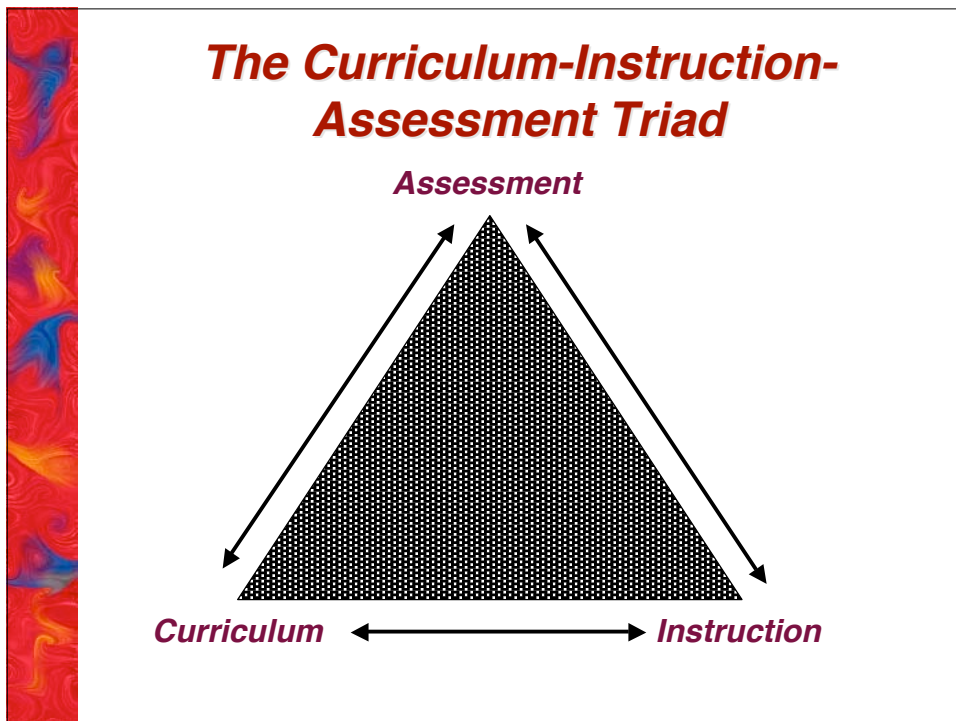
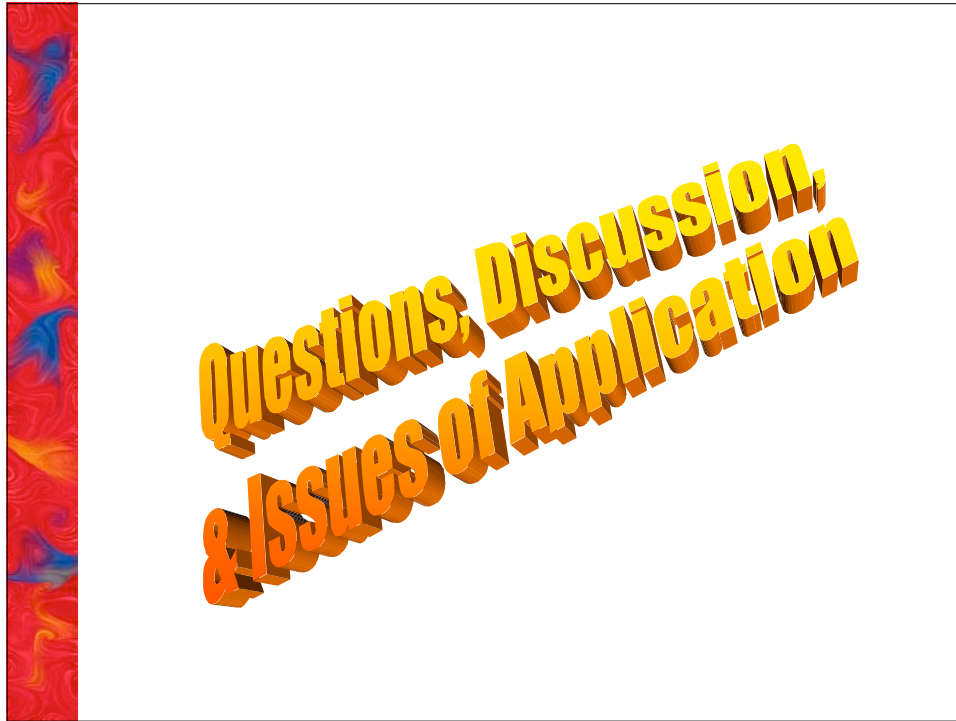
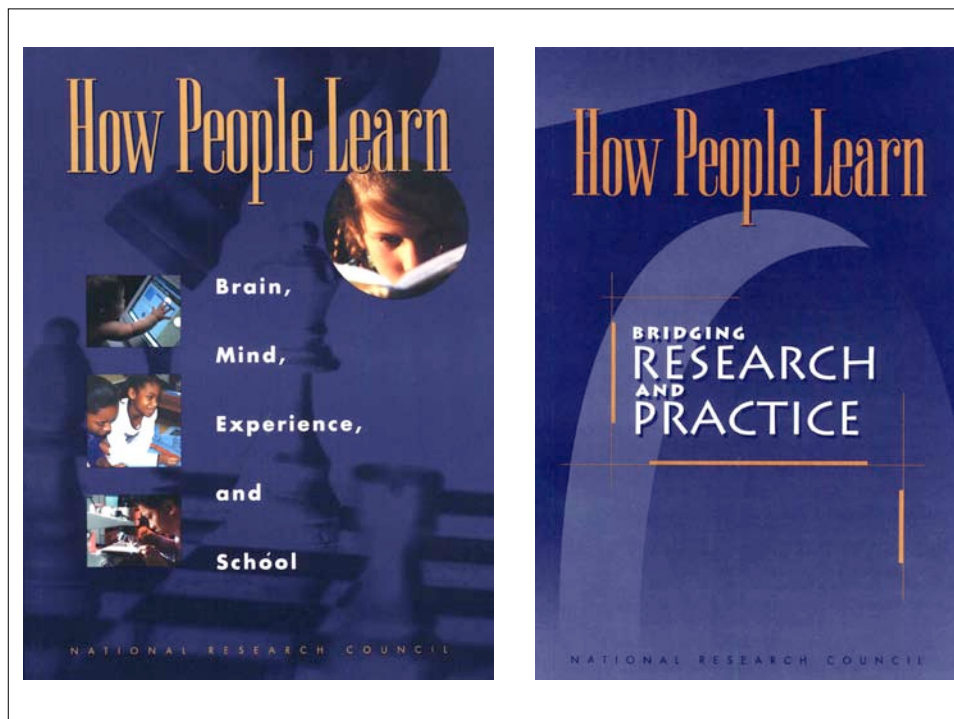
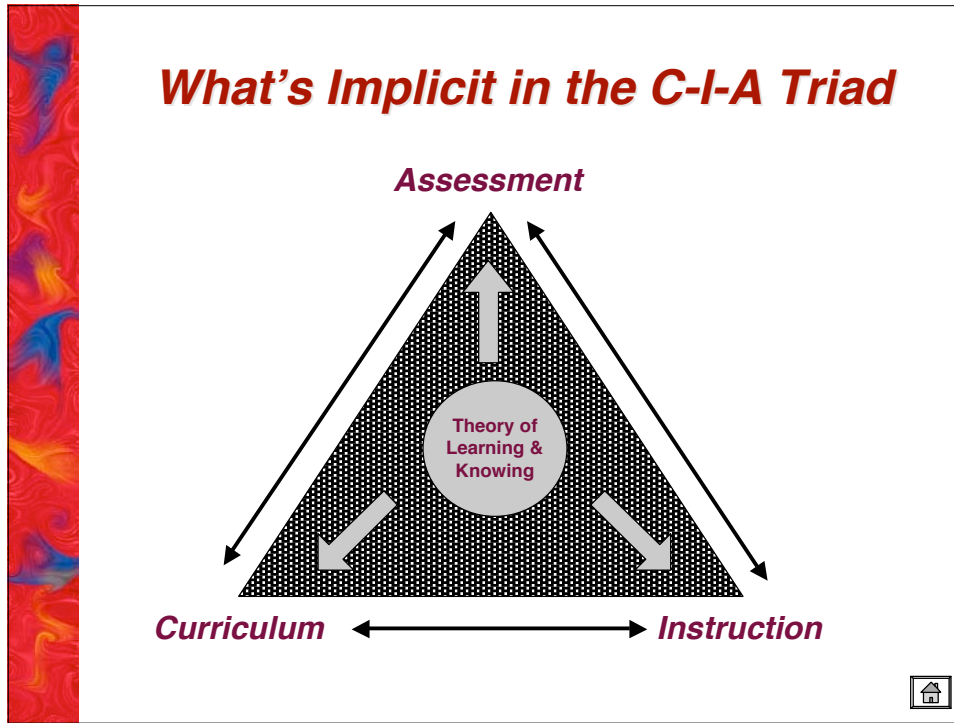


