

## Educational Practices that Work: Information from Research on Teaching

PA Department of Education Annual  
Conference  
Hershey, PA March 2, 2012  
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## Educational Practices that Work for . . . ?

### Need to specify a learning goal

- Deep learning that integrates skills and conceptual understandings

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## Begin With a Sobering Fact

Teaching in a typical classroom in the U.S. hasn't changed much in the past 100 years.

- Teachers interact with students about the content in much the same ways
- Changes at the margins, but not at the core of teaching

This is despite continuing efforts to reform

- Why haven't these efforts worked?

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### Why No Change in Teaching?

#### Teaching is a cultural activity

- The methods we use to teach are spread throughout the culture and handed down from one generation to the next
- Much of what we do in the classroom is so common it becomes invisible

#### Learning to teach is a cultural activity

- We sit in classrooms for 16 years as students
- We attend workshops and conferences

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### Stepping Outside of Our Own Culture

#### Looking inside other cultures can be useful

- Not to copy, but to see ourselves more clearly
- And to imagine new ways of doing things

#### Let's begin by looking at teaching in other cultures

- Keep in mind the learning goal: Deep learning that integrates skills and conceptual understandings

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### Comparing Teaching Across 7 Countries

TIMSS 1999 Video Study examined about 100 8<sup>th</sup>-grade math lessons in each of 6 higher achieving countries and the U.S. (Australia, Czech Republic, Hong Kong, Japan, Netherlands, Switzerland)

Videotapes of a random sample of lessons gathered across the year in each country

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### Types of Problems Presented to Students

Stating Facts: recalling or applying definitions or conventions

Using Procedures: applying learned procedures

Making Connections: constructing relationships among ideas, facts, or procedures

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### Examples: Making Connections

Solve these two equations and describe what is different about their solutions

$$2x + 4 = x + 6 \quad 2x + 10 = 2(x + 5)$$

Find a pattern for the sum of the interior angles of a polygon




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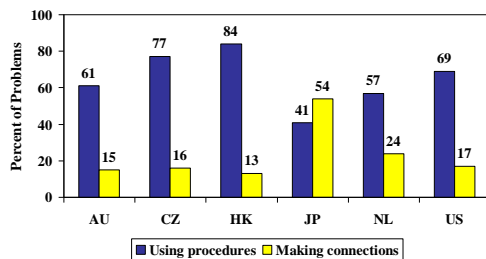
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### Types of Problems Presented




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## Types of Problems Presented AND Worked On During the Lesson

Each problem was coded a second time based on how it was worked on and discussed during the lesson.

This is where teaching really matters.

- Problems can be transformed

## Example: Transforming a Problem From Making Connections $\Rightarrow$ Using Procedures

Problem: Find a pattern for the sum of the interior angles of a polygon

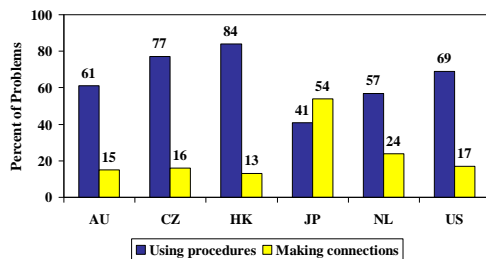
Worked on as Making Connections

- Measure the sum of the angles for 3-, 4-, and 5-sided polygons; predict for 6-sided polygons; for n-sided polygons; develop a general formula

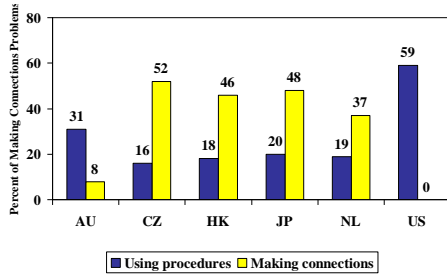
Worked on as Using Procedures

- Present formula [Sum =  $180(n - 2)$ ] and ask students to practice

## Again: Types of Problems Presented



### How Making Connections Problems Are Worked On During the Lesson



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### Lessons Learned from these Comparisons

#### Teaching trumps the curriculum

Each higher-achieving country had a different way of teaching but they all created learning opportunities for students that enable integrating skills and understandings.

- Different surface features
  - Different percentages of problems of each type
  - Different ways of structuring the lessons
- Similar deep-level features
  - Problems allowed students to integrate skills and concepts
  - Students encouraged to struggle to solve these problems

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### How Can We Change Teaching?

Remember, learning to teach is a cultural activity. We have been using the same professional development methods for years.

Comparisons with learning opportunities for teachers in other countries, and research on teacher learning in the U.S., suggest that we need to change the learning opportunities for teachers.

- Focus professional development **directly** on studying and improving teaching
- Treat teacher learning as a by-product of working to improve teaching

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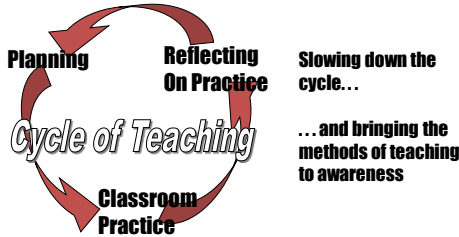
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### How Do We Study Teaching? Slow It Down




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### What Does It Mean to Slow Teaching Down?

#### Change our assumptions about teaching

- Teaching is something that can be studied and learned; it is not an innate talent
- Learning teaching requires working together, making teaching a public rather than a private skill owned by individuals
- Good teaching means careful planning and critical reflection, not just good performance
- Schools must become places where teachers, not just students, learn.

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### Guideline 1: On-Site Collaborative Work

Teachers organize themselves into workgroups of 3-6 members

- All members of a workgroup must share the same specific learning goals for students

Teachers meet weekly for 60-90 minutes to study more effective ways for helping students achieve these goals

Weekly meetings must . . .

- Begin and end on time; no one can be tardy or absent
- Follow an agenda developed beforehand with clear goals to accomplish during that meeting (allow only 10 minutes for complaints and stories)
- Select a small segment of teaching to study (e.g., one lesson)
- Keep "homework" to a minimum

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### Guideline 2: On-Site Leadership

Productive collaborative work requires leaders who

- Organize the group for work
  - Keep the focus on studying teaching
- Persist in the face of only incremental changes
  - The changes that matter are changes in teaching (even small ones) that make a difference in students' learning (even small ones)
- Feed the group with new ideas
- Hand leadership to others when appropriate

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### Guideline 3: Details of the Work

Begin by designing a few lessons with great care  
 Specify the learning goals clearly and precisely  
 Include some instructional activities that require attending simultaneously to skills and concepts  
 Predict students' responses to these activities in order to decide beforehand how to respond  
 Gather evidence on lesson's effectiveness and improve the lesson each time it is taught
 

- Collect and study students' work
- Assess whether the lesson helped students achieve the learning goal(s)

 Accumulate the improved lessons and share with other teachers who have the same learning goals

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### Won't This Approach Take Years?

Yes

The approaches tried for the past 100 years do not show great promise

Maybe it's time to engage the thousands of teachers in the actual work of improving teaching

- They are the only ones who can improve teaching
- It is time to create the learning opportunities that enable them to do so

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## A Better Way

Contributing to changes that matter means  
planting shade trees under which we know we  
will not sit. D.  
Elton Trueblood

“When you improve a little each day, eventually big  
things occur . . . . Not tomorrow, not the next  
day, but eventually a big gain is made. Don’t  
look for the big, quick improvement. Seek the  
small improvement one day at a time. That’s the  
only way it happens—and when it happens, it  
lasts.”

John Wooden  
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