



Instruments for measuring teaching quality in Mathematics

Example approaches in Icelandic research

Abstract

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HÁSKÓLI ÍSLANDS

Abstract

This paper explores the views of teachers in upper secondary schools on creative and demanding mathematical tasks and whether they found that students in remedial courses had improved their mathematical competency with such tasks. Five participants, teaching remedial courses in mathematics from three upper secondary schools were interviewed. The interviews were conducted both before and after the teachers assigned tasks to their students where the solution required both critical and creative thinking. Course syllabuses were also analyzed.

Various tools have been developed to analyze different types of student activity and student understanding in mathematics. The emphasis in mathematics teaching can be placed on either relational understanding or instrumental understanding (Skemp, 1976; Hiebert & Carpenter, 1992). A framework for analyzing whether solving mathematical tasks requires relational understanding has been widely used in mathematics education research (Stein, Smith, Henningsen & Silver, 2009). Some scholars suggest that teacher competency is critical in implementing tasks in which a solution requires higher order thinking such that teachers encourage and promote students thinking (Henningsen & Stein, 1997; Stigler & Hiebert, 1999; Kilpatrick, Swafford & Findell, 2001; Niss & Jensen, 2002).

The findings showed that teachers generally considered students in remedial courses to have the necessary skills to be able to learn from working on such tasks. Many mentioned the importance of task diversity. Suggestions were made about how learning materials of this nature could be weaved together with less demanding tasks, but more research is needed concerning the most suitable order of different types of tasks (Rittle-Johnson, Schneider & Star, 2015; Pesek & Kirshner, 2000). QUINT research can shed some light on the “how” and whether different types of instruction can have different effects regardless of how much analytical thinking the students are required to do to solve a task.