

“It’s not a sausage factory!” Primary teaching assistants’ experiences on a short intensive block of study on mathematics

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This paper reports on an initial study, which aimed to evaluate the learning experiences of teaching assistants studying a four week block on mathematics as part of an Open University module, *Subject knowledge and professional practice in primary schools*. This paper focuses on the design of the evaluation, and summarises some of the key findings to date and how they will inform the main study to follow. Findings from the initial study suggest that the impact of such a course of study on pupils’ learning and behaviour may be more extensive than TAs recognise.

Keywords: primary mathematics; teaching assistants; foundation degree study.

Introduction

Research (e.g. Henderson and Rodrigues 2008; Barmby, Bolden and Harries 2011) has identified that significant numbers of primary school teachers experience anxiety, lack of confidence or poor pedagogic understanding. My work on the Open University’s (OU) Foundation Degree for primary teaching assistants (TAs) suggests that these issues present themselves in a similar way amongst TAs, which has led me to deepen my interest in how to prepare primary TAs to support children’s mathematical learning effectively.

The focus of my doctoral study is TAs’ experiences studying a four week block on mathematics as part of an OU module, *Subject knowledge and professional practice in primary schools*. In particular, how does their learning impact on their support of children’s learning in school, and on their wider experience at home and in their community? Prior to starting the block, TAs carry out a formative ‘Maths audit’ to identify strengths and areas for development in relation to supporting learning in the primary classroom. During the block, they review their responses to the audit and, at certain points, decide which parts of a mathematical topic to focus on. In each week of the block they undertake online readings and interactive activities, and read at least one chapter from the module reader (Haylock, 2010). TAs participate in a module-wide discussion forum as well as smaller ‘tutor group forums’, in which they interact with and receive support from their tutor and immediate peer group. TAs complete an assessed ‘workbook’ that requires them to carry out or observe four activities with children in school, selected from a list of ten mathematics topics, and to evaluate each activity, making reference to the module materials.

This research adopts a socio-cultural perspective. For work-based learning this implies that differences will occur between contexts because individuals’ learning will be influenced by what they are able to do in the situations they find themselves in and the people they work with. For this initial study I wanted to test out the relevance of Lave and Wenger’s (1991) concept of ‘legitimate peripheral participation’ for TAs engaged in work-based learning. Lave and Wenger explain that they chose to describe what legitimate peripheral participation leads to as ‘full participation’ as opposed to ‘central’ or ‘complete’ participation to “do justice to the diversity of relations

involved in varying forms of community membership” (1991, p. 37). I wanted to explore what forms of ‘community membership’ might be achievable for teaching assistants as part of trying to identify effective ways of preparing them to support children’s mathematical learning effectively.

Joubert and Sutherland’s (2008) review of literature on continuing professional development (CPD) for teachers of mathematics has informed my research. The authors found the literature generally critical of attempts to evaluate CPD in mathematics, identifying a “lack of systematic and rigorous evaluation ... partly explained by the difficulty of finding suitable instruments or tools with which to conduct evaluation” (2008, p. 17). They also found that teachers’ practice appeared easier to investigate and was ‘measured’ more often than changes in pupils’ learning. Joubert and Sutherland concluded that investigating the impact of CPD on teachers’ knowledge and beliefs is difficult because of “the complexity of this knowledge, and because providing evidence of change requires information about the knowledge and beliefs of teachers both before and after their professional development” (2008, p. 17). I have therefore adopted the approach of an ‘illuminative evaluation’ for this research. Parlett and Hamilton describe this as an approach whose “primary concern is with description and interpretation rather than measurement and prediction” (1972, pp. 10-11) and whose aim is “to discover what it is like to be participating in the scheme” (1972, p. 11). The main data collection methods used in such an approach are observation and interviews, and, to a lesser extent, questionnaires and documentary sources. However, similarly to Ellis (2003), time constraints effectively preclude observation within my own study, for which I have consequently chosen a questionnaire and interviews as the means to gather data.

Questionnaire

A questionnaire comprising closed questions with a range of answers as well as open questions was used to give a broad picture of TAs’ study and the application of their learning. Quantitative data were analysed descriptively to give an overview of frequencies, and qualitative responses were analysed to identify key themes. Some key findings were as follows.

A large majority of respondents agreed or strongly agreed that following the block they felt more confident in their own mathematical ability (89.9%), and 84.4% stated that their study had led to them feeling more positive about mathematics generally. An even larger majority (96.3%) reported increased confidence in their ability to support children’s mathematical learning. Less positive was that 17.5% of respondents felt they had not become more confident to make suggestions about mathematical activities and approaches to the class teacher following their study.

