

TITLE:

Learning to be teachers of adult numeracy.

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ABSTRACT

This paper investigates how teacher education programmes provide adequate preparation for its prospective teachers. It uses adult numeracy teacher education in the post-compulsory education sector in England as exemplar. Using findings from two research projects on adult numeracy teacher education courses, the article investigates the applications of Bernstein's theories to teacher education, the approaches in which the diversity of prospective teachers is catered for on the course, the ways in which the recontextualization process may be incorporated into the course, the strategies to enable prospective teachers to learn to be teachers and the perception of prospective teachers regarding the weaknesses of their courses. Finally, this article mentions additional areas for research in order to gain further insight into the complex process of learning to be a teacher.

Learning to be teachers of adult numeracy.

1. Introduction

This paper asks how teacher education in the post-compulsory education sector in England provides adequate preparation to enable its cohort i.e. prospective teachers to become qualified teachers. It uses findings from two research projects on adult numeracy teacher education courses. The theoretical frameworks are by Bernstein (2000) relating to horizontal and vertical types of knowledge, and recontextualization (learning to be teachers). It then discusses the two research findings in terms of the aims of a teacher education course, examining how the course fulfils its aims from pre-entry through to post-qualification.

The relevance of this article, using adult numeracy as exemplar, in relation to teacher education includes: a) the applications of Bernstein's theories to teacher education, b) the approaches in which the diversity of prospective teachers (in terms of previous teaching, employment and life experiences) entering teacher education is catered for on the course, c) the ways in which the recontextualization process may be incorporated into the course, d) the strategies to enable prospective teachers to learn to be teachers, and e) the perception of prospective teachers regarding the weaknesses of their courses. It is not the intention of this article to imply that it has direct relevance to teacher educators i.e. those who are educating prospective teachers, and prospective teachers in all education sectors irrespective of national boundaries as it is dependent on contexts may they be education settings (sectoral, or institution-related) or country-related. However, there are fundamental issues such as the aim of a teacher

education course and the manner in which cohort is taught how to be teachers which are of relevance to teacher educators and prospective teachers in related fields.

This article is structured into five parts. The Introduction deals with the aims of this paper and a brief outline of the developments of teacher education in England in respect of adult numeracy courses. The next section provides details of two projects and the next part of the article discusses Bernstein's theories in relation to teacher education. The fourth section discusses the findings from the projects in relation to specific adult numeracy teacher education courses in England and examines their teaching methods more closely and their relevance to other teaching courses. This article concludes with a summary.

Since September 2002, the introduction of adult numeracy subject specifications by the Department for Education and Skills (DfES) and the Further Education National Training Organisation (FENTO) (2002) has meant that teachers in adult numeracy in England can, at last, be educated to a recognised standard as teachers in this subject area. The DfES is a government body, which seeks to create opportunity, release potential and achieve excellence for potential students in England. An important part of its work is the issue of policy documents. FENTO was a government body responsible for teaching and educating standards in the post-compulsory sector in England. It was superseded by the Lifelong Learning Sector Skills Council (LLUK) with wider responsibilities than FENTO previously, such as the professional development of those working in further education, higher education, work-based learning, and community learning and development. Prior to this, there were no government nationally approved subject specifications in England. Arising from the

Moser Report (1999), there were government initiatives to improve the educating of teachers in the three adult areas of literacy, numeracy and English for Speakers of Other Languages (ESOL).

According to the publication (DfES & FENTO 2002), the adult numeracy subject specifications for level four (which is equivalent to the first year of a first degree at university in England) were “designed to be used in specialist teacher education, in specialist modules for continuing professional development (CPD) and in other staff in-service training. For the first time in post-16 education, teachers of adult literacy and numeracy have the opportunity to work towards professional teaching qualifications. These new qualifications have to meet the generic Teaching and Supporting Learning standards set by FENTO and will integrate or be underpinned by these specialist subject specifications” (Forward pp 1). The generic Teaching and Supporting Learning standards were published in 1999ⁱ and are used in all generic post-compulsory teacher education courses in England. This step was a result of the recommendation from the Skills for Life report (Department for Education and Employment (DfEE) 2001) which stipulated that teachers specialising in numeracy and literacy skills would be expected to work towards subject specialist qualifications. The DfEE was superseded by the DfES in 2002.

