



JAMES MADISON UNIVERSITY.

Madison

You Can Lead Students to School, but Can You Make Them Think?

**Content Teaching Academy
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dyson



What is Innovation?



***You Can Lead Students to School,
but Can You Make Them Think?***



smart thinking

Raw Intelligence



smart thinking



Develop smart habits



Acquire high quality information



Apply what you know to new situations

Smart thinking comes from
smart teaching.



The Human Line Graph



**I select
learning
strategies that
research says
increases
student
learning and
achievement.**

**I don't really
know what
the research
says about the
learning
strategies I
use.**

The Human Line Graph



I teach as much as possible and hope that it is enough to cover what is on the SOL test.

I know the essential knowledge and skills my students are expected to know and be able to do.

The Human Line Graph



I am confident
that I teach for
understanding.

Teaching for
understanding?
What's that? I
teach to the
test!

What is **SMART TEACHING?**



Do you use research-based or evidence based strategies?



Do you teach the essential knowledge and skills?



Do you teach for understanding?



Evidence-Based Strategies

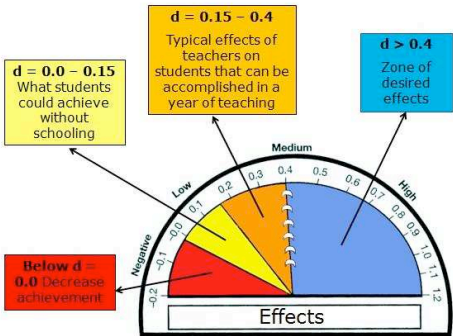
Homework	High	Medium	Low
Concept Mapping	High	Medium	Low
Cooperative Learning	High	Medium	Low
Ability Grouping	High	Medium	Low
Use of Calculators	High	Medium	Low
Reciprocal Teaching	High	Medium	Low
Formative Evaluation	High	Medium	Low
Web-Based Learning	High	Medium	Low
Teaching Test Taking	High	Medium	Low



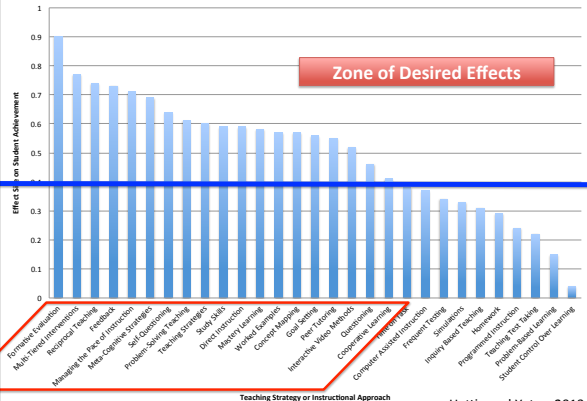
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Barometers of Influence



Teaching Effects

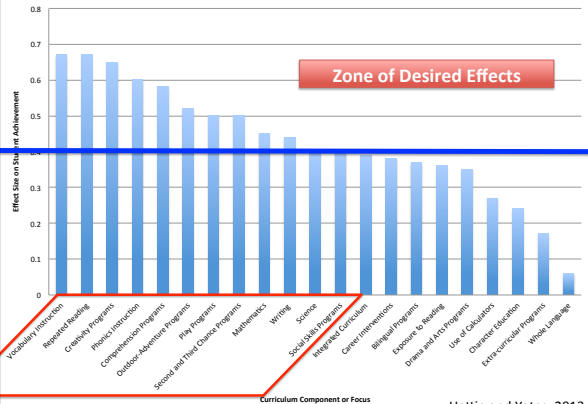




Do you use research-based or evidence based strategies?

- Formative Evaluation
- Multi-Tiered Interventions
- Reciprocal Teaching
- Feedback
- Managing the Pace of Instruction
- Meta-Cognitive Strategies
- Self-Questioning
- Problem-Solving Teaching
- Teaching Strategies
- Study Skills
- Direct Instruction
- Mastery Learning
- Worked Examples
- Concept Mapping
- Goal Setting
- Peer Tutoring
- Interactive Video Methods
- Questioning
- Cooperative Learning

Curricular Effects





Do you use research-based or evidence based strategies?

- Vocabulary Instruction
- Repeated Reading
- Creativity Programs
- Phonics Instruction
- Comprehension Programs
- Outdoor-Adventure Programs
- Play Programs
- Second and Third Chance Programs
- Mathematics
- Writing
- Science
- Social Skills Programs

I used to think...

