The Art & Science of Teaching

A Common Language for Instruction

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Only in Education....
Test questions and the answers students provided....

I didn't fail the test, I just found 100 ways to do it wrong.

—BENJAMIN FRANKLIN, politician, author, and inventor

The solid figure can best be described as:

Change 7/8 to a decimal.

Expand 2(x + y)

Upon ascending the throne the first thing Queen Elizabeth II did was to . . .

Sit down

Why was the Berlin Wall built?

Germany was competing with China.

What were the circumstances of Julius Caesar's death?

Suspicious ones
Correct the error in the sentence:
The girl were extremely intelligent.

The boy were extremely intelligent.

What scale do seismologists use to measure the force of earthquakes?

A very strong one (not glass).

Adam cuts his arm. Blood gushes out and is red in color. What does this show?

He is not a robot, he's a real boy!

The reality of our business…

- There is rarely, if ever, a perfect day of teaching.

2 minute discussions

Do you agree or disagree?

What's the role of talent?

Effective teachers are made, not born.

What's the role of deliberate practice?

Do you agree or disagree?

Most people are satisfied with competence, and never strive for expertise.

The road to success is always under construction.

—Lily Tomlin, actress

To change centimeters to meters you _________.

take out centi.
Happiness and Motivation

- Mastery
  - Get involved in something complex, and get good at it

- Purpose
  - Have an effect on people in a positive way

- Autonomy
  - Have some autonomy over your work

In Learning Organizations...

Everybody Should Be Learning...

School and District Leadership not only matters, but also has a direct correlation and measurable effect on student achievement!

Where should a school begin?

- Develop a common language of teaching
- Provide opportunities for focused feedback and practice
- Provide opportunities for observing and discussing effective teaching
- Require individual teacher growth and development plans on a yearly basis

“What Matters Very Much is Which Classroom?”

“If a student is in one of the most effective classrooms, he/she will learn in 6 months what those in an average classroom will take a year to learn. And if a student is in one of the least effective classrooms in that school, the same amount of learning takes 2 years.”

Deborah Loewenberg Ball, Dean of Education, University of Michigan

Principal Behaviors and Student Achievement

- Principal Actions
- Teacher Actions
- Student Achievement

Important Research

Advanced ED

Four Domains for a Common Language of Teaching

- Domain 1: Classroom strategies & behaviors
- Domain 2: Planning & preparation
- Domain 3: Refocusing on teaching
- Domain 4: Collegiality & professionalism

Learning Goals

Random Acts of Improvement

Aligned Acts of Improvement (integrated and results oriented)
The Art and Science of Teaching

Nine Lesson Design Questions
1. Learning Goals and Feedback
2. Interacting with New Knowledge
3. Practicing and Deepening
4. Generating and Testing Hypotheses (application)
5. Student Engagement
6. Establishing Rules and Procedures
7. Adherence to Rules and Procedures
8. Teacher-Student Relationships
9. High Expectations

Today we will focus on Routine Lesson Strategies

ROUTINE SEGMENTS
- Component 1.1 (Goals/Scales)
- Component 1.2 (Celebrate Success)
- Component 5.1 (Organizing the Classroom)
- Component 5.2 (Rules/Procedures)
- Component 6.3 (Tracking Student Progress)

Do some Solo Thinking…
What are some key rules and procedures teachers need to establish for a successful learning environment?

Three Segments of a Lesson
1. Segments that involve routine behaviors.
2. Segments that address content in specific ways.
3. Segments that are enacted on the spot.

Routine Segments

Learning Goals and Feedback
Rules and Procedures

Student Engagement
Adherence to Rules and Procedures
High Expectations

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Routine Segments

Learning Goals and Feedback
Rules and Procedures

Student Engagement
Adherence to Rules and Procedures
High Expectations
Please compare lists with your elbow partners....

