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TEACHING PICTURE GRAPHS: MATHEMATICS-PEDAGOGICAL-CONTENT KNOWLEDGE-IN-ACTION

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A teacher cannot hope to explain mathematical concept if she does not have full understanding of that mathematical concept. Nevertheless, case study evidence suggests that the influence of teachers' mathematics pedagogical content knowledge (MPCK) has a strong influence on children's learning outcomes (Shulman, 1986). In the teaching of mathematics, Ball (2000) stressed how the depth of teachers' understanding of MPCK is a major determinant of teachers' choice of examples, explanations, exercises, items, and reactions to children's work. In light of interpretation of picture graphs and mindful of the challenges inherent in teaching them, it seems timely to look at how a beginning teacher apply her content knowledge and pedagogical content knowledge in teaching picture graphs. The purpose of this presentation is to determine what the researcher term "MPCK-in-action" outcomes as observed being practised by teachers when teaching mathematics and to ascertain the relative importance of different practices in contributing towards effective pupil learning. This presentation uses data from a larger study and focuses on investigating MPCK-in-actions within the context of a primary one mathematics classroom by exploring the following research question: What are the observable MPCK-in-actions that are present in the teaching of picture graphs? The framework for analysing MPCK-in-action practices developed by Lim-Teo and her colleagues (Lim-Teo, Chua, & Yeo, 2011) gives a detailed inventory describing evidence for identifying key components of MPCK-in-action practices within ten categories. The results depict the challenges associated with teaching of picture graphs and the interpretation of the picture graphs as well as the importance of content knowledge and pedagogical content knowledge. The beginning teacher's MPCK was evident not just in the choice of activities, but in the ways that she was able to link concepts to pupils' experience. The teacher's approaches varied, giving pupils greater freedom to think about representing picture graphs and holding rich discussions with groups and individuals.

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