Differentiation & the Brain
A Quick Look at Shared Principles

Solution Tree authorspeak 2011
Indianapolis, IN
November 1, 2011

David A. Sousa
<davidsnj@aol.com>
Carol Ann Tomlinson
<cat3y@virginia.edu>

Differentiation is
a sequence of common sense decisions
made by teachers
with a student-first orientation

Adam Hoppe, 2010

The Common Sense of Differentiation

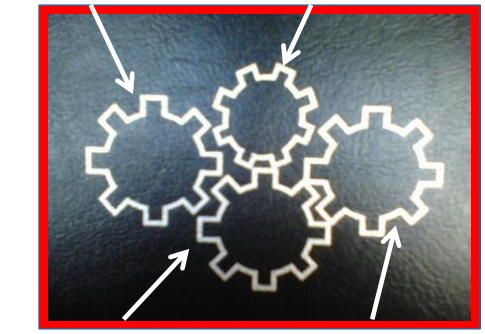
Ensuring an environment that actively supports students in the work of learning

Absolute clarity about a powerful learning destination

Persistently knowing where students are in relation to the destination all along the way

Adjusting teaching to make sure each student arrives at the destination (and, when possible, moves beyond it)

Effective management of flexible classroom routines



1 Quality DI

Begins with a growth mindset, moves to student-teacher connections, & evolves to community.

Paving the Way

MINDSET ➡ CONNECTIONS ➡ COMMUNITY

to Learning

The Predictive Power of Mindset

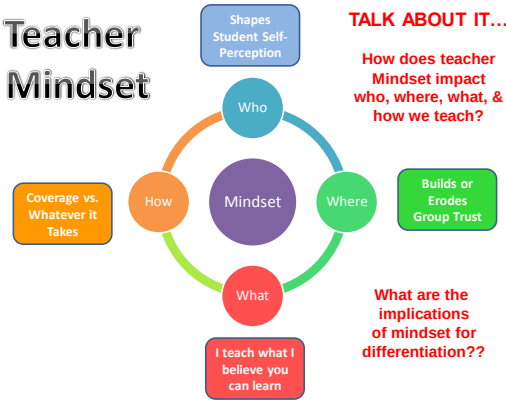
Fixed

- Success comes from being smart
- Genetics, environment determine what we can do
- Some kids are smart—some aren't
- Teachers can't override students' profiles

Growth

- Success comes from effort
- With hard work, most students can do most things
- Teachers can override students' profiles
- A key role of the teacher is to set high goals, provide high support, ensure student focus—to find the thing that makes school work for a student

Teacher Mindset



TALK ABOUT IT…

How does teacher Mindset impact who, where, what, & how we teach?

What are the implications of mindset for differentiation??

Paving the Way

MINDSET ➡ CONNECTIONS ➡ COMMUNITY

to Learning

Teachers discover that they need to develop and maintain personal relationships with the students they teach — because for most students, meaningful interaction with a teacher is a precursor to academic learning.

Huberman, 1983 in
The New Meaning of Educational Change
(3rd Edition) by Michael Fullan
2001, New York: The Teachers College Press, p. 33

A Simple Idea for Connecting with Kids

Name_____ Date_____ Pd._____

Best Thing about the Week _____

Lord of the Flies Anticipation Guide

Warm-up Activity: Read the statements below and write an "A" next to any with which you agree, a "D" by any with which you disagree, and "NS" if you're not sure how you feel. Explain BRIEFLY why you feel as you do.

1. _____ Children are capable of horrific behavior.

_____

Explain:

_____

2.

Some alternatives: Action State (wishing I were skateboarding); How you're feeling about the novel; favorite movie; do you like hot dogs; worried about; etc.

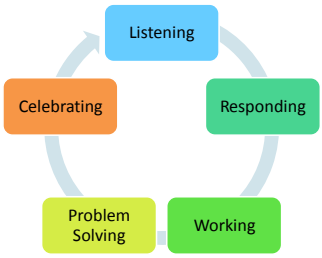
Mark Myles

Paving the Way

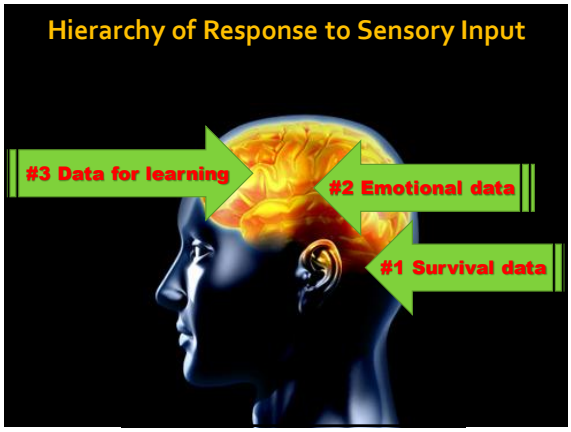
MINDSET ➡ CONNECTIONS ➡ COMMUNITY

to Learning

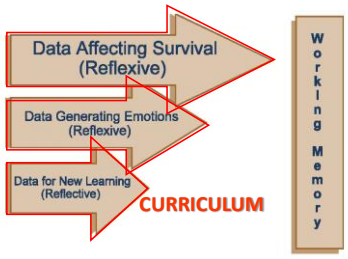
How Community Evolves over Time



Hierarchy of Response to Sensory Input



Hierarchy of Response to Sensory Input (Text p. 21)



2 Quality DI

Is rooted in meaningful curriculum.