Did you list any of these?
- Attention and Refocus Signal
- Transition Signal
- Strategies to group and re-group learners
- Bell ringers or sponge activities

Page 2

Boosting Retention

<table>
<thead>
<tr>
<th>Retention Method</th>
<th>Average Retention Rate 24 Hours</th>
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<tbody>
<tr>
<td>Lecture</td>
<td>5%</td>
</tr>
<tr>
<td>Reading</td>
<td>10%</td>
</tr>
<tr>
<td>Audio-visual</td>
<td>20%</td>
</tr>
<tr>
<td>Demonstration</td>
<td>30%</td>
</tr>
<tr>
<td>Discussion Group</td>
<td>50%</td>
</tr>
<tr>
<td>Practice by doing</td>
<td>75%</td>
</tr>
<tr>
<td>Team roles/teams</td>
<td>90%</td>
</tr>
</tbody>
</table>

Adapted from David Sousa's figure 3.8 in his text, *How the Brain Learns*

Transition Signal....
- So they know for sure when you want them to move...
- Mine will be: When I say "GO"

My Attention and Refocus Signal
- Move to the front and center.
- Announce time remaining in activity.
- Count down last 10 seconds out loud.
- At "Zero" everyone is in seat and ready.
- If anybody isn’t ready, I’ll just wait....

Attention and Refocus Signals
- Consistent Location (Physical Cue)
- Consistent Language (Verbal Cue)
- Expected Result
- Sound of Silence

Processes for grouping and re-grouping learners.

Table Team or Table Family
- Everyone at your table...
- Best if groups are 5 or smaller...
  - Use teams of teams to stay below 5

Age = Attention Span
- Change of state for the learner is needed...
- Tops out at 18-20 minutes...
- Adult learners need change also...
Each team needs a facilitator...

- When I count to 3 everybody point at someone at your table...
- Person with the most pointing at you please stand up...
- You get to pick the facilitator for the group.

Close Partners

- Groups of 2 or 3 with people sitting near you but not at your table.

Across the Room Partners...

- Groups of 2 or 3 with people not sitting near you in the room.
  - Cross-town Buddies
  - Blind Date

Elbow Partners....

- Groups of 2 or 3 to your left and/or right...
- You could elbow them...but please don’t
  - Stand when working with elbow partners

Speed Date Discussions

- 1 minute discussion (group of 2 or 3)
- 10 seconds find new partners
- 1 minute discussion....
- Repeat as needed...

Learning Appointments

- Schedule learning appointments with groups of 2 or 3.
- Record your appointments so you remember who you are meeting with.

Some important considerations

- Why 5 or less?
- Why groups of 2 or 3?
- Why use more than one strategy?

What other grouping strategies do you use?

Please share your ideas with your table family
Additional Ideas...

- What problems of practice can you address by implementing a classroom routines or procedure?

OUR CLASSROOM NORMS

Teacher will:
- Be creative and allow creativity
- Allow engaging texts
- Allow choice in class
- Allow student directed discussion/collaboration
- Accept multiple interpretations
- Have fun
- Help students connect and understand
- Show Respect
- Offer tutorials
- Be specific in feedback
- Motivate us
- Meet us at our level

Students will:
- Stay focused
- Produce Quality Work
- Show Respect
- Be Diligent
- Participate
- Don’t press up against the door before bell rings
- Trust
- Be honest
- Be on time
- Turn in work on time
- Try hard
- Aim high – for a 4 or 5
- Be kind to each other in class
- Agree on the path
- Stay in and believe

ROUTINE SEGMENTS

- Component 1.1 (Goals/Scales)
- Component 1.2 (Celebrate Success)
- Component 5.1 (Organizing the Classroom)
- Component 5.2 (Rules/Procedures)
- Component 6.3 (Tracking Student Progress)

PLC Questions #1 and #2

1. What do we want our students to learn?
2. How will we know if they have learned it?
3. What will we do if they have not learned what we want them to learn?
4. What will we do if they already know it?
Learning Goals
Implementing the curriculum at the classroom level.

Learning Goals and Scales
Implement the curriculum at the classroom level.

What are learning goals?
A learning goal is a statement of what students will understand and/or be able to do.

Think in Terms of Two Types of Goals…

Professional Dialogue
How do you communicate learning goals to your students?

