

The views of pre-service teachers on the school-based learning component of their mathematics teacher preparation programme

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Teacher preparation is a highly contested area in England with a range of epistemological approaches potentially being promoted through the availability of a range of preparation routes. The dominant model of teacher preparation used by programmes led by university education departments is that of developing reflective practitioners. However, other models, including those coined as 'craftworker' and 'executive technician' in Winch, Oancea, & Orchard (2013), are increasingly promoted by government policy. Aspects of professional training such as learning from a more experienced mentor, learning as part of a 'community of practice' (Lave & Wenger, 1991) and the need for practical experiences are all characteristics that parts of teacher preparation share with models of vocational learning and with those in other professions. This paper seeks to explore some of the views of those on secondary mathematics teacher preparation programmes with regard to the characteristics of their school-based learning and their experiences on school placement. Data collected from those on a well-established university-led Postgraduate Certificate of Education programme is compared with that from those on a new school-led School Direct programme indicates some commonality of experiences and suggests possibilities for future work.

Keywords: teacher preparation, pre-service mathematics teachers, school-led initial teacher training

Introduction

Teacher preparation in England is currently undergoing a re-invention following significant change in government policy requiring most of it to be provided through school-led programmes rather than through well-established university-led programmes. In the new programme, called School Direct, pre-service teachers are based in schools and spend at least 80% of their time in school, compared to the university-led routes where 67% of the time is spent in schools. School Direct programmes are offered as a training route (requiring the payment of fees but attracting a training bursary) or a non-fee paying salaried route, available to those with three year's work experience, where the school employs the pre-service teacher as an unqualified teacher for the year. The move towards a heavily school-based and school-led model of teacher preparation is premised on views that increased experience in schools for pre-service teachers necessarily leads to better learning outcomes for school students (this view is critiqued in Burn & Mutton, 2013, for example) and on learning to teach through an apprenticeship model (suggested in Gove, 2010). A massive increase in the number of teacher preparation places allocated to School Direct programmes has led to a corresponding decrease in the

number of places allocated to universities for more traditional routes, and this has led to significant change within university education departments.

This study reports on data from a well-established university education department offering the traditional university-led programme and also working with local schools to offer the School Direct route for secondary school mathematics. The data reports from 25 pre-service teachers on a traditional university-led route and 17 on a School Direct route, most of whom were salaried employees of schools. In terms of the university provision, parts of the taught programme were delivered jointly, with those on the salaried and training routes for School Direct following the same programme.

Literature Review

Models of teacher learning

Underpinning the debate surrounding the move to school-led teacher training are notions regarding the purpose of teacher preparation and, indeed, conflicting views as to the nature of teaching. One way of exploring the shift in teacher preparation in England instigated by government policy is by considering the possible different intentions of teacher preparation routes and differing perceptions of the purposes and outcomes of such programmes.

Kansanen (2014) suggests that there are two levels of teacher education, the first of which he describes as *basic* and which "...deals with everyday practice with all possible standard teaching methods and activities in practice" (p.280). He suggests that, whilst it is commonly believed that it is possible to learn much of this in school, his view is that "Teacher education ensures that pre-service teachers have the support to develop competences systematically and with confidence" (ibid. p.281). Kansanen calls the other type of teacher education *conceptual* and says that this is "...aimed at the sustained development of a teacher's work" (ibid. p.282) requiring discussion, thinking, reflection and research and that the key principle in this approach is that of metacognition.

Conceptualising teacher preparation in a different way, Winch et al. (2013) use three interconnected and complimentary aspects of teachers' professional knowledge: situated understanding, technical knowledge and critical reflection. They assert that getting the balance between the three wrong leads either to the model of a teacher as a craft worker, which "...overplays the value of situated professional knowledge at the expense of technical knowhow and critical reflection" (ibid p.1) putting faith in common sense and experience, or an executive technician, which "...foregrounds the contribution of teachers' technical knowledge of effective classroom practice at the expense of situated professional judgement" (ibid p.1) i.e. 'what works'. Winch et al. further assert that professional practice requires a balance of all three aspects of professional knowledge. It becomes clear, then, that different epistemologies of teaching are likely to lead to qualitatively different outworkings of teacher preparation.

Teacher preparation – an apprenticeship?

Apprenticeship is generally defined in the literature about workplace learning as a form of preparation for work of a vocational nature, with a close tie to a specific occupation and is provided through programmes with a substantial element of workplace learning (Grubb & Lazerson 2006, Fuller and Unwin 2008, Ryan & Unwin

2001). Unsurprisingly, research on learning through apprenticeship is often premised on the work of Lave & Wenger (1991) on ‘communities of practice’ and this basis provides further justification for exploration for connections between aspects of teacher preparation and apprenticeship.

