Impact of collaborative planning for mathematics and anticipating student responses to problems on teacher beliefs, knowledge and practice

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Jenna Louise Crowley

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ABSTRACT

Six teachers engaged in collaborative planning for mathematics lessons that allowed for student-generated responses to problems. As part of their planning they anticipated a range of possible strategies students could use to solve problems and possible student misconceptions. This study explored how the teachers perceived these practices affected their beliefs and the teaching approaches they enacted in their lessons. The study also examined the affordances and barriers of collaborative planning and anticipating on teacher learning.

Mathematics education literature recommends a move toward student inquiry approaches in order to improve outcomes for all learners. Relevant literature was reviewed, illustrating the importance of providing the conditions required to enable teacher learning and change. Evidence was provided of the role of dissonance, teacher confidence and knowledge of both mathematics content and pedagogy, and effective leadership and systems of support. Teacher collaboration was identified as a potential catalyst for change.

A qualitative case study method was chosen as most appropriate for this study. A range of data was collected and analysed, including semi-structured interviews with all of the participants. Researcher field notes and documentary data allowed for triangulation. Ethical principals were strictly adhered to.

The study revealed some resistance to change and the constraints of teachers' prior learning and existing beliefs and practices on the outcomes of the collaborative planning intervention. The study demonstrated teachers' experimental approach to enacting new practices in mathematics lessons and their adherence to their current teaching practices and beliefs about grouping students for learning. Noteworthy benefits of anticipating and collaborative planning were increased teacher confidence to allow student-generated solutions to problems and increased teacher knowledge of mathematics strategies. These benefits were attributed to teachers learning from each other while collaboratively planning.

The results revealed teacher collaboration was perceived as an affordance to change and highlighted a number of factors which acted as barriers to teacher change. Identified barriers included either too much or too little dissonance experienced by teachers, attitudes towards risk and the desire to conform, and gaps in teacher knowledge of mathematics. The results offered insights into the effects of school culture and the design of professional learning experiences for teachers.

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