3. Researcher's Comments (English)

00:00:12 The lesson begins with a non-problem segment -- a mathematical discussion outside the context of a problem. Here the teacher reviews what the students did previously and then tells them what they will work on today (i.e., finding the perimeter of a circle). This is an example of a non-problem segment containing both mathematical and contextual information. It also includes a goal statement.

On average in the Czech data set, non-problem segments accounted for 15% of the total lesson time (Hiebert et al., 2003, *Teaching Mathematics in Seven Countries: Results from the TIMSS 1999 Video Study* [hereafter Video Report], figure 3.3). Of these non-problem segments, 54% contained mathematical information and 63% contained contextual information (Video Report, table 5.5). Goal statements were made in 91% of Czech lessons (Video Report, figure 3.12).

This portion of the lesson is a review focused on how to calculate the perimeter of other geometric shapes. It leads into the presentation of new content, which begins at 4:37. Later (at 26:44) the students practice what they have newly learned by solving problems that involve calculating the circumference of various circles. In this lesson, approximately 10% of the time is spent reviewing, 50% on introducing new content, and 40% on practicing the new content.

Compared to this lesson, Czech teachers typically spent more time reviewing and less time on new material. In the Czech data set, on average, 58% of the lesson time was devoted to review, 22% was devoted to introducing new content, and 20% was devoted to practicing new content (Video Report, figure 3.8).

00:04:37 Here the teacher poses the first problem in the lesson: Find the perimeter of a circle. This turns out to be a derivation of the formula for the perimeter, and takes about 22 minutes to complete.

Problems coded as proofs, verifications, or derivations were quite rare in the Czech data set. Five percent of the lessons contained one or more problems of this type (Video Report, figure 4.4). This problem is also considerably longer than most. On average, independent problems in Czech lessons lasted four minutes (Video Report, figure 3.5).

00:17:38 The initial statement of this problem (at 4:37) asked for the perimeter of a circle. In other words, the teacher was looking for a general mathematical formula, not for the perimeter (or circumference) of a particular circle. This would be coded as a "stating concepts" problem statement. As the class works through the problem, they draw upon geometric reasoning, in general cases, in order to conclude why the formula exists. Thus, the implementation would be coded as "making connections."

Problems of this nature were fairly atypical in the Czech Republic sample. On average,

seven percent of the problems in a lesson had a "stating concepts" problem statement (Video Report, figure 5.8). Of these, 13% had a "making connections" implementation (Video Report, figure 5.11).

00:26:44 The students are provided with the opportunity to use calculators to solve these problems. Use of computational calculators was seen in 31% of the lessons in the Czech data set (Video Report, figure 5.18).

00:28:30 The interaction pattern shifts now from whole class interaction to a student working at the board while others work at their seats. Altogether there are four interaction pattern shifts, as the lesson moves back and forth between these two patterns. This number of shifts is less than the Czech average of seven per lesson (Video Report, table 3.7).

00:37:50 Here the teacher assigns a second set of concurrent problems (the first set was assigned at 26:44). Altogether students spend approximately 49% of the lesson time working on one independent problem, and 39% of the time working on nine concurrent problems. The remainder is devoted to non-problem segments.

These proportions are similar to those found for the entire Czech data set. On average, Czech teachers devoted 52% of the lesson time to independent problems, and 31% to concurrent problems (Video Report, figure 3.4). However, on average, 13 independent problems were worked on per lesson (Video Report, table 3.3).

Students solved all but two of the concurrent problems on the blackboard. This proportion, 78%, is similar to that in the Czech data set where, on average, the solutions to 76% of the concurrent problems were presented publicly (Video Report, figure 5.7).