QUALITY CURRICULUM:
THE SHORT VERSION

Engagement + Understanding (sense & meaning) = Success

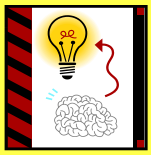
To Ensure Engagement

However we conceive it, every lesson plan should be, at its plan at its heart, motivational plan. Young learners are motivated and engaged by a variety of conditions. Among those are:

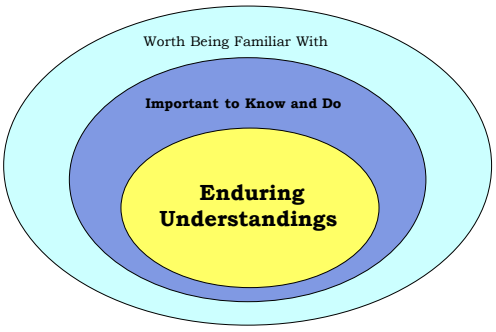
- novelty
- cultural significance
- personal relevance or passion
- emotional connection
- product focus
- choice
- the potential to make a contribution or link with something greater than self

Tomlinson • 2003 • Fulfilling The Promise…

To Ensure Understanding…



Teachers Must Distinguish Between:



Planning a Focused Curriculum Means –At the Very Least—Clarity About What Students Should …

- UNDERSTAND
  - Principles/ generalizations
  - Big ideas of the discipline

KNOW
- Facts
- Vocabulary
- Definitions

- BE ABLE TO DO
  - Processes
  - Skills

KNOW

Facts, names, dates, places, information

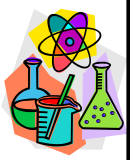
- There are 50 states in the US
- Thomas Jefferson
- 1492
- The Continental Divide
- The multiplication tables
- Procedural information (how to…)

BE ABLE TO DO

Skills (basic skills, skills of the discipline, skills of independence, social skills, skills of production)

Verbs or phrases (not the whole activity)

- Analyze
- Solve a problem to find perimeter
- Write a well supported argument
- Evaluate work according to specific criteria
- Contribute to the success of a group or team
- Use graphics to represent data appropriately



UNDERSTAND

Essential truths that give meaning to the topic
Stated as a full sentence
Begin with, "I want students to understand THAT…"
(not HOW… or WHY… or WHAT)

- Multiplication is another way to do addition.
- People migrate to meet basic needs.
- All cultures contain the same elements.
- Entropy and enthalpy are competing forces in the natural world.
- Voice reflects the author.

FOCUS HERE!!!

KUDs Matter Because:

They establish clear learning goals
- Allow us to align goals, assessments, teaching, and learning tasks

They allow us to incorporate standards AND make meaning for students

They give us a basis for differentiation.
- Who needs which K's & D's
- How do we ensure that every student gets meaningful access to the U's
- They tell us what strugglers should invest in
- They give us a platform for extending for advanced students

A NON-NEGOTIABLE OF DI

Our goal should always be to create the richest, highest quality curriculum we know how to create…

Then, differentiate to enable the largest possible number of students to succeed with it.

Differentiation should always be about lifting up---never about watering down!!

TEACHING UP!!

Defensible Differentiation:

Always	•Teaches Up
Never	•Waters down

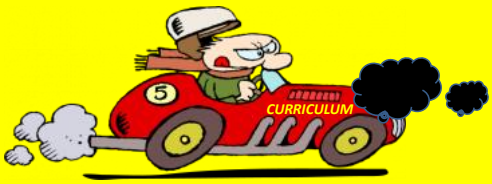
What Does it Mean to Teach Up?

TASKS:

Clear KUDs
Require careful thought
Focus on understanding
Problems to solve/Issues to address
Use key knowledge & skills to explore, or extend understandings
Authentic
Require support, explanation, application, evaluation, transfer
Criteria at or above "meets expectations"
Require metacognition, reflection, planning, evaluation

Curriculum Races Are Not Brain-Friendly

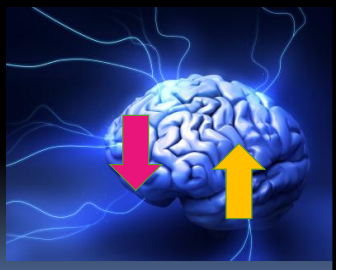
I've got stuff to cover!!



