Finnish Mathematics Textbooks in Grades 5-7

Recent studies have shown that to a very large extent, in comprehensive school Finnish teachers base their mathematics teaching on textbooks. Despite this, there has been little research on textbooks. The aim of this study was to examine the mathematical contents of Finnish mathematics textbooks for Grades 5-7. The study is based on the theoretical framework of the TIMSS studies (Third International Mathematics and Science Study), where the curriculum was considered to play a central role in education. The TIMSS framework curriculum has three levels: the intended, the implemented and the attained curriculum. Briefly, the intended curriculum consists of the objectives and contents of mathematics teaching defined at the system level, while the implemented curriculum refers to the mathematics taught in classrooms and the attained curriculum to the outcomes of schooling. In this model, textbooks are located between the intended and the implemented curriculum levels and are termed the potentially implemented curriculum.

Three mathematics textbooks used most often in each grade level were analysed, adopting the method of curriculum analysis applied in the TIMSS 1995 study. The textbooks were described from three viewpoints: the mathematical content, performance expectations, and perspectives used in the TIMSS 1995 mathematics frameworks. The main steps in the analytical procedure involved dividing the textbooks into blocks and then giving the blocks one or more codes describing their content and associated performance expectations.

In Grades 5 and 6, most of the textbook space was devoted to basic number concepts and their operations: whole numbers, fractions, decimal numbers, and in Grade 6, also percentages. Measurement was often discussed in connection with other subjects, especially decimal numbers. The differences between the content profiles of the textbooks used in Grades 5 and 6 were small. In Grade 7 the amount of textbook space devoted to the above number concepts was distinctly smaller, and as a new content integers were presented. Two-dimensional geometry dealing with polygons and circles was a shared content area emphasised in all seventh-grade textbooks. The content areas covered in them varied a great deal. The best example of this variation was equation-related mathematics, which accounted for about 25 per cent of the
contents of one of the textbooks, while in the others it accounted for less than 5 per cent of the contents. The effect of the change from the spiral approach to course-based teaching in Grade 7 is easily discernible in the results. The variation in the contents covered increases considerably in this grade. Whether this causes variation in the learning outcomes is one of the questions that will be examined on the basis of the Finnish TIMSS 1999 results. A recent study found differences in learning outcomes among different textbook users in Grade 6. Could these be caused by the different approaches of the textbooks in question? Altogether, the study gives a good overall picture of the Finnish mathematics textbooks used in Grades 5-7, but at the same time it raises a great many questions for future studies.