Of course, apprenticeships exhibit a range of features and Fuller and Unwin’s study of apprenticeships in the steel industry led to their development of a model of expansive and restrictive approaches where “...an apprenticeship characterised by the features listed as **expansive** will create a stronger and richer learning environment than that comprising features associated with the **restrictive** end of the continuum” (Fuller & Unwin, 2003 p.411-12). In terms of apprenticeship learning, a restrictive experience is characterised by limited opportunities, a narrow focus for learning and a sharp attention to the immediate need of the employer. An expansive approach is characterised by breadth of learning opportunities, understanding of the apprentice as a learner and an appreciation of the apprentice as an individual. Such features resonate with the experiences of pre-service teachers on teaching placement; hence, expansive and restrictive features may provide a lens for viewing these experiences.

Research design

School-led School Direct programmes are too new, as yet, for there to be evidence on their effectiveness as a teacher preparation route and space prohibits a discussion here about literature regarding the effectiveness of similar existing programmes. Therefore more bounded questions investigated here are:

- How do pre-service mathematics teachers on school-led and university-led routes view their experiences in schools?
- What are the differences between the experiences of those on the two routes?
- What are the similarities?

Data collection was undertaken by asking pre-service mathematics teachers to indicate their position on eight continuous scales relating to the following categories:

- status (from learner to employee);
- breadth (variety of learning experiences in school from broad to narrow);
- transition to teaching (how rapidly they started teaching classes);
- aim (of school placement in terms of competence as a classroom practitioner or for their life long journey as a teacher);
- ‘participative memory’ (previous experience of school placement in working with pre-service teachers);
- balance (in terms of whether there is sufficient time for training and reflection),
- access (to opportunities to develop the necessary skills and knowledge);
- participation (opportunities to work with other teachers in school).

An example of one of the scales used to collect data is shown in Figure 1.

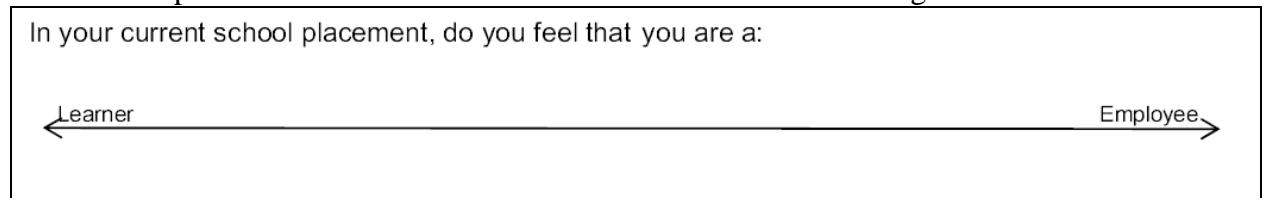


Figure 1: Example of a scale used for data collection

The categories and scales were developed and adapted from some of the features of expansive and restrictive apprenticeships in the work of Fuller & Unwin (2003),

selecting those features that were most appropriate for pre-service teachers to respond to and adapting them into scales for them to report a response. The features considered to be expansive were placed at the left-hand end of the scales in each case. Data collection was carried out as a part of normal course evaluation processes and took place in mid-May. Data were collected from 19 pre-service teachers on the traditional university-led programme, representing all those remaining on the course at this point, and from 14 out of the 17 on the School Direct programme. In order to analyse the data, the distance indicated along each line was measured and then used to produce boxplots and 1-variable statistics.

Findings and discussion

Figure 2 shows an example of a boxplot produced with the data. This is for the item asking about the balance of pre-service teachers' experience in school with regard to the time that they had for training and reflection.

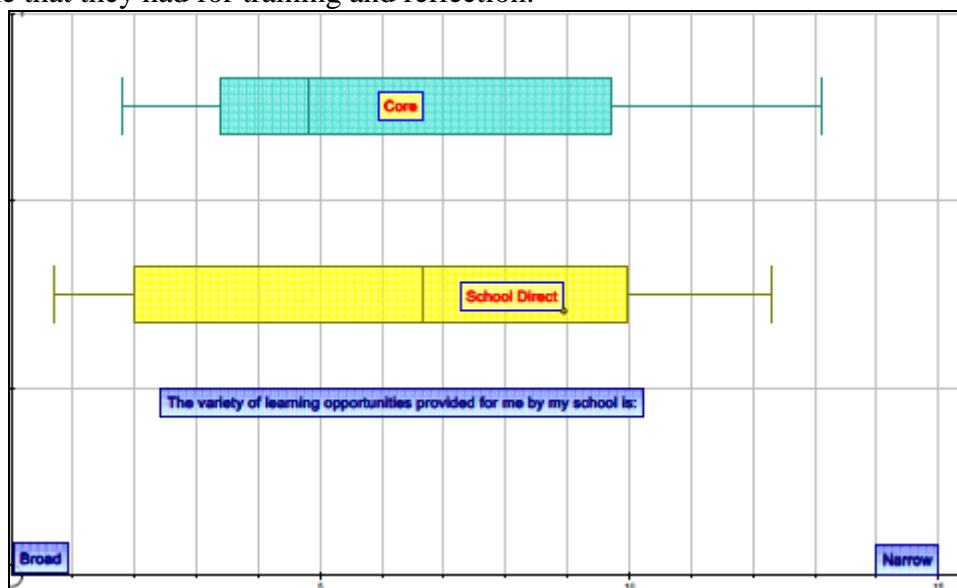


Figure 2: Boxplot for question on 'balance'.