The need for better educating of teachers is supported by two inspection reports. The first from the Office for Standards in Education (OfSTED) and the Adult Learning Inspectorate (ALI) (2003) found that adult numeracy provision wanting and stated that it required a sharper focus on education of teachers. OfSTED is the inspectorate for learners in England covering primary and secondary schools, colleges, teacher

education and youth work, and ALI are the inspectorate covering skills, workforce development and preparation for employment in England. The second report from OfSTED (2006) relating to generic teacher education programmes (i.e. prospective teachers with specialist subject knowledge entering the programme to acquire pedagogic skills) in England, reinforced the previous report by asking for a greater 'integration between taught and practice' (p 16) in order to improve teaching of prospective teachers to enable them to be professional teachers.

2. The two research projects

2.1 First Project

The main aim of this projectⁱⁱ was to evaluate courses in adult numeracy and literacy and ESOL in terms of how they are structured and implemented, including teaching practice. For this article, only the findings relating to adult numeracy are used. The project used quantitative and qualitative methodologies. Teacher educators or staff teaching on a variety of teacher education courses were asked to complete two questionnaires (at the start and end of the course). These courses included: joint (subject specifications and generic Teaching and Supporting Learning standards (generic teaching standards from now on) such as Certificate of Education in Adult Numeracy (Cert. Ed.) and Postgraduate Certificate of Education Adult Numeracy (PGCE)), and stand alone ones (subject specifications only such as Certificate in Adult Numeracy subject specific). The prospective teachers were asked to complete three questionnaires (at the start, during and end of the course). Seventeen teacher educators and 112 prospective teachers participated in the sample for adult numeracy.

All the teacher educators were interviewed twice mostly on a one-to-one basis and prospective teachers were focus-interviewed twice, if possible. There were eighteen focus group interviews with prospective teachers. The sizes of these groups ranged from three to ten. There might be instances where prospective teachers were only interviewed once due to the shorter duration of the course, which was not initially anticipated. In those instances, another group from the same institution was seen at a later date. One of the methods used in evaluating the organisation and delivery of the course included the 'audit trail' method where two or three topics in the subject specification were examined in terms of how they were taught and assessed. Teacher educators were also invited to three 'Practitioner Sessions' over the duration of the project, where there were opportunities for the project team and teacher educators to discuss preliminary research findings, to share views and to network.

The list of institution providers was initially obtained from FENTO. The final analysis was based on triangulation of sources from: interviews with teacher educators and prospective teachers, questionnaires from teacher educators and prospective teachers, practitioner sessions with teacher educators and course documents.

2.2 Second Project

This project used a questionnaire for those adult numeracy prospective teachers in the first project. They were asked before completion of the first project whether they would like to take part in this questionnaire project. Those who agreed were sent questionnaires electronically and by post after completion of the first project

regarding their previous working and teaching experiences, issues they encountered whilst on the course, the ways in which they were taught to be teachers of adult numeracy and the topics that they would like to see included on the course. Of the forty-three participants, thirty per cent completed and returned their questionnaires. This completion rate was very similar to the completion rate of prospective teacher questionnaire three in the first project.

3. Applications of Bernstein's theories to teacher education

This section investigates the first of the relevant point in the Introduction section using Bernstein's theories to teacher education. According to Sadovnik (2001), Bernstein developed language and the relationships between society, family and schools in terms of exercise of power and forms of communication codes. Bernstein went on to develop his code theory (i.e. elaborated and restricted) by linking it with the school curriculum (the knowledge to be taught), pedagogy (the way knowledge was transmitted) and evaluation (the manner in which the knowledge was assessed). His theory on specific "knowledge types" is particularly relevant to adult numeracy teacher education as prospective teachers' past teaching, employment and life experiences all impact on their learning journey. Also Bernstein's theory of recontextualization provides a suitable platform to investigate how prospective teachers become teachers in the contexts of subject specifications, teaching practice and past experiences.

