and coach" the students? Getting A's and B's is not a measure of understanding but a measure of compliance. You can choose to demand they pay attention to your lectures or that they actively participate in learning experiences.

I am preparing my students for their next classes.

What if their next classes are not traditional lectures, but follow a more modern paradigm of student-centered with interactive learning? It is easier to go from student-centered to lecture style classes because in lecture classes all the students need to know how to do is to take notes and memorize.

8. I do not know how to teach any other way...

I was trained to teach the old way.

Training is readily available in the form of workshops, inservice, Internet Web Pages, etc. Scores of complete lesson plans can be found on the Web.

Additional comments:

Active learning shows the children the teacher is excited about the subject too. The teacher knows if the students are grasping the concepts. It helps students' communications skills.

In a student-centered classroom students learn to work with other people to solve complex problems.

Active learning covers more of the bases: more learning styles, more hands-on material, exciting for children.

Traditional educational methods fostered obedience to prepare for the work place: sitting quietly in straight rows, a factory model, memorizing and following rules. Our traditional classrooms were modeled after New York garment factories.

Traditional education tortures students by making them learn useless, boring, difficult, repetitive (demeaning) tasks. Dentists torture you too but at least they fill your teeth.

Are we like the drunk who lost a quarter in the gutter, but searched for it a block away under a street lamp because there was more light there? Are we just doing things the way they have always been done because it is easy, and not because it maximizes learning?

Skills taught in context are understood and learned better than skills taught separately in a certain sequence.

Actual justifications given by math teachers for teaching math they acknowledge is useless and students do not understand:

“If it is easy to understand it is not math.”

“Math is a common cultural experience of hell that people share. It has to be difficult and incomprehensible in order to make people miserable.”

The traditional classroom is a stage where teachers can demonstrate their intellectual superiority to students. Students are the admiring audience who aspire to attain a higher intellectual position in society. The more incomprehensible the material, the better it serves the goal.

Traditional teachers need to rationalize why they spend their lives on something so worthless. Like those who follow post-hypnotic suggestions, like "Kiss the dog," they need to justify their actions by claiming they are doing it for a logical reason.

We need to distinguish meaning from mechanics of math. Meaningful activities depart from standard manipulation exercises often found in traditional textbooks.