

## Mathematics Video Conference: NTID and CSB

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February 7/8, 2007

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## Focus Areas from CSB:

- Classroom Strategies
- Math Anxiety and Motivation
- Effective Evaluation and Assessment

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## Classroom Strategies

- Teaching Practices
  - We have many suggestions
  - But first, some research findings
    - Research will help us frame our suggestions
    - Research results may help you understand your students' difficulties are not unique

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## Research Findings

- Deaf students may not be skilled at:
  - Metacognition (thinking about thinking)
  - Monitoring their own understanding
  - Recognizing what they do not know
  - Understanding the whole instead of individual parts
  - Understanding the purpose of a task
  - Relating new material to existing knowledge

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## Research Findings

- Deaf students may not be skilled at:
  - Making inferences
  - Transferring and applying what they know
  - Sorting important from unimportant information: sketching difficulties
  - Knowing when to ask for help and what questions to ask
  - Reading and expressing ideas in writing

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## Classroom Strategies

- In spite of research findings, we are optimistic
  - We take satisfaction in moving students along mathematically
  - We will share some of the more successful strategies used in our classes.

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## What We Value and Encourage (Target Values)

- Problem solving, reasoning, divergent thinking
- Technology, calculators, reasonableness of results
- Models, diagrams, sketching
- Symbol use and meaning
- Lab activities and reports
- Language and communication
- Study skills and use of a text
- Positive attitude toward learning, including persistence.

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## Strategy #1: Emphasize and Practice Language

- Reinforce the language of instruction since it may not be the student's first language
- Make connections between the language of mathematics, sign language and the language used in your academic setting
- Discuss vocabulary
  - Math vocabulary including variations
  - Everyday vocabulary in a mathematical context
  - Non-technical vocabulary
- Key words? Be careful!

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## Strategy #1: Emphasize and Practice Language (cont.)

- Use questions to summarize. Encourage sentences and details.
  - What did we study yesterday (or today)?
  - Which homework problem was difficult? Why was it difficult?
  - Why does the sign for (XXX) make sense?
  - How do you explain (XXX) to a friend?
  - What comparisons can be made between two given quantities?

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## Strategy # 2: Encourage Sketching

- Visuals should be part of student's mental resources
- Sketches give students a frame of reference and illustrate their thinking
- As instructors model sketching, students can see what is the essence of a problem
- Instructors' knowledge of visuals in previous courses can be used to make connections to new material.

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## Strategy # 3: Use Quality Materials

- Videotapes, WWW, and Text Books
  - Issues
    - Content
    - Pace
    - Mathematical accuracy
    - Language accessibility
    - Expense
- In-house materials
- Texts and supporting material
  - Learning to use a text: target value

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## Strategy # 4: Improving Retention of Knowledge, Skills

- Use a spiral approach
- Introduce new topics with a mention of what they learned previously
- Prod with clues when students 'forget'
- Keep spiraling positive--you will enjoy teaching more, too
- Calculators can help

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### Strategy #5: Tutoring

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### Math Anxiety and Motivation

- Use of a variety of assessment methods, not just tests
- Convey your satisfaction with student progress
- Address avoidance behaviors
- Use activities that you find interesting
- Use problems that are meaningful (from the technical programs)

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### Assessment and Evaluation Underlying Principles

- We strive to maintain standards without causing student failure
- We recognize that there is a thin line between enabling and preventing
- We know that most of our students do not pursue careers in mathematics

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## Assessment and Evaluation

- Our assessment of student work reflects established standards of mathematics education in the USA
  - Tests, quizzes
  - Lab reports
  - Group work
  - Presentations
  - Homework assignments

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## Assessment and Evaluation

- Assessment of student learning can be difficult because of language factors
  - Students may not be able to communicate all they know
  - Students may not read well
  - We might assume students know more (or less) than they really do

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## Mathematics Placement

- Use of selected questions to target the 'heart' of a course
- Use results to place in a course where student can be successful and challenged
- Percents used for placement may seem low or arbitrary
- Student interviews can help in placement, as can academic record
- "But I already had algebra."

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