Responses evaluating individual activities within the block suggested that how these contributed, either positively or negatively, varied considerably between TAs. Nevertheless some activities were rated much more positively than others. In particular 97.2% of respondents stated that the module reader (Haylock, 2010) contributed a lot or quite a lot to a successful learning experience, with a much higher percentage citing ‘a lot’ than for any other activity. 91.8% of TAs responded positively to the classroom-based workbook activities. TAs’ responses about the block’s influence on their classroom practice were comparably positive to those on their confidence in and attitude towards mathematics.

Only 28 TAs responded to the open question “please describe any changes in pupils’ behaviours, attitudes, attainment and learning that you have observed which

you consider to be a result of changes in your practice”. 14 of these responses did not directly describe any changes, although many nevertheless suggested a positive impact in terms of TAs’ practice. The remaining 14 responses were categorised according to four key themes: children’s increased engagement/enthusiasm/enjoyment (mentioned in 9 relevant responses); greater willingness to communicate (4) increased confidence/understanding (expressed in general terms) (2); increased confidence/understanding related to specific mathematical concepts or procedures (3).

50 relevant responses were given to the question “please identify and explain any factors that supported or inhibited your ability to transfer what you have learned during the block into your classroom practice”. Frequencies of ‘supportive’ and ‘inhibiting’ responses were almost the same. The most common supportive factor identified by respondents was increased understanding and/or confidence, accounting for half of the ‘supportive responses’. Supportive colleagues within the school were identified to a significant extent, although the class teacher specifically by just three respondents. Reflecting the quantitative data, the module reader (Haylock 2010), was identified by five TAs as a supportive factor.

One inhibiting factors stood out in particular: a lack of opportunity to input into the planning process. For example, one response was “As a TA I would love to put some ideas into the maths planning ... but this would not happen in my setting as planning is done by teaching staff”.

Interview

I invited four TAs, selected to represent contrasting experiences of the block, to take part in a semi-structured interview by telephone. In the event, only one of the four was available and willing to be interviewed. Tight time constraints and internal OU ethics procedures prevented the engagement of replacement interviewees. Although detrimental in terms of breadth, this situation allowed for an in-depth analysis of what emerged as very rich data from one interviewee.

I interviewed Emma (not her real name) two months after the end of the block using a schedule of questions based on the categories used by Harland and Kinder (1997) in their ‘ordering of INSET outcomes’ model. Emma was in her early 40s and working as a volunteer in a Year 4 class (ages 8-9) during the block, although her experience supporting children’s learning went back over three years, including time as a paid TA. She was studying the block as part of the OU’s Foundation Degree for primary TAs. Her ultimate aspiration is to teach. The following paragraphs summarise some key points from the interview.

Emma identified the module reader as the most influential resource from the block. Significantly, the book’s impact and effect on Emma’s professional identity as a knowledgeable supporter of children’s learning extended beyond the school context:

I work part-time in a bank as well ... the people I work with who’ve got children of primary school age who I’ve actually copied pages for ... so that they can use to work with their own children ... when they’ve come to me and said “do you know about chunking or do you know about bus stop method?” ... I’ve been able to say “actually yes I do, this is what it refers to, this is how you’d use it”.

Emma’s own experience as a learner of mathematics at school was that “the answer is either right or wrong”, a contributing factor in her previously negative feelings towards the subject. She perceived that a key message from the block was that “your own learning and how you felt about the experience at school yourself can

very easily influence how you then approach supporting children's learning and I identified with that ... [maths] didn't come particularly easily to me".

Identifying with this message appeared important to Emma, enabling her to engage with the notion of professional development as an ongoing process:

This block, it's not a sausage factory where you go in one end and you come out all singing and dancing and you can do everything. The idea is everybody is different who goes into it ... much better that you pick up on your own individual area of weakness, work on it and come out the other end and think "what an improvement I've made!" Yes there may still be other areas, there are still for me ... this is just the beginning ... it's a permanent cycle of learning.

Emma also stated that "for the first time I have felt able to participate in a discussion on maths within my community of practice at school and contribute something worthwhile". There seems an emotional dimension to this statement, a sense of personal breakthrough, especially in the context of her own negative experiences of maths as a learner at school. Linked to this affective outcome, Emma's motivation and determination to build on and share her learning were evident throughout the interview, exemplified by the tenacity she demonstrated in following up an initial discussion with her school's numeracy coordinator about introducing a new resource she had learnt about through her study.

