

Institutionen för didaktik och pedagogisk profession

Students' and Teachers' Jointly Constituted Learning Opportunities

The Case of Linear Equations

av

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Abstract

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This study emphasises jointly constituted learning opportunities in mathematics instruction by analysing learner contributions, and the attention paid to them, in whole-class teaching. Interaction in mathematics classrooms has been a significant research area for decades and the importance of using a learner perspective in teaching is well recognized. However, few studies have investigated interaction in relation to the opportunities for learning the content of the lesson. The aim of this study is to gain deeper knowledge about the relationship between interaction and the learning opportunities that emerge. Enacted dimensions of variation (e.g. Marton, 2015), the aspects of the content that are made possible to learn, are used as unit of analysis throughout the investigation. Learner contributions are regarded as all the public, content-related utterances from learners in a lesson. This study encompasses 14 video-recorded mathematics lessons, from either grade 9 in compulsory school or from grade 10 or 11 in upper-secondary school in Sweden (ages 15 – 18). All lessons had the same topic, the introduction of linear equations, in order to make learning opportunities comparable. 12 teachers and 14 classes (297 learners) participated. Learner contributions were developed in four different trajectories in the lessons. Depending mainly on different attentions from teachers, the learner contributions were disregarded, selected, considered, or explored. Based on this categorisation, the lessons were grouped into three main types. The learning opportunities from a content perspective were thoroughly investigated. Results show that different learning opportunities for concepts like function and slope emerged in different lesson types. In addition, learners and teachers were shown to generate different kinds of aspects of the content taught. Necessary aspects of linear function, like the separation of b-values as y-intercepts or the fusion of slopes and y-intercepts to the equation of a straight line, were mainly generated by teachers, even though often enacted together with learners. Optional aspects, like the separation of function from a single point or from 'a line between intercepts' were, on the other hand, mainly generated by learners. The optional aspects were, however, greatly dependent on teacher exploration for their enactment. The main conclusion drawn is that the importance of using a learner perspective in instruction also relates to the quality of the learning opportunities that emerge. The enactment of optional aspects of linear equations was greatly dependent on learner contributions but also on teacher exploration. Contrary to what might have been expected, the necessary aspects of linear equations were also enacted in more qualitative ways in lessons in which learner contributions were frequently explored. There seems to be a price for learner silence in instruction. And, furthermore, this price is not only constituted by learners; it also depends on teacher attentions to learner contributions.