3.1 Types of knowledge - horizontal and vertical

Bernstein (2000) distinguished knowledge into two forms: horizontal and vertical, which he also called “discourses”. Horizontal discourse is usually equally segmented, context specific and is ‘an outcome of a cultural specialization and its modes of acquisition and production are embedded in that specialization’ (Bernstein 2000 pp 172). Amongst its features, horizontal knowledge is non-translatable and uses specialized languages with non-comparable principles of describing a series of experiences.

Vertical discourse is defined as coherent, explicit and is systematically designed in a hierarchical order. It can also appear in the form of various types of languages with specialized ways of interrogation and production of texts. There are rules governing access, acquisition, transmission mediated through the process of recontextualization.

Bernstein’s theories were applied to compulsory education and not specifically to initial teacher education. However, the knowledge of horizontal and vertical discourses can be applied to prospective teachers enrolling on the level four courses in adult numeracy as a theoretical framework. These two discourses provide a useful method of classifying prospective teachers’ past experiences enrolling on level four adult numeracy programmes. The ‘horizontal knowledge’ of prospective teachers might include previous teaching experiences in the adult numeracy, post-compulsory or compulsory education sectors. It might also include any experiences in a voluntary capacity where a prospective teacher was exposed to learners with learning issues that might impede their acquisition of knowledge. Other types of horizontal knowledge might be in the work place or part of life experiences such as parenting. These experiences may not be automatically translatable to the learning process for

prospective teachers. Part of the tutor's responsibility is to 'draw out' relevant knowledge and highlight its applicability to the prospective teachers. However, notions of accessibility of knowledge/experiences might have relevance to the courses in this article and the impact this might have in terms of pre-enrolment procedures, course delivery and teaching practice could be significant to prospective teachers.

In terms of vertical knowledge, its relevance to this article can include the appropriateness of the content in the subject specifications (and generic teaching standards for joint courses) and the manner in which subject specifications are acquired e.g. alongside generic teaching standards, before or after generic teaching standards. The relevance of vertical knowledge also includes the manner in which this knowledge is transmitted from teacher educators to prospective teachers such as explicit or implicit. The final point regarding the relevance of vertical knowledge is how course content relates to teaching practice.

3.2 Recontextualization process

With regards to recontextualization, Bernstein (2000 and 1990), saw this process as part of the pedagogic process of acquisition, transmission and evaluation. These three facets are very much related to his earlier discussion of school curriculum, pedagogy and evaluation respectively.

The rules governing transmission relate to the theory of instruction (i.e. how) and the valid knowledge to be instructed (i.e. what). Bernstein gave two fields namely: an official recontextualizing field (ORF) and a pedagogic recontextualizing field (PRF).

ORF is one that is created by the state and its selected institutions. In the context of this article, the state corresponds to the present New Labour government and the institutions to FENTO and DfES, which are responsible for producing the adult numeracy subject specifications and generic teaching standards. PRF, according to Bernstein, can consist of teacher educators, writers of textbooks, and curricular guides. With this article, the PRF can be teacher educators of level four adult numeracy courses. Therefore the notion of recontextualization from the point of view of the article may be interpreted as the way in which the subject specifications and generic teaching standards are used on the course to enable prospective teachers to become teachers of adult numeracy.

Thus the two theories of Bernstein's, horizontal and vertical knowledge, and recontextualization, provide a framework for analysing and accommodating prospective teachers' diverse backgrounds in terms of teaching, employment and life experiences on a teacher education course, and how their know-how and abilities alongside subject and pedagogic knowledge may be used in relation to teaching them to be teachers.

4. Findings and discussion

This section addresses the points which are of relevance to other teacher education programmes such as: the approaches in which the diversity of prospective teachers (in terms of previous teaching, employment and life experiences) entering a teacher education is catered for on the course, the ways in which the recontextualization process may be incorporated into the course, the strategies to enable prospective

teachers to learn to be teachers, and the perception of prospective teachers of the weaknesses of their courses. It is structured in three parts: pre-entry, during, and after the course with reference to the above theoretical underpinnings.

4.1 Pre-entry

Of the 112 prospective teachers