Alternative Ways to Use the Same Video

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In teacher professional development or with pre service teachers, videos can be used in alternative ways. The use is shaped by pre viewing, during viewing, and post viewing activities. Also, the same video or video segments can be viewed more than once, through alternative lenses.

The PBS MATHLINE Preservice Initiative Project was conducted in 1999-00 among faculty who prepare K-12 mathematics teachers on different campuses in five states. In the project, Mathline videos were used to examine the emerging meaning of Algebraic Thinking and how teachers at different levels-elementary, middle and high school, incorporate algebraic thinking in their classrooms. The videos used spanned the K-12 grades and were part of the four different Mathline projects. (For a complete report see http://www.ecb.org/wecbonline/nprime).

Teacher Beliefs About Algebraic Thinking Strategies

Too many preservice teachers (as well as inservice teachers) have neither observed nor experienced algebraic thinking strategies. They may not even have the vocabulary to identify and describe the various strategies. The Mathline video examples challenged their current beliefs about algebra, how to teach algebra, and the algebraic thinking capacities of elementary students.

The mathematics faculty who worked to review the Preservice Mathematics Initiative materials recommended that the videos could be used to examine various algebraic thinking strategies identified by M. Driscoll (1999).

Looking for regularities, patterns and connections
Generalizing
Doing and Undoing
Working forwards and backwards
Computing with computing (abstracting from computation)
Asking questions about "always," about nth terms
Building rules for describing functional relationships and patterns

The faculty who used the videos reported that the mathematical problems in the videos are more complex than the typical problems posed to elementary and middle grade

students. Preservice teachers were surprised at the correct and in-depth use of mathematical terminology and thinking by elementary students.

The videos also challenged more general beliefs about teaching and learning mathematics. The videos show classrooms in which students expect that problems can have multiple solutions and multiple solution strategies. Many preservice teachers had only experienced mathematics and algebra courses where there was only one correct answer and only one correct way to solve a problem. They were **not** experienced with the algebraic thinking strategies listed above.

Using the You Make the Call Video Lesson with Preservice Teachers

You Make the Call is a video took place in a Seventh Grade Classroom. The stated Lesson Objective was: Determining the function rules in two sets of data and compare the results to solve a problem. Here is how the video was used with preservice teachers.

- Before video viewing activities:

    1. In an earlier class preservice teachers had seen the ATMP video: *What is Algebraic Thinking?* Students had developed their understanding for the concept: Teaching Algebraic Thinking? Before showing the *You Make the Call* video there was a review of the key components of Algebraic Thinking as shared and discussed in the earlier class.

    2. Copies of the two Phone Call plans were distributed and preservice teachers are ask to think about what they saw in the first plan; and then share with one other person.

- Viewing Activities:

    1. The first seven minutes of the video (0.00-7:10) were shown. Preservice students compared what they had said to describe the plan with what the seventh graders said about the plan on the video.

    2. The question is posed: What elements of algebraic thinking were in students' description of the 1st Phone plan.

    3. Preservice teachers are asked to think about what they see in the second phone plan and then share with one the other person.

    4. They then watch the video to 11:50 in which the students are examining the second phone plan. Again the preservice students discuss the comparison between what they had said to describe the second plan with what the seventh graders said about the plan on the video. Again they discuss the question: What

elements of algebraic thinking were in students' description of the second phone plan?

5. Copies of the Driscoll elements of Algebraic Thinking are distributed. Students again view the first 11 minutes of this video and as they do so they identify examples of Driscoll's different elements. Students are assigned a short paper on their understanding of the concept Algebraic Thinking.

· Post viewing

Later in the semester, when focusing on geometry, another ATMP video is used.

1. Students are asked to think about and share their ideas on the question: What elements of Algebraic Thinking can begin to be introduced at the elementary level?

2. *Looking Through the Algebraic Lens, Part I1* is shown and again there is a discussion on whether or not algebraic thinking can be introduced in 3rd grade and through the geometry lesson shown in the video.

Reference:

Driscoll, M., (1999). Fostering Algebraic Thinking: A Guide for Teachers Grades 6-10. Heinemann. Portsmouth NH.

You Make the Call and *Looking Through the Algebraic Lens* videos and lesson guides in the Mathline grades 3-8 project called the Algebraic Thinking Math Project. (See www.pbs.org/teachers Mathline Algebraic Thinking Math Project (ATMP) lesson plans.)

Wilsman, M., (2000). PBS Mathline Preservice Initiative Project. Wisconsin Educational Communications Board. Madison WI.

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