



UMEÅ UNIVERSITET

Att räkna med alla elever Följa och främja matematiklärande i förskoleklass

Helena Vennberg

Akademisk avhandling

som med vederbörligt tillstånd av Rektor vid Umeå universitet för
avläggande av filosofie doktorsexamen framläggs till offentligt
försvar i Aula Anatomica, Biologihuset (Bio.A.206)

fredagen den 3 april, kl. 10:00.

Avhandlingen kommer att försvaras på svenska.

Fakultetsopponent: docent Jorryt van Bommel
Karlstads Universitet, Karlstad, Sverige.

Institutionen för naturvetenskapernas och matematikens didaktik

Organization

Umeå University
Department of Science
and Mathematics Education

Document type

Doctoral thesis

Date of publication

13 mars 2020

Author

Helena Vennberg

Title

When all students count - Tracking and promoting mathematics learning in preschool-class

Abstract

The Swedish preschool-class is a unique type of schooling between preschool and school, intended as a bridge between two cultures, where development and learning have different meanings. The aim of this thesis is to contribute to the knowledge of preschool-class teachers' opportunities to track and promote the development and learning of all students in mathematics. The thesis consists of four studies. Study I was a controlled intervention. The intervention consisted of the teaching material *Think, reason and count in preschool-class* (TRC) and an auxiliary professional development programme. Both the TRC group and the control group were followed by observations and evaluated by pre- and post-tests. Two follow-up studies were carried out. Study II investigated the effect of TRC on mathematics development in the short and long term. Study III looked further into differences in results on the subtests of the national test in grade 3. Study IV examined how the student, mathematics and assessment are fabricated in policy documents regarding the imposition of the assessment material for preschool-class, *Find the mathematics* (FM). Together, Study I, II and IV answer how support and teaching materials shape preschool-class teachers' ideas and abilities regarding mathematics, assessment and students at risk of mathematical difficulties. Study I, II and III answer how TRC affects the mathematical development of students who are at risk of mathematics difficulties (at-risk-students) in the short and long term.

The results show that, with TRC, the preschool-class teachers' ability to track the knowledge development of at-risk-students increased with awareness of the teachers' own subject knowledge, despite the fact that assessment was a peripheral aspect of TRC. The results show that, with TRC, assessment became a naturally integrated process in teaching, where preschool-class teachers identified difficult content and obstacles in learning mathematical content rather than identifying students. In contrast, the results show that in FM, assessment opportunities are presented as defined, planned activities where the goal is to check students' knowledge. In FM, assessment is fabricated as a need to capture the student's inner beliefs, thinking and shortcomings. In addition, the results show that students' mathematical development was greater in the TRC group than in the control group, especially for at-risk-students. This indicates that inclusive mathematics teaching with a focus on reasoning about representations of numbers provides opportunities to develop good numeracy for all students and is particularly supportive to at-risk-students. The results show a positive effect for at-risk-students, and perhaps just as important: no indication that TRC hamper students who are not at-risk-students.

Keywords

Preschool-class, assessment, mathematics, at-risk-student, intervention

Language

Swedish

ISBN

978-91-7855-230-6

ISSN

1650-8858

Number of pages

75 + 4 papers