For each area of teacher expertise:

Distinguished
Adapts and creates new approaches to the strategies for unique student needs and situations

Proficient
Uses the strategies; monitors effects on students; adjusts to achieve desired outcome

Basic
Uses the strategies in this area of teacher expertise

Unsatisfactory
Uses strategies incorrectly or with aspects missing

Formative Assessment
Focus on Learning
Review the following research descriptions…
“the process used by teachers and students to recognize and respond to student learning in order to enhance that learning, during the learning.” (Cowie & Bell 1999 p. 32)

“assessment carried out during the instructional process for the purpose of improving teaching or learning” (Shepard et al., 2005, P. 275)

"Formative assessment refers to frequent, interactive assessments of students’ progress and understanding to identify learning needs and adjust teaching appropriately” (Looney, 2005, P. 21)

“A formative assessment is a midstream tool to identify specific student misconceptions and mistakes while the material is being taught” (Kahl, 2005, p. 11)

**Discussion Topic**
- What does formative assessment mean to you?
- What are your current strategies for formative assessment?

**The Challenge**
Goals must be challenging, yet attainable for students.

**Students come with unique gaps in their abilities and previous learning.**

"I have over 25 students in my class."

**Problem:**
How can I write a goal for all my students that is both challenging and attainable?

**Solution:**
Construct goals at multiple levels of difficulty.

**Create Proficiency Scales**

"I have over 25 students in my class."

**At the Classroom level...**
- We need goals at various levels that....
- Identify Learning Progressions which....
- Are necessary to achieve a Target Goal.
Begin by designing (and prioritizing) learning goals in all subject areas.

What’s a guaranteed and viable curriculum?
- A “guaranteed” curriculum means that we ensure it is taught in every classroom teaching the same course.
- Examples:
  - All English I classes have the same essential learning targets identified.
  - All Biology classes have the same essential learning targets identified.
  - The Algebra I story....

Viable Curriculum
- Viable means we are able to teach the curriculum for understanding in the time available.
- Teach for understanding....

Identify Essential Learning
Step One.

What are the criteria for essential?
- **Endurance** (Will this provide knowledge and skills that will be of value beyond a single test date?)
- **Leverage** (Will this provide knowledge and skills that will be of value in multiple disciplines?)
  - Inquiry, critical thinking, inferences, problem solving
- **Readiness** for next level of learning (Will this provide students with the "tools" they need for success at the next level or grade.)

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Adapted from McTighe & Wiggins

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Discussion Topic
What does it mean to have a guaranteed and viable curriculum?

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Nicely Know
Supplemental

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Essential Learning Target Matrix

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References:
Welcome Back!
Let's Review

Things Associated With Yesterday

Instructional Framework
Expertise
Routine Segments
Retention
Focused Feedback

MORE Things Associated With Yesterday

Professional Growth
Domain 1
Pedagogical Skills
Learning Goals
Dr. Phil

Using the Matrix...

- PLCs and/or Departments
- Discuss the standards, use the matrix.
- Not everything will make the list....

“For these are all our children. We will profit by, or pay, for whatever they become.”

James Baldwin

Talk a Mile a Minute

- Students are given a list of terms that have been organized into categories.
- Each team designates a talker.
- The talker tries to get the team to say each of the words by quickly describing them.
- The talker is allowed to say anything about the terms while talking but may not use any words in the category title or any rhyming words.
- The talker keeps talking until the team members identify all terms in the category.
- If members of the team are having difficulty with a particular term, the talker skips it and comes back to it later.
Question about teaching the learning goal.

When you begin a new piece of knowledge... The first time learners are exposed to it.

Scales = a series of learning goals or learning progressions

Organize learning goals into a scale

- Advanced = 4.0 More complex learning goal
- Above and beyond the target goal
- Proficient = 3.0 target learning goal
- At the level identified in the standards
- Progressing = 2.0 simple learning goal
- Foundational knowledge needed to reach level 3

Basic Proficiency Scale

4
In addition to exhibiting level 3 performance, in-depth inferences and applications that go BEYOND level 3.

3
The Learning Goal: What you expect the student to know and be able to do to be considered proficient.

2
The simpler or foundational knowledge that is necessary as a step to mastery of the score 3.0

1
With HELP, a partial knowledge of some of the simpler and complex details and processes. Even with help, no understanding or skill demonstrated

Proficiency Scales

Learning Goal Only

- Explain the advantages and disadvantages of three types of business ownership.