How much information is enough?

Too much information can hinder cognitive processing

Emotions take over



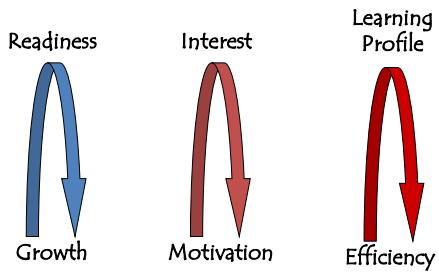
Build Neural Networks

- Less is More
- Shorter is Better
- Keep it Relevant

3 Quality DI

Results in a teacher planning based on student readiness, interest, & learning profile.

What's the Point?



Teachers at Work:

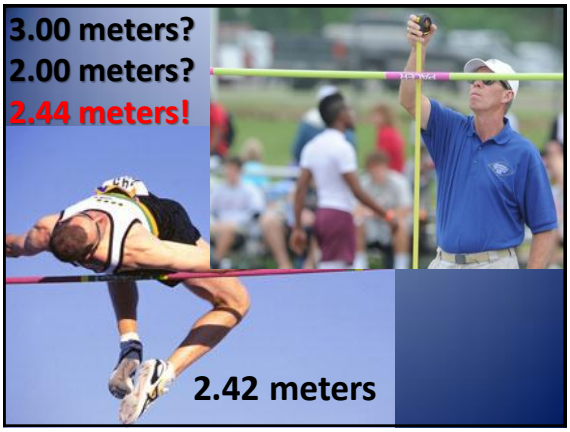
Responding to Student Readiness Needs

Math Ticket

Graphics	Problem of the Day	Computer
Tangram Ex (p.14#1) Tangram Ex (p.11,#9) Geoboard Pentagon Geoboard Hexagon	Complete the odd # problems from the POD board.	Complete the blue task cards
Math Writing	**Math with Legs**	**Teacher Feature**
•Explain in clear step by step way how you: *Solved your problem of the day or solved your Tangram/Geoboard challenge *Use pictures and words to teach someone how to do one of your five math tasks	Develop a real problem someone might have which graphing might help them. Explain and model how it the problem & solution would work.	When you are called

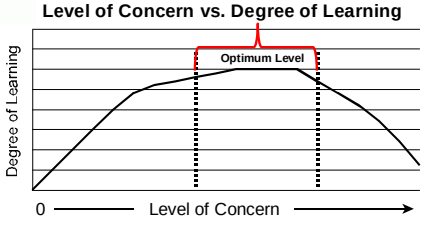
Mini Workshop

1. As students work on an assignment, systematically go around the room and spot-check their work—looking for patterns in misunderstanding or gaps in knowledge or skill.
2. Make a quick note of issues you see and students who are having those issues.
3. If you see a problem that's recurring as many as four or five times, call for a mini-workshop.
4. Ask students to stop working and give you their attention.
5. Tell them that as you've been observing their work, you see one problem that a number of students are having—and describe the problem/issue.
6. Tell students they'll be able to succeed with their work more readily if you can help them with the problem.
7. Ask them to come to a place in the room that you designate and to sit with you on the floor for a minute to clear up the problem.
8. Feel free to issue invitations to some students if needed.
9. Hold the discussion—generally for about 3 minutes.
10. Remind students going and coming to shift their positions so that others are not interrupted in their work.



Concern Over Task Difficulty

Brain Thrives on Moderate Challenge



What's worthwhile

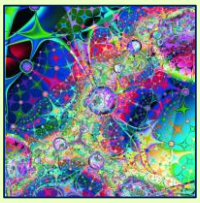
is rarely easy…

And the cost is

too great if

any of us give up!

It's nice to believe that the world is simple and we can easily get high quality answers to our questions. We often oversimplify by creating add-water-and-stir solutions. The truth is that our reality is very complex and we don't understand it well.



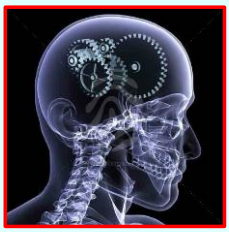
We need to spend more time helping people understand and deal with complexity and less time concocting dumbing-down mechanisms.

From *Harvard Business Review*. Cited in *USAirways Magazine*, Sept., 2011, p. 13.

- **Start slowly.**
- **Lead your students—make them your partners.**
- **Plan the details carefully and at a pace that works for you.**
- **Rehearse and review.**
- **Be reflective--celebrate successes and learn from rough spots.**

Remember what you want to accomplish & why it matters!

Keep Growing Your Brain



To Teach Brains