

NO WAY THAT'S TWO HUNDRED AND FIFTY INCHES DEEP! MATHEMATICAL UNDERSTANDING IN AN APPRENTICESHIP CLASSROOM

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The larger study from which this poster comes is concerned with exploring how adults in workplace training learn, understand and use mathematics as they engage with it in the context of their specific trade.¹ This poster will focus on the growing mathematical understanding of three apprentices, known here as Joe, Andy and Mike, who are in the second year of an apprenticeship training program to become credentialed ironworkers. The taught program is based at an Institute of Technology in Vancouver, BC, and involves classroom and practical sessions. The apprentices were in a larger class of about twenty students and Joe, Andy and Mike worked closely together, for about one hour, at a desk, where they were video and audio recorded. In this session they have been posed the task of establishing the size of choker sling required to lift an assembled structure of four large iron beams into an upright position, and later of determining where the crane should be positioned to accomplish this. The structure consists of two upright beams, one top crosspiece, and one middle beam. This is lifted into position using two chokers in a sling arrangement around the top beam. It is the size of these chokers that the apprentices have been asked to calculate, something that is dependant on the total weight of the structure to be lifted. In analysing the data, and in seeking to describe and account for the way in which the students work mathematically whilst solving this problem, we employed elements of the Pirie-Kieren Theory for the Dynamical Growth of Mathematical Understanding (Pirie & Kieren, 1994). However, we also characterise mathematical thinking as particularly complex in the workplace, involving the drawing on and working with three different forms of mathematical understandings: understandings of the task as posed; understandings of the mathematical relations required by the task; and understandings of the task as an actual job to carry out. We contend that it is the way that these apprentices are able to build an understanding that shifts, and builds connections, across these three dimensions, that leads to their success with the task.

Endnote

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References

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