Now I think...



1. Typical Plant Structures

**2. Structures and Processes
Involved in Plant Reproduction**

3. What is photosynthesis?

**4. Examples of How Plants
Respond to the Environment**



Essential Knowledge and Skills

Life Processes

- 4.4 The student will investigate and understand basic plant anatomy and life processes. Key concepts include
- a) the structures of typical plants and the function of each structure;
 - b) processes and structures involved with plant reproduction;
 - c) photosynthesis; and
 - d) adaptations allow plants to satisfy life needs and respond to the environment.

Essential Knowledge, Skills, and Processes

In order to meet this standard, it is expected that students will

- analyze a common plant: identify the roots, stems, leaves, and flowers, and explain the function of each.
- create a model/diagram illustrating the parts of a flower and its reproductive processes. Explain the model/diagram using the following terminology: pollination, stamen, stigma, pistil, sepal, embryo, spore, seed.
- compare and contrast different ways plants are pollinated.
- explain that ferns and mosses reproduce with spores rather than seeds.
- explain the process of photosynthesis, using the following terminology: sunlight, chlorophyll, water, carbon dioxide, oxygen, and sugar.
- explain the role of adaptations of common plants to include dormancy, response to light, and response to moisture.

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BLOOM'S REVISED TAXONOMY

Higher-order thinking

Creating

*Generating new ideas, products, or ways of viewing things
Designing, constructing, planning, producing, inventing.*

Evaluating

*Justifying a decision or course of action
Checking, hypothesising, critiquing, experimenting, judging*

Analysing

*Breaking information into parts to explore understandings and relationships
Comparing, organising, deconstructing, interrogating, finding*

Applying

*Using information in another familiar situation
Implementing, carrying out, using, executing*

Understanding

*Explaining ideas or concepts
Interpreting, summarising, paraphrasing, classifying, explaining*

Remembering

*Recalling information
Recognising, listing, describing, retrieving, naming, finding*

I used to think...

Now I think...





Teaching for Un

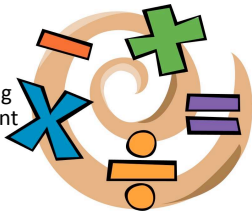




Bloom's verbs are the means for *teaching for understanding*.

Students **demonstrate** greater **conceptual understanding** and ability to **transfer** to novel problems when...

- (a) they are taught the content (procedures) first and then engage in problem-solving exercises.
- (b) they engage in problem-solving and are then taught the content (procedures).
- (c) they first observed failed problem solving attempts by their peers.



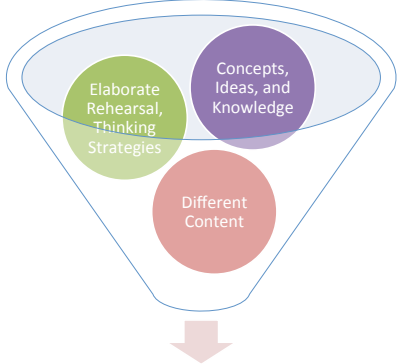
1. they engage in problem-solving and are then taught the content (procedures).
2. they first observed failed problem solving attempts by their peers.
3. they are taught the content (procedures) first and then engage in problem-solving exercises.

Characteristics of Elaborate Rehearsal...

1. Does not rely on definitions but **r**_____ **des**_____.
2. Represents concepts in **li**_____ and **non**_____ ways.
3. Involves the gradual shaping of understanding through **multiple ex**_____.
4. Teaches **concepts in p**_____.
5. Varies in_____ depending on the concept.
6. Has students **di**_____ concepts.
7. Requires students to **p**_____ with concepts.
8. Includes vocabulary necessary for **ac**_____ **su**_____.

Strategies designed for thinking should...

1. Ask students to **observe** and **describe** what they “see”.
2. Build **explanations** and **interpretations**.
3. **Reason** with **evidence**.
4. Make **connections**.
5. Consider different **viewpoints** and **perspectives**.
6. Capture the **big idea** and **form conclusions**.
7. Promote inquiry or the **asking of more questions**.
8. Uncover the **complexity** by going **below the surface**.



Transfer

I used to think...

Now I think...



SMART TEACHING



Use research-based or evidence based strategies



Identify and teach the essential knowledge and skills



Teach for understanding



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