Atmospheric Processes and Water Cycle

4
Infer relationships regarding atmospheric processes and the water cycle.

3
An explanation of:
- How the water cycle processes impact climate changes
- The effects of temperature and pressure in different layers of Earth's atmosphere

2
Recognize and recall basic terms such as: climatic patterns, atmospheric layers, stratosphere, troposphere.
- Recognize or recall isolated details such as:
  - Precipitation is one of the processes of the water cycle.
  - The troposphere is one of the lowest portions of the Earth's atmosphere
What about Special Education?

Special Ed. and Scales...
- Accommodations or Modifications?
- Accommodations = Regular Scale if we properly meets accommodations.
- Modifications = Modify scales in conjunction with the IEP goals.

Consider having students flesh out the meaning of the scale.

I know it just the way my teacher taught it.
I know it even better than my teacher taught it.
I know some of the simpler stuff but can’t do the harder parts.
With some help, I can do it.
We live in a data-driven world

PLC Question # 2

- How will we know if our students have learned what we want them to learn?

We can get data-driven to the point of distraction.

Data-based decisions are not about gathering reams of data. They are about gathering useful, timely data.

We need timely, usable data.

Critical data-based decisions:
- Come from classroom assessments.
- Occur frequently... (even daily)
- Are specific regarding performance.
- Are focused on growth.
- Lead directly to learning.

Response to Intervention

Intensive

Targeted

Universal
Marzano Research Laboratory will help you!

- Website
  - http://www.marzanoresearch.com
- Free resources
- Proficiency Scale Bank
- Email for user name
- Pick a password

Provides Samples to Select...

PLC Question #2

- How will we know if our student’s have learned what we want them to learn?

Now, you can more accurately connect assessment items or opportunities to the scale = construct validity.

Three types of assessment items to measure the knowledge and skills defined

- Level 2 Items: Simpler details and processes that have been explicitly taught
- Level 3 Items: Complex ideas and processes that have been explicitly taught
- Level 4 Items: Inferences and applications that go beyond what was taught
With your table family...

- Using the proficiency scale for Atmospheric Pressure and Water Cycle...
  - Develop 1 assessment item for level 3.
  - Develop 1 assessment item for level 2.
  - Develop 1 assessment item for level 4.

Atmospheric Processes and Water Cycle

4. Infer relationships regarding atmospheric processes and the water cycle.
   - An explanation of:
     - How the water cycle processes impact climate changes
     - The effects of temperature and pressure in different layers of Earth’s atmosphere

3. Recognize and recall basic terms such as: climatic patterns, atmospheric layers, stratosphere, troposphere.
   - Precipitation is one of the processes of the water cycle.
   - The troposphere is one of the lowest portions of the Earth’s atmosphere.

Level 2.0 Items for Measuring Atmospheric Processes and Water Cycle

- Briefly define the following terms: climatic pattern, atmospheric layers, stratosphere
- Identify which of the following statements are true:
  - The atmosphere is between the troposphere and the stratosphere.
  - The Earth’s atmosphere helps protect life on Earth by absorbing ultraviolet radiation.
  - The temperature of the Earth’s atmosphere varies with altitude.

Level 3.0 Items for Measuring Atmospheric Processes and Water Cycle

- Explain how evaporation affects the climatic pattern in areas around large bodies of water, like the shoreline communities of Lake Michigan.
- Assume that a weather balloon traveled up into the stratosphere. Explain what would happen as it progresses through the various layers of the atmosphere.

Level 4.0 Item for Science Test on Atmospheric Processes and Water Cycle

Complete the following analogy and explain why it is accurate:
Condensation is to evaporation as __________ is to __________, because...

Tracking Student Progress

- Occurs formally and informally
- Empowers teachers to provide valuable feedback.

Interesting research about feedback...

