INVESTIGATING THE MATHEMATICS TEACHING EFFICACY BELIEFS OF STUDENT TEACHERS

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Introduction: Beliefs about self-efficacy are highly connected to student-teachers’ willingness to learn, and to adopt progressive teaching methodologies (Zimmerman, 1999; Enochs et al., 2000; Swars, Smith, Smith, & Hart, 2009). As teacher-educators, we endeavour to optimise our teaching so as to support the development of positive efficacy beliefs among our students. This research study seeks to explore the Mathematics Teaching Efficacy Beliefs of student teachers at primary level as part of a longitudinal design-research study, whereby research findings will guide planning for future modules.

Methodology

The Mathematics Teaching Efficacy Beliefs Instrument (MTEBI) of Enochs, Smith, and Haniker (2000) was employed to measure the overall efficacy beliefs of teachers, and also the beliefs within two subscales, the Personal Teacher Efficacy, and Teaching Outcome Expectancy. A convenience sample of 40 undergraduate students participated in a questionnaire based upon the MTEBI with additional questions relating specifically to the context of a Mathematics Education module recently completed by the students. The sample was drawn from a year group of 440 students by invitation.

The cohort of 440 students was also invited to attend semi-structured focus group interviews. In total, three focus-group interviews, each with 5-6 participants, took place. The interview schedule was based on an adapted interview protocol by Swars (2005) and included questions related to issues arising from the MTEBI analysis as well as students’ experiences of teaching mathematics on School Placement and their perceptions of the research module. Nvivo was used to facilitate the thematic analysis (Braun & Clarke, 2006) of transcripts.

Results

The MTEBI questionnaire consists of two independent subscales, the Personal Mathematics Teaching Efficacy (PMTE) subscale and the Mathematics Teaching Outcome Expectancy (MTOE) subscale. Each item has five possible responses on a Likert Scale ranging from strongly agree to strongly disagree.

Results indicate that average students’ self-efficacy scores hover around the midpoint of the Likert scale with no significant relationship found. The average score on the MTOE scale is 3.20 out of 4, indicating that students have a strong belief in the efficacy of their teaching. This is also the case for the PMTE scale. There is a positive correlation between mathematics teaching efficacy and student achievement in student teachers’ mathematics education. However, when asked about mathematics teaching efficacy, there is a difficulty understanding mathematics teaching for the future teachers (Figure 1).

Scores indicate that average students’ self-efficacy scores hover around the midpoint of the Likert scale. The MTOE scale has a range from 1 to 4, indicating that teachers have a strong belief in the efficacy of their teaching. This is also the case for the PMTE scale. There is a positive correlation between mathematics teaching efficacy and student achievement in student teachers’ mathematics education. However, when asked about mathematics teaching efficacy, there is a difficulty understanding mathematics teaching for the future teachers (Figure 1).

Conclusion: The research presented in this poster aims to unpick the ways in which our teacher education modules could and currently do support the development of positive efficacy beliefs in our students. We have highlighted one aspect of the students’ efficacy beliefs in terms of their sense of their proficiency in the use of concrete materials and their understanding of the role that concrete manipulatives could play. While student expressed a consistent sense that concrete materials are “useful”, and indicated an understanding that they were expected to use concrete materials, uncertainty persists about their proficiency to use them in meaningful ways, and to manage the classroom logistics and availability.

References:


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