

Problem-Solving Penpals: Preservice Teachers & Fourth Graders

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What is linking?

- A group of students enrolled in two or more existing courses related by content or skills development
- More than one way
 - a content-based course and skill course (e.g. a writing course and history course)
 - Content courses (US History and American Literature)

Our inspiration

- Our concerns
- Article
- Cognitively Guided Instruction

Why linking?

- Students were not making connections between methods classes
- Importance of a more integrated curriculum for undergraduates (Smith et al, 2004; Miller & McCartan, 1990)
- Help students make connections between the content in various courses (Hurd & Stein, 2004)
- The importance of building a learning community

Article

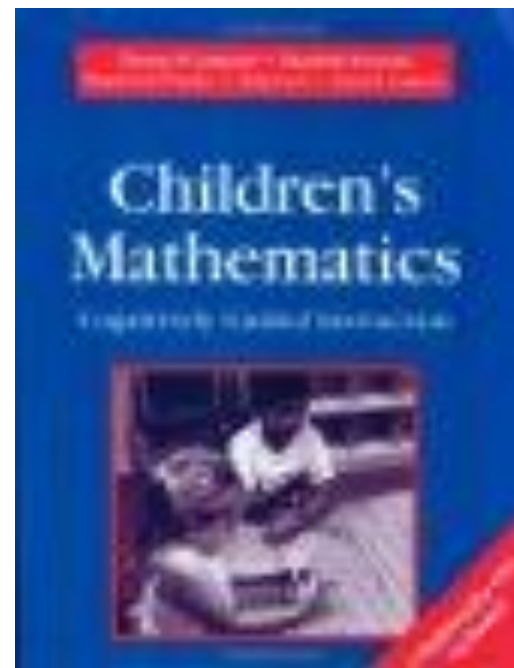
- **Pen Pals: Practicing Problem Solving**

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Cognitively Guided Instruction



Courses

- **ED 242: Numerical and Manipulative Math for Early and Special Learners**
 - current trends, technique, technologies, and research
 - classroom strategies, communication, and the use of manipulative tools

Courses

- **ED 250: Reading and Writing for Early and Special Learners**
 - Development of emergent literacy skills
 - The five essential skills of reading
 - Theories of learning, models of instruction, and their application in the design of appropriate reading and language arts

Our Requirements

- 20 students with pre-requisites
- Take the linked classes simultaneously
- Classes ran back-to-back
- Separate assignments with one exception
- Each instructor remains in the other's class

Partnership with a 4th grade

- Pen Pal project organized around mathematics problems
- Focus on both writing development and mathematical problem solving

Sample Problems

- Turkey Problem (from Young Mathematicians at Work)
- Lizards & Beetles (from Southwestern PA Math Science Partnership)

Getting Started

- Preservice teachers completed problems
- Brainstormed ideas
- Decided on hints/ strategies
- Letter writing

Examining Student Work

- Math
 - Strategies
 - Explanations
 - Level of Understanding
 - Providing Feedback
- Reading
 - Comprehension
 - Vocabulary
 - Spelling
 - Writing

Learning Community

- Benefits:
 - improved learning through grades
 - increase participation in collaborative projects
 - more active learning in classes that focus on higher level thinking skills (Zhao & Ku, 2004).

Reactions of Pre-Service Teachers

“Showing us that combining math & literacy is allowed makes the idea of teaching math less scary.”

“Helps make the connections between two previously viewed polar opposite subjects that have a lot in common.”

“In all of the methods classes, they talk about how helpful it is to integrate literature into various subjects. I think it is valuable to see them explicitly connected through these courses.”

Reactions

“I liked that they gave us the math problem that we were going to be asking the student to do...then, we were better able to direct the students. I thought that was a very nice link between reading and math.”



“Math has always been a stronger subject for me and I never liked reading, but after the course, I learned more in reading that I could apply in the future.”

“I feel more confident in math...what helped the most was using manipulatives and learning how to implement those to help me get my point across to students”



Looking back / Looking forward

Outcomes

- Informal observation by a colleague
- Developed a community of learners

Future Changes and Research

- More integration of language arts
- Will students continue to integrate during student teaching?