Routine Segments

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Predict the effect on student achievement for each type of feedback.
### Types of Feedback

<table>
<thead>
<tr>
<th>Type of Feedback</th>
<th>Number of Studies</th>
<th>% Student Achievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gain or Loss</td>
<td>6</td>
<td>3%</td>
</tr>
<tr>
<td>Right or Wrong</td>
<td>39</td>
<td>8.5%</td>
</tr>
<tr>
<td>Teacher provides correct answers</td>
<td>30</td>
<td>16%</td>
</tr>
<tr>
<td>Students understanding assessment criteria vs. not understanding</td>
<td>39</td>
<td>20%</td>
</tr>
<tr>
<td>Teacher explains feedback</td>
<td>9</td>
<td>20%</td>
</tr>
<tr>
<td>Student reassessed until correct</td>
<td>4</td>
<td>16%</td>
</tr>
</tbody>
</table>

Bangert-Crowns, Kulik, Kulik, & Morgan.

### An interesting finding...(Carless, 2006)

- Asked students and teachers whether teachers provided detailed feedback that helped students improve their next assignments...
- 70% teachers claimed they provided such detailed feedback often or always
- 45% of students agreed with their teachers' claims

### Grading & Feedback Study

- Grade only
- Feedback only
- Grade and feedback combined...
- Which group do you think showed the greatest student achievement?

- Grade only
- Feedback only
- Grade and feedback combined

- Unfortunately, the grade "trumps" the comments if used together.

- Effects of no feedback, task-related comments, and grades on intrinsic motivation and performance. Journal of Educational Psychology, 10, 211-224.

### How often have you seen another student at your school...

- Copy someone else's homework?
  - Every Day = 19.9%
  - Many Times = 25.5%
  - A Few Times = 31.9%
  - Once 10.1%
  - Never 12.6%

- RRSH student climate survey 2009-2010

### New app aims to turn Facebook into a study tool

- The Facebook application Hoot.me diverts students away from their wall and news feed and asks them, “What are you working on?” It then connects students with live group-study sessions on their chosen topic.

### Teachers should not abandon homework. Instead, they should improve its instructional quality.

- Robert Marzano
  - Educational Leadership, March 2007

### Have students correct their own!

- Aligns with feedback research
  - Timeliness
  - Teacher explains answers/corrections
  - Becomes OK to make an error (Learning)

- Provides formative information to the student and doesn’t have to be scored.
Homework quiz strategy.

- Homework becomes practice and instructional feedback.
- It also becomes the best way to study for the homework quiz.
- The homework quiz becomes a formative assessment or score.
- Serves as one piece of evidence of learning.

Feedback is most powerful when it comes from the student to the teacher.

“Feedback from student to teacher helps make learning visible” (Hattie, 2009).

- Teachers seek
  - What do students know and understand?
  - Where are they making errors?
  - When do they have misconceptions?

Quick Formative Assessment

Instructional Feedback

Exit Tickets and Student Surveys

Quick to yield data:
- Don’t have to be formal
- Can occur on a note card or paper
- Used for any subject matter
- At numerous grade levels

Polleverywhere.com

More formal formative assessment.
Having Students Chart Their Progress on Learning Goals

- 14 experimental–control studies conducted at Marzano Research Laboratory

- In research to date, this practice is associated with a 32-percentile point gain in student achievement.

Consider also tracking effort and preparation....
My Progress in Writing Process—Content and Organization

H.S. History Teacher St. Louis

- Tracks student progress academically as correlated to preparation.
- Homework, test review guide, essay outline
  - Completed all three = Ave grade on test
  - Completed two = Ave grade on test
  - Completed one = Ave grade on test
  - Complete non = Ave grade on test

What has he found???

- Usually 30 points or more difference in the test between most and least prepared.
- Kids are shocked first time or two and many begin to prepare better.
- Makes excellent data for parent teacher conferences.

Group discussion…

- How do you track student progress?
- What informal and formal methods do you use for formative assessment?

Discussion…

- What do you do to celebrate the success of your learners?
Little things….Big differences….

- ATLAS program celebrations

- High school students not on track to graduate…some had dropped out once.