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The Changing 'Beliefs' Of Pre-ITE Students Concerning How Mathematics Should Be Taught

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Background

Concerns about the recruitment and retention of secondary school mathematics teachers in England, the provision made for student teacher learning on pre-service, or Initial Teacher Education (ITE) courses, and the quality of mathematics teaching in schools date back to at least the Cockcroft Report (1982). A recent Ofsted report 'confirmed the narrow nature of much of the teaching' (Ofsted 2008, 5), while an earlier report had, as one of its main conclusions, that the 'quality of teaching was the key factor influencing students' achievement' (Ofsted 2006, 1). The Training and Development Agency (TDA), which regulates pre-service courses, their numbers and training quality, initiated Mathematics Enhancement Courses (MECs) in 2004, to help address these issues. A MEC is a 26 week mathematics subject knowledge for teaching course undertaken by graduates who do not possess a mathematics degree, but who wish to teach mathematics at secondary level (aged 11 and over). A MEC is a step on the road to mathematics subject knowledge, understanding and performance, which is completed before commencing ITE.

Enhancement Courses and the ITE pre-learning which take place in them, as part of becoming a teacher, are an under-researched area. Yet Enhancement Courses are very important in today's ITE landscape in England, as well as in other countries, including the USA and South Africa.

Research Questions

The research question to be answered by my paper is: Does participation in a pre-Initial Teacher Education (ITE) Mathematics Enhancement Course (MEC) - and hence exposure to a variety of teaching approaches - change the 'beliefs' of pre-ITE students concerning the way in which they think mathematics should be taught?

Methods

Following a pilot study (Clarke, 2009), the paper will draw on a mixed research design consisting of a mixed methods study of the 2010 cohort of MEC students. The quantitative aspect will include a questionnaire, refined after the pilot, and the 'belief statements' used to form the questions in it will be based upon statements previously used by Swann (2005; 2006) and the Standards Unit (2005). The questionnaire includes information on the biographies, schooling and Higher Education of the participants. The qualitative data will be collected through guided/semi-structured interviews with a representative sample of students aiming to explore if, how and why their beliefs changed during the MEC. Findings from both parts of the study will be analysed using both descriptive statistics and grounded theory to identify insights into the relationships for trainee mathematics teachers between personal learning, constructions of mathematics as a subject and developing pedagogical knowledge.

Frame

In their recent paper on the relationship between mathematical knowledge for teaching and the mathematical quality of instruction, Hill et al (2008) indicated that teachers' knowledge of the curriculum is a crucial construct. My paper will include an overview of the literature on teacher subject knowledge in mathematics teacher education, alongside definitions of teacher subject knowledge and pedagogical content knowledge. In addition, the influences of Shulman (1986) and Swann (2005; 2006) will be used to develop the conceptual framework for the research. This conceptual framework will be used to develop insights into the relationship for a trainee mathematics teacher between prior

experience of pedagogy as a learner, current experience of pre-ITE pedagogy, in a transition phase from learner to teacher, and future beliefs concerning their pedagogy as a teacher.

Research findings

Data analysis from the pilot study is still in the early stages, however initial evidence indicates that there are complex relationships between how students understand mathematics as a subject, their own experiences of learning the subject at school and in Higher Education, their constructions of what kind of mathematics teacher they wish to be and their experiences of learning on the MEC. The pilot study findings indicated that the 'apprenticeship of observation' (Lortie 1975, 63) which students have undergone through their own learning in schools may be a key factor. Identifying and discussing the patterns which these relationships indicate will be a focus of the work between January and September 2010. The paper will conclude with tentative recommendations for the future pedagogical approaches of MECs.

I presented findings from my pilot study (Clarke, 2009) to BERA at Manchester last year.

References

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