Overview

- Key Ideas & Applications to Literacy**
 - How theories of learning & knowing impact Curriculum, Instruction & Assessment
 - Knowledge about *How People Learn & Knowing What Students Know*
- What We Know About Reading & Literacy**
- Having Some Fun with Comprehension**
- Exploring Some Materials & Resources**
- Beyond “HPL” & “KWSK” -- Issues of Bridging Research and Practice**
- Reflections & Some Final Comments**







The Importance of a Contemporary View of How People Learn

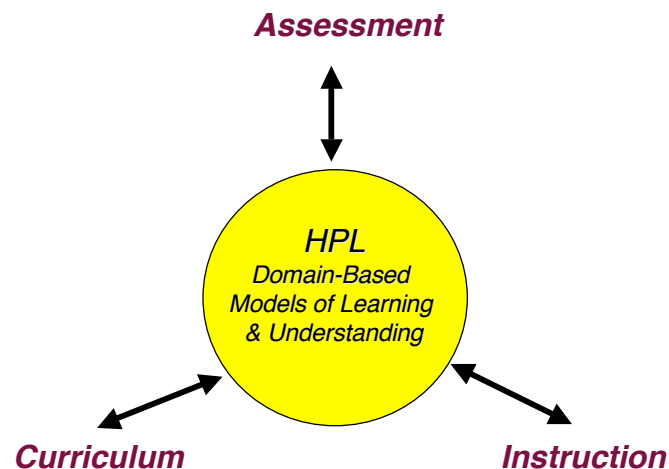
- ❑ Constitutes the theory & knowledge base that sits at the core of the C-I-A triangle
- ❑ It impacts how we should conceptualize each of the three vertices -- Curriculum, Instruction, Assessment
- ❑ It is critical to how we should think about their correspondence and interaction



Advances in Sciences of Thinking & Learning

- ❑ The most critical implications for C-I-A are derived from study of the nature of expertise and the development of competence in specific curriculum domains.
 - The nature of expertise
 - The influence of pre-existing knowledge
 - Learning with understanding
 - Metacognitive knowledge & skill
 - Multiple paths to competence
 - Situated knowledge and expertise

Domain-Based Models as “Core”



An Ongoing Concern

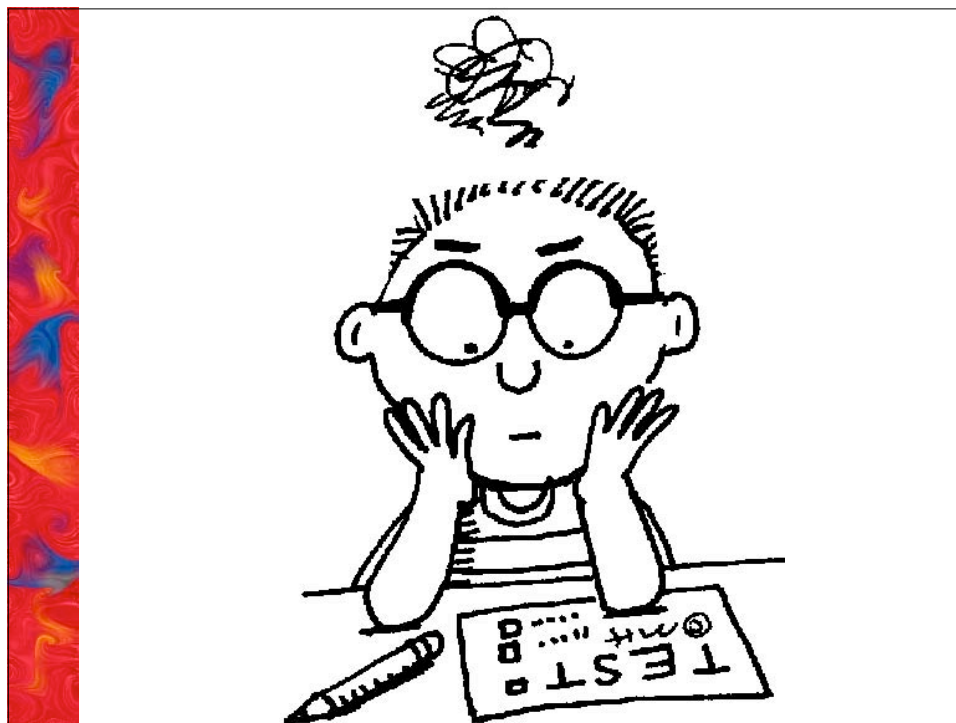
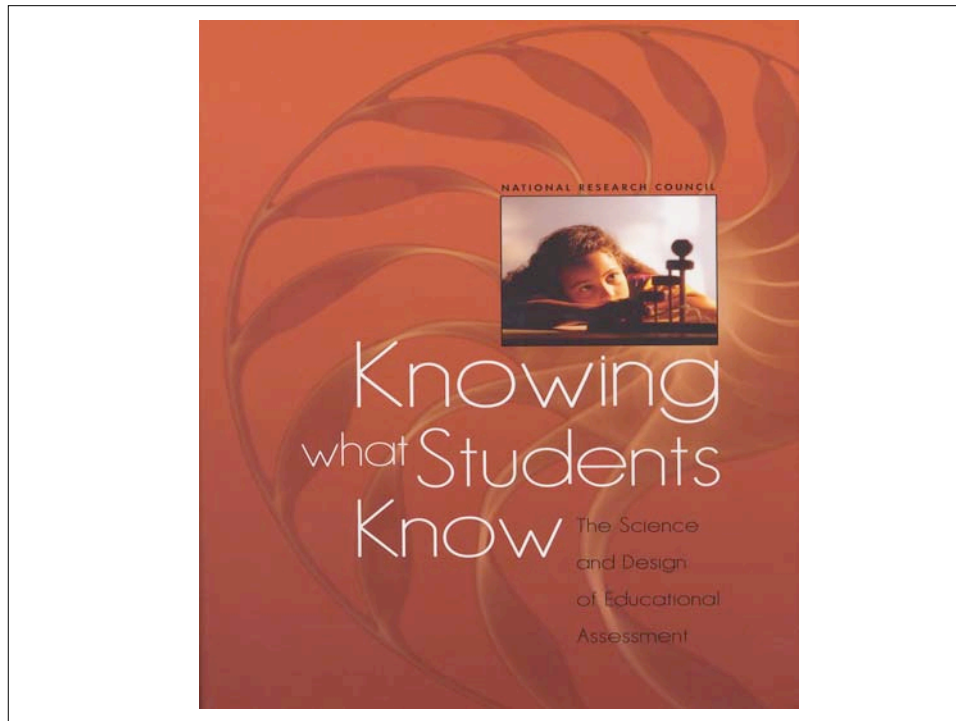
- ❑ Status of knowledge about HPL in various instructional domains across K-16
 - Scope and richness of the knowledge base
 - Theory and empirical data on multiple aspects of HPL in a given domain or subdomain
 - Some domains have rich data and theory whereas others remain impoverished
- ❑ In the absence of specific data and theory we can still rely on general principles about HPL

Some Major Implications of HPL for the C-I-A Triad

- ❑ Curriculum --Transcending false dichotomies about the goals of instruction
 - e.g., facts vs thinking skills
 - Focus on the organization of concepts
- ❑ Instruction -- Helps bring order to “chaos”
 - debates about constructivism & instructional strategies
- ❑ Assessment -- The process of “*Knowing What Students Know*”
 - Why assessment is critically important
 - What to assess and how to do so

Knowing, Learning, & Teaching

- ❑ Constructivism is a theory of the nature of knowing, including how we understand and learn; it is not a theory of pedagogy.
- ❑ There are many misconceptions regarding this point, e.g., ideas that we should never “lecture” or engage in direct teaching.
- ❑ Critical to understand the complex relationships between theories of knowing and learning and theories of instructional design and teaching.



Assessment as a Process of Reasoning From Evidence: The Assessment Triangle

□ cognition

- model of how students represent knowledge & develop competence in the domain

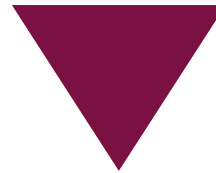
□ observations

- tasks or situations that allow one to observe students' performance

□ interpretation

- method for making sense of the data

observation interpretation



cognition

Must be coordinated!

Why Cognitive Models of Content Knowledge are Critical

□ Tell us what are the important aspects of knowledge that we should be assessing.

- Give deeper meaning and specificity to standards

□ Give us strong clues as to how such knowledge can be assessed

- Suggest what can and should be assessed at points proximal or distal to instruction

□ Can lead to assessments that yield more instructionally useful information -- within and across levels and contexts

□ Can guide the development of systems of assessments

- Comprehensive, Coherent & Continuous

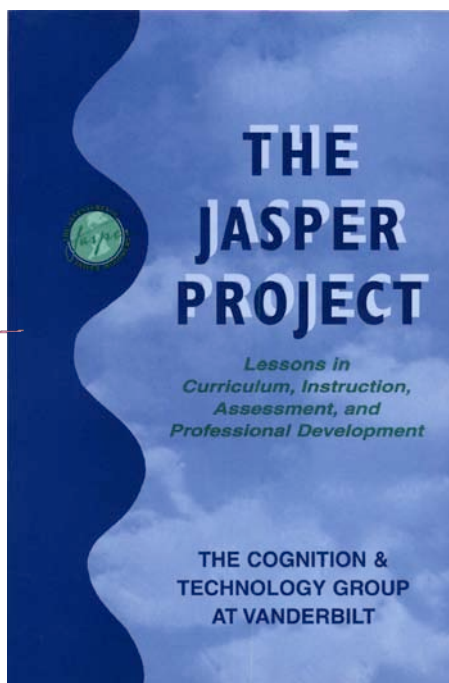
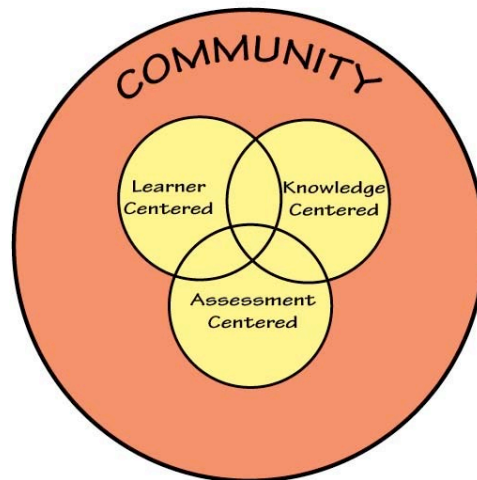
Aspects of Student Models

- ❑ Domain specific and empirically based
- ❑ Identifies cognitive performances that differentiate expert and novice learners
- ❑ Lays out one or more typical progressions toward competence including milestones or landmark performances along the way.
- ❑ Can be at various levels of detail; grain size depends on assessment purpose

Why Focus on Classroom Formative Assessment?

- ❑ As instruction is occurring, teachers need information to evaluate whether their teaching strategies are working.
- ❑ They also need information about the current understanding of individual students and groups of students so they can identify the most appropriate next steps for instruction.
- ❑ Students need feedback to monitor their own learning success and to know how to improve.
- ❑ Black & William (1998) reviewed impact of formative assessment practices on learning outcomes -- effect sizes ranging from .5 - 1.0

***Technology Is A Means To An End:
Tools to support the creation and enactment of
more powerful learning environments***



Anchored Instruction: “Adventures of Jasper Woodbury”



Complex Trip Planning

Journey to Cedar Creek
Rescue at Boone's Meadow
Get Out the Vote



Statistics and Business Plans

The Big Splash
Bridging the Gap
A Capital Idea



Geometry

Blueprint for Success
The Right Angle
The Great Circle Race



Algebra

Working Smart
Kim's Komet
The General is Missing

A Second Example of Materials Based on Cognitive Research



- The Little Planet Literacy Series
- “The Magic Hat”
- Anchored instruction approach to support the development of reading & literacy
- Multiple components in the program including basic skill building

Little Planet Literacy Series

- Video-based story
- Software for supporting comprehension and story writing.



Connecting with Classroom Practice

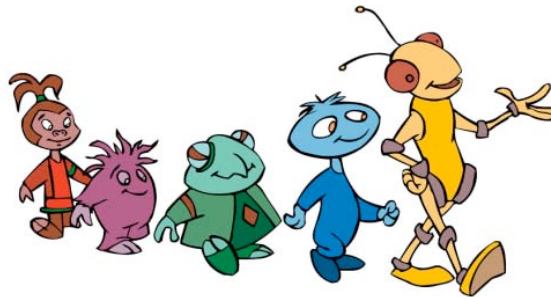
- Implementation models developed in collaboration with classroom teachers.**
 - 97-98: 12 classrooms;
 - 98 - 01 ~ 27 classrooms;
 - Commercial product: 1000+ classrooms
 - <http://www.sunburst.com/littleplanet/collections/index.shtml>
- Research sites showed**
 - Significant benefits for writing, total language (includes comprehension)
 - Decoding: Same as controls, even SFA controls
- Two observations suggested need for additional components**
 - Teachers spend considerable time on other decoding programs (struggle)
 - Potential for increased home involvement (video, print materials)

Current IERI Project (1999 - 2004)

- ❑ More powerful tools for technology-based support of decoding in school, as part of a balanced program of comprehension, writing, word knowledge and fluency.
 - Decoding in the context of meaningful informational texts.
 - ▲ Based on Cognitive Research - theories of lexicon representation
 - ▲ Emphasize Decoding Strategies
 - ▲ Highlight Several Levels of Word Analysis
 - ▲ Build a LARGE representational lexicon
 - ▲ Build Word-Recognition Fluency
- ❑ Tools for enhancing literacy habits at home

1999-2004 IERI (Take Me To Your Readers)

- ❑ Macrocontext: Encompassing story of a group of aliens who come to earth to learn to read
- ❑ Episodes (Modeling): children learn to help alien
- ❑ Tag ending: Specific tips for parents



Twelve Videotapes



- ❑ Four videos at 3 levels
 - (K, 1, 2)
- ❑ About 15 minutes each
- ❑ Each level has one video focusing on
 - Reading books
 - Talking about books
 - Building vocabulary and knowledge
 - Cracking the reading code

Books for Reading Practice


- ❑ Topics: Animal Secrets, People Secrets, Lost Stories
- ❑ Co-Reading Model
 - Combines controlled vocabulary with meaningful, natural text
 - Children practice words in bold print

Read and Learn

What animal is ten times as big as an elephant, has no teeth, is black and white, and is very playful?

Is it a huge penguin?

No, here is the secret. It's a humpback **whale!**



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quit replay


Humpback Whales - Day 1, Activity 1

Read and Learn

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Humpback Whales : Day 1, Activity 1

Word Practice

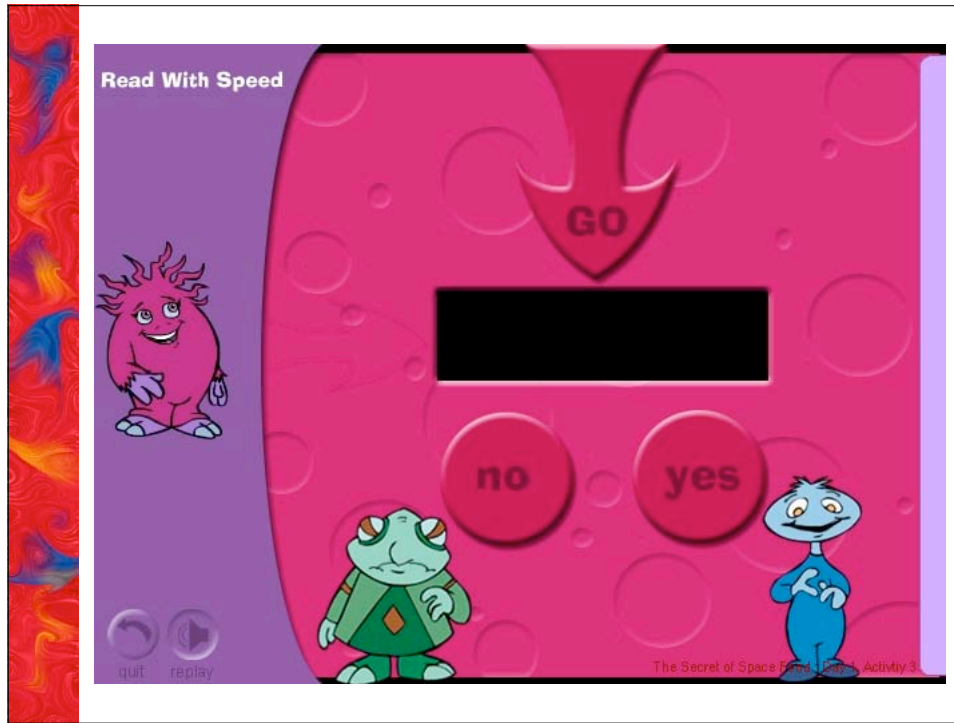
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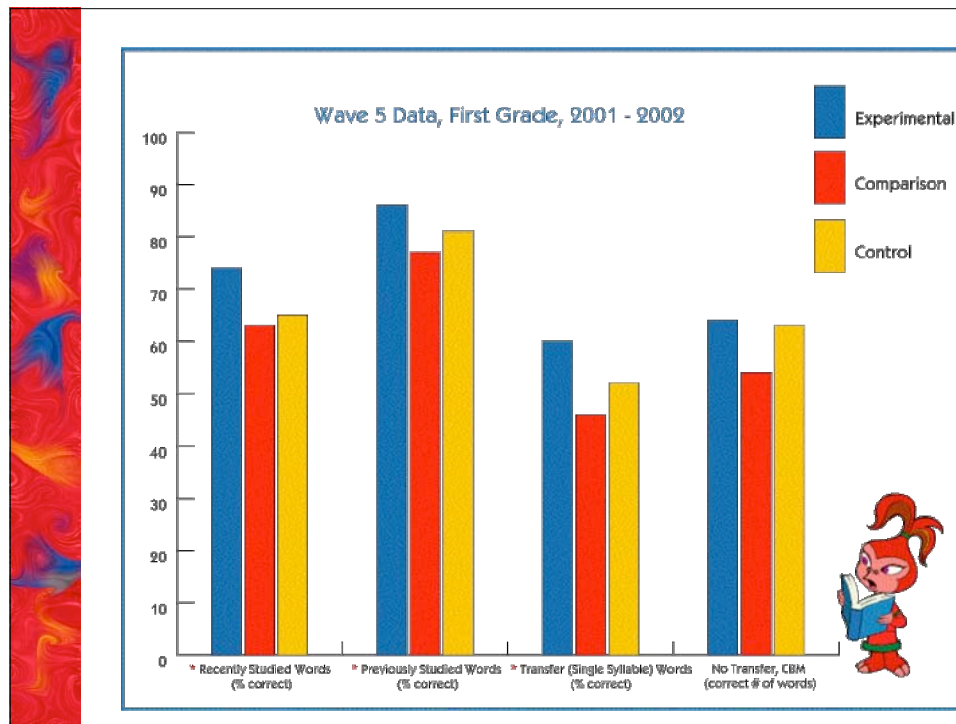


	ip	op	ill	ave	ame
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sh	★	★	★	★	★
wh	★	★	★	★	★

quit replay

Humpback Whales : Day 1, Activity 2





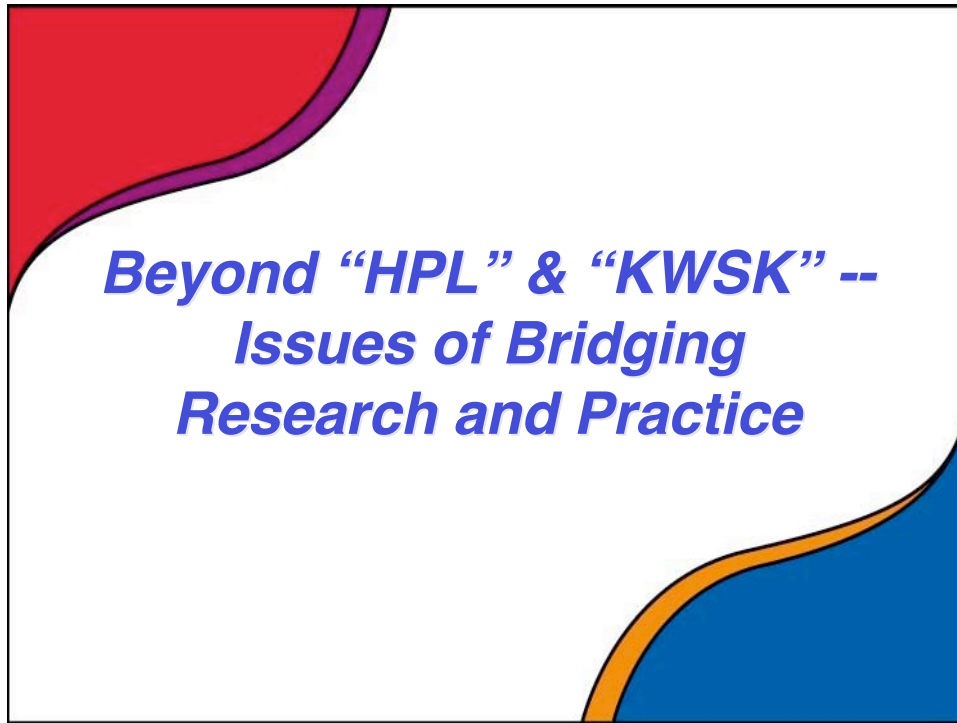
Parent Data

Parent Surveys on Videos:

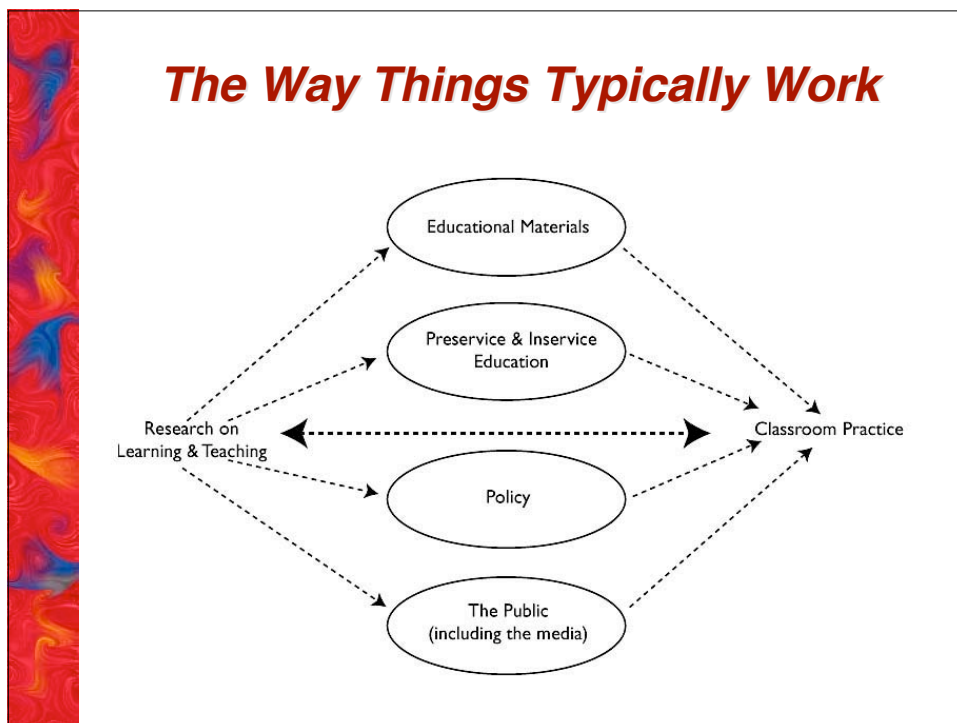
Fifty-four parents responded (rate of 55%)

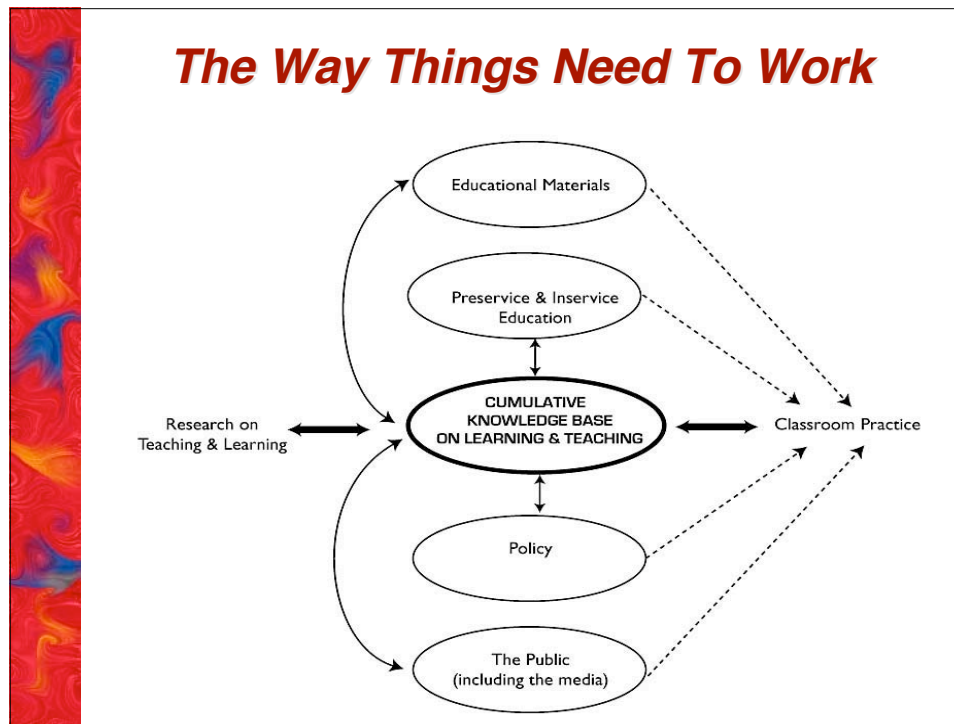
- 100% would recommend the videos to another parent
- 100% said the tips in the videos were helpful about how to help their child's reading
- 87% said they changed the way they read with their child because of something they learned from the videos
- 94% said the videos motivated them to use the public library more





***Beyond “HPL” & “KWSK” --
Issues of Bridging
Research and Practice***





- ### ***Applying an “HPL” & “KWSK” Frame of Reference to Educational Projects***
- ❑ Using the principles to evaluate the conceptual and operational basis of existing curricula, materials, and instructional designs
 - ❑ Using the principles to design new curricula, materials and instructional designs and to evaluate their effectiveness

Two General Concerns/Questions


Given the wide range of instructional materials, designs and/or programs currently available or under development for a given area of education, we need to ask:

- ▶ In what ways are they consistent or inconsistent with contemporary principles of learning, assessment & Instructional design?
- ▶ How might they be modified and improved to be more consistent?


- ▶ What is the nature of the conceptual coherence among curriculum-instruction-assessment for the target domain and population?

- ▶ What assumptions, if any, have been made about the development of competence and expertise in the domain and how is this reflected in the sequencing of content and/or in the selection of instructional strategies and learning activities?

- ▶ How does the instructional program take into account peoples' prior knowledge, beliefs, and preconceptions. Does it provide appropriate mechanisms for responding to such knowledge states?



- Is the development of metacognitive skills a component of the program? How might it be more effectively integrated into the design?
- What role(s) does assessment play in the design of the materials and instructional strategies and is it guided by a substantive theory of knowing and understanding in the subject area domain? What levels of knowing and understanding are the apparent targets of assessment?



Working in Pasteur's Quadrant

high	<i>Bohr</i>	<u><i>Pasteur</i></u>
low		<i>Edison</i>
	low	high

Theoretical Value

Practical Value



Limitations of Research

“Rarely does one study produce an unequivocal and durable result: multiple methods, applied over time and tied to evidentiary standards, are essential to establishing a base of scientific knowledge.”

Shavelson & Towne, 2002



Complexity of the Study Domain

“The character of education not only affects the research enterprise, but also necessitates careful consideration of how the understanding or use of results can be impeded or facilitated by conditions at different levels of the system. Organizational, structural, and leadership qualities all influence how the complex education system works in practice.”

Shavelson & Towne, 2002

WHAT Does NCLB Want?

- ❑ To determine with scientific rigor:
WHAT WORKS.

- ❑ Translation: The impact of the intervention must be to:
INCREASE TEST SCORES!

What is Required by the “What Works” Clearinghouse and NCLB

- ❑ Randomized, controlled, experimental studies, using the medical model of research.
- ❑ Not matched comparisons.
- ❑ Not quasi-experimental designs.
- ❑ Must establish causality, ruling out plausible explanations.
- ❑ Small, focused “interventions.”
- ❑ Limited teacher professional development components.
- ❑ Short-term.
- ❑ School patterns are not changed.
- ❑ Students are the unit of assignment, not classrooms or schools.
- ❑ No contextualization.

The Medical Model as the Gold Standard

- ❑ The Institute for Educational Sciences (IES) in the US Department of Education invokes the medical model of research as the standard toward which all research should strive.
- ❑ Yet is this gold standard achievable?
- ❑ Is it the right gold standard or a silver bullet?
- ❑ For example, can an instructional “intervention” be examined in the same way as a course of pharmaceutical treatment?

Research and Evaluation Methodology Required by NCLB: Randomized Field Trials (RFT's)

The rationale for RFT's is the quest for unambiguous information in education.

What is Scientific?

“To be scientific, the design must allow direct, empirical investigation of an important question, account for the context in which the study is carried out, align with a conceptual framework, reflect careful and thorough reasoning, and disclose results to encourage debate in the scientific community.”

Shavelson & Towne, 2002

The Six Guiding Principles of Scientific Inquiry ***(Not the Seven Deadly Sins)***

1. Pose significant questions that can be investigated empirically (ruling out counter interpretations and bringing evidence to bear on alternative explanations)
2. Link research to relevant theory
3. Use methods that permit direct investigation of the question
4. Provide a coherent and explicit chain of reasoning
5. Replicate and generalize across studies
6. Disclose research to encourage professional scrutiny and critique



Which Really is the Driving Factor - Research Questions or Methods?

- The question should drive the research methodology, not the research methodology driving the questions.
- Unfortunately, all too often the reverse has been happening because of political pressures.
- Mandated questions, methods, and potentially answers as well.

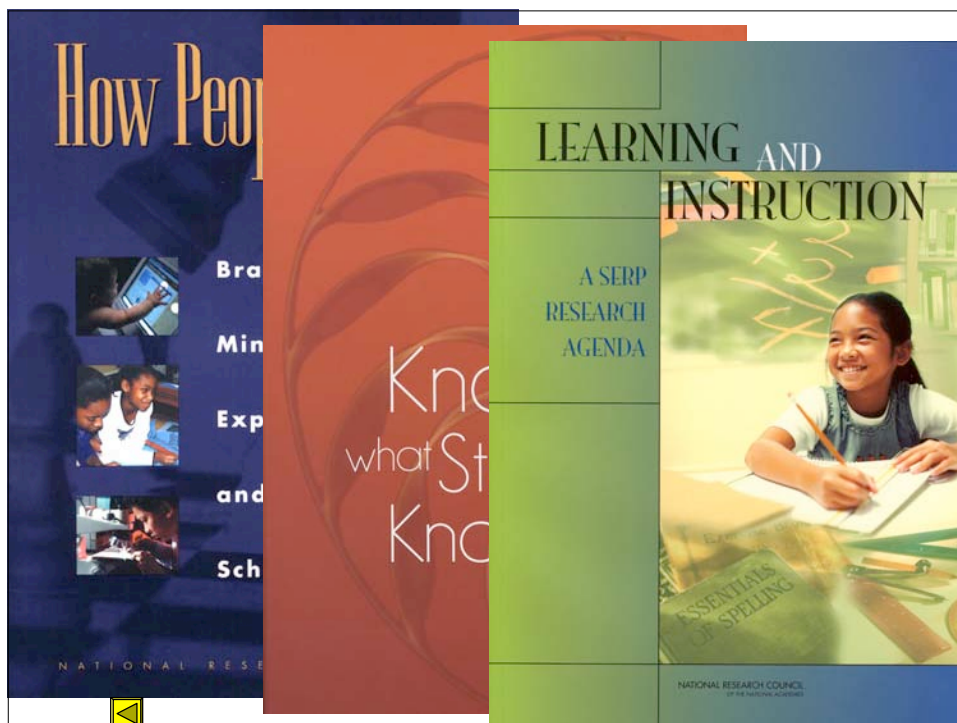


The Question Should Drive the Research Design

- What is happening (e.g., descriptions of population characteristics)?
- Is there a systematic effect (i.e., systematic means causal)?
- How or why does it happen?
- Need to account for contextual factors.
- Replicability of patterns across groups and time.

Numerous Caveats to RFT's

- Fidelity of implementation
- Variability of treatment
- Overlap between treatment and control groups
- Adequacy of outcome measures
- Multiple treatment interference
- Relevance of control condition to policy issues
- External validity



Projections Regarding the Future

- ❑ Learning environments will change profoundly - it's happening as we speak
- ❑ Individuals will exert significant control over their learning and learning environments
- ❑ What students can come to know and understand will increase dramatically
- ❑ Linguistic and cultural variation among learners can be accommodated as a normal part of the teaching-learning setting
- ❑ Expectations regarding the outcomes from education will increase several fold

Summary Points About Learning, Teaching, Assessment, & Technology

- ❑ There is a developing science of learning
- ❑ It has major implications for all aspects of schooling -- curriculum, instruction, assessment, plus preservice and inservice education, and faculty professional development
- ❑ It provides a basis for knowing when, how and why to use various instructional strategies; it can guide intelligent design and use of new curricular materials as well as information technologies

