

INTRODUCTORY LESSONS ON ALGEBRA: A VIDEO STUDY (VIDEOMAT)

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The introduction of algebra has been defined in the scope of this project as the introduction of letters as variables. The primary aim of the project is to document, through video recordings, mathematics teaching and learning in Norway, Finland, Sweden, and USA (California) in relation to the introduction of algebra, and to make a comparative analysis among the lessons. A second aim is to use the collected data to stimulate the dialogue and professional development among teachers of the four countries through the analyses of their own practices and those of fellow teachers. A virtual platform will be created in order to invite teacher's discussions. We believe that this project will uncover aspects of teaching and learning not seen in separate studies in each country.

RESEARCH QUESTIONS

The following general questions will be addressed in this project:

1. Which teaching approaches' to algebra are used and how are the lessons organized in these four countries?
2. How are the main components of an algebra lesson structured, implemented and discussed by the teachers?

THEORETICAL BACKGROUND

The VIDEOMAT project is positioned within the frame of social-cultural research (Säljö, 2000, 2006). In this approach, many concepts are used as analytical tools to make explicit the learning process in the classrooms, such as *mediation* (Carlsen, 2008) and *dialogue* (Bjuland, Cestari, & Borgersen, 2008). The analytical interests of the VIDEOMAT project is towards seeking similarities and differences in how algebra are introduced in the mathematical classroom, and discussed as well as analysed among teachers.

RESEARCH METHODS

Participants in the project are teachers and students. There are four or five teachers in each country from two to five schools. The specific grade level when the formal introduction of algebra takes place was not well defined in the curriculum from any of the countries. The research group decided to determine this introduction through textbook analysis. In Norway data was collected in grade 7 and 8, where the students are 12 and 13 years of age, in Sweden and Finland in grade 6 and 7 where the students are of the same age. In USA the data is collected from grade 6 and 7 and here the students are one year younger, respectively 11 and 12 years.

Five consecutive lessons with each participating teacher are video-recorded. The timing of the video-recorded lessons is decided together with each teacher, and is related to the introduction of algebra. During the four first recorded lessons, the class follows the ordinary curriculum. During the fifth lesson all classes work with 3 problems adapted from the TIMSS 2007 to get a compatible material. Interviews are conducted after the fifth lesson with the teachers and comments are given by them at the end of each recorded lesson. Students' written work and teachers' lesson files (lesson plans, tasks, textbook, etc.) are collected as well.

Following an agreement between participating countries to obtain comparable materials, the first lesson from each teacher and the interview are transcribed. To make collaborative and comparative analysis possible we have structured and organized a databank. The large sets of video data (60-70 hours from each country) are codified. A coding procedure has been developed from the first video data collected in the project (Swedish data). The coding procedure is influenced by the manual for the 1999 TIMSS Video Study (Jacobs et al., 2003). The structuring of data has three different features: coverage codes, lesson graphs and key words. Coverage codes serve the purpose of describing types of activity and interaction, lesson graphs give an overview of each lesson as a whole, and keywords highlight where and when specific aspects of algebraic content is treated.

At the moment we are in the process of completing data collection from the classrooms, and we will start to analyse these related to the first research question. We are also about to enter a new phase of the VIDEOMAT project which aims at stimulating dialogue and professional development among teachers. This will be done through a virtual platform where and when a collaborative analysis of their own practices will be established. This is related to the second research question.

PLAN FOR PRESENTATION OF THE CONTENT ON THE POSTER

We plan to design a poster presenting the content outlined above. We will also include references to relevant literature, pictures from the classrooms, lesson graphs, examples of tasks and contact information.

REFERENCES

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