The plot shows a lower (more left) median for School Direct participants than for those on the university-led programme, indicating that pre-service teachers on the School Direct programme felt more satisfied with the time they had for training and reflection. This may be a consequence of the point at which the data was collected, as those on the university-led programme had only 1.5 weeks of teaching practice followed by two weeks in university remaining and the School Direct pre-service teachers had more than eight weeks in school remaining. Hence, those on the university-led programme may have been feeling under considerably more pressure.

Figure 3 provides a summary of the results as a whole with the mean results from those on university-led programme shown in red, and those for School Direct participants in blue. The diagram clearly shows a similar pattern for the first six items, with pre-service teachers on the university-led programme consistently reporting slightly more expansive experiences on school placement than those on the School Direct programme.

However, there is a change in pattern for the final two items. Item 7 was about the perception of pre-service teachers as to the aim of school experience. On this item, the School Direct programme was reported as being more expansive. This result was unexpected, but may relate to pre-service teachers on the university-led programme feeling that being a competent practitioner is the purpose of their placement with the

university parts of the course supporting them with aspects more related to their life-long journey. Item 8 was about the opportunities that pre-service teachers have to work with other teachers in school. It may be that School Direct pre-service teachers indicate that they have more opportunities to work with other groups of teachers than those on the university-led programme because they had been in the same school since at least the beginning of September. Those on the university-led programme had only been in their current school placement since the middle of January.

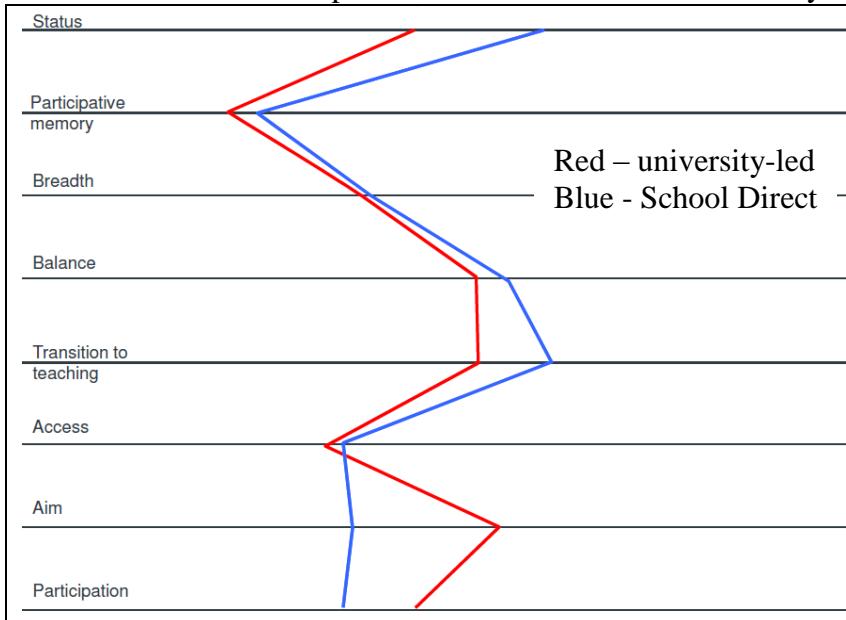


Figure 3: Comparison of results from pre-service teachers on university-led and School Direct programmes

In summary, Figure 3 demonstrates a close matching of the results from the two secondary mathematics programmes. This could be a consequence of the way that the institution concerned has closely developed the two programmes in parallel and perhaps this makes the School Direct experience as 'expansive' (using Fuller and Unwin's term) as the university-led experience because of HEI involvement. One could conjecture that the nature of being on a School Direct programme developed in partnership with a university, with the same tutor team working on both programmes, joint teaching etc. has limited the potential divergence between the two – so that the university acts a limiting factor on School Direct for the school partnerships it works with. The data, in particular the boxplots, offer some (limited) evidence of variation in practice – an increasing concern expressed by teacher educators (see, for example, Whitty, 2013).

Exploring variability using these sorts of criteria seems a potentially interesting way of examining aspects of school placement experience, but some facets are missing and it should be noted that does not reflect the full experience necessary for successfully starting teaching. The expansive/restrictive continuum is not necessarily a dichotomy, and it should be noted that such models do not describe the nuances in teacher preparation, nor do they take into account all the relevant features.

Implications and conclusions

The data reported on here is from two small cohorts from a single subject in a single institution and therefore cannot be generalised. The process of analysis raised issues about how best to deal with such data and to the need to further refine the instrument from that more directly derived from Fuller and Unwin's work. Comparison is clearly

problematic, and this also makes generalisation difficult. It may be that better comparison can be made during their first year in teaching.

This work is underpinned by concerns about the model of a teacher being promoted by current government policy and regulation in teacher preparation. Adapting Fuller and Unwin's continuum provides another lens with which to analyse the practical aspects of pre-service teachers' professional learning and with which to consider the barriers and affordances to learning in a school environment for pre-service teachers.

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