In common with most respondents, Emma's questionnaire responses did not refer explicitly to changes in pupils' behaviours and learning. During the interview, however, she related a number of ways that she felt pupils' learning and behaviour had changed as a consequence of her study but recognised that these changes were not easily measurable. For example, she explained how her "newly acquired counting knowledge" had led to her discussing with the class teacher the aspects of counting she felt were problematic for a particular pupil, and that this resulted in her trying out new approaches that had impacted positively on his confidence and learning. Emma attributed reflecting on her "own personal historical fear of maths" to her encouraging pupils more readily to ask for help to overcome difficulties, and felt that this was another example of a positive impact on pupil learning and behaviour.

Discussion and looking forward

The questionnaire data indicated that most TAs experienced positive outcomes from their study of the block. However, echoing Joubert and Sutherland's (2008) review of the literature, evidence of changes in pupils' engagement and learning was harder to elicit. In some cases, the timing of the questionnaire may have been too soon for the positive outcomes for TAs to feed through to children's learning or behaviour. It is of note, however, that even for Emma, whose interview provided much evidence of a positive impact on children's learning and behaviour, this impact was not captured in her questionnaire responses; neither are the kinds of changes she described easily measurable.

Therefore my hypothesis is that impact on pupils' learning and behaviour may have been more extensive than revealed in the questionnaire data, but that because of the non-measurable nature of this impact in many cases – and therefore perhaps a lack of explicit value attached to it – it is often hidden, including to the TAs themselves. They are perhaps dismissive of their day-to-day achievements and require encouragement to recognise what is relevant in terms of change. Further interview data in the main study should help in this respect, especially to tease out examples of changes in pupil learning and behaviour brought about by TAs whose experiences in

the classroom were less positive than Emma's. For the main study I propose to use a much shorter questionnaire, more as a methodological device for identifying an appropriate range of interviewees, and to carry out a series of three progressive interviews with between six to ten TAs as my principal method of data collection. In-depth analysis of TAs' contributions to the online discussion forums may also provide an illuminative source of data in this respect.

The notion of an invisible, or imperceptible, impact is reinforced by the number of TAs who identified their own increased confidence as the main supportive factor in transferring their learning into classroom practice. Emma's interview provides a tantalising glimpse of the exact nature of this confidence and in which contexts TAs might feel able to enact it. In this respect, Houssart's (2011) findings about TAs reliance on experience and intuition merit further exploration.

The overwhelmingly positive response to the module reader was notable for two reasons. Firstly, it suggests that traditional textbook style print books still have an important role to play in the e-learning era. Secondly, Emma's interview suggests that the authoritativeness of the reader, both in its substantial subject knowledge content and title stating that it was written 'for primary *teachers*' (my emphasis) has led me to focus in greater depth on the 'legitimate peripherality' element of Lave and Wenger's construct: "As a place in which one moves towards more intensive participation, peripherality is an empowering position. As a place in which one is kept from participating more fully – often legitimately ... it is a disempowering position' (Lave and Wenger 1991, 36). In recent years a number of 'Handbooks for TAs' specifically relating to primary mathematics have been written. Whilst supportive of practice, that they are written 'for TAs' may be perceived by TAs as marginalising them and placing a limit on their potential participation. In Emma's case, her learning from the block and the module reader in particular appears to have enabled her to move towards more intensive participation. However, the questionnaire data suggests that not all of the TAs who responded benefitted from a similar level of opportunity to apply their learning that Emma experienced. For some, feeling that they have been unable to fully use their newly acquired knowledge and understanding in their practice may have added to their sense of their peripherality being disempowering. This may, in turn, have acted to conceal further from some TAs any impact that their study might have had on pupils' learning and behaviour. It is anticipated that the progressive interviews planned for the main study may enable TAs to identify and build on such impact.

Based on these reflections, the 'legitimate peripheral participation' literature still seems to have much to offer as a conceptual framework for this research. However, the data so far has steered me towards Fuller and Unwin's (2004) critique of Lave and Wenger's 'legitimate peripheral participation' as failing to "highlight the relevance of other forms of participation, such as boundary crossing between multiple communities of practice and off-the-job learning and qualifications" (2004, p. 34). The contribution of a TAs wider background and experience emerged as a strong theme in the interview with Emma. Analysing TAs' experiences in terms of "a (unique) range of learning opportunities", both current and historical, "which make up their learning territory" (Fuller and Unwin 2004, p. 34) and looking at a variety of such territories may provide valuable insights for thinking about future curriculum design. As Emma so eloquently put it, "it's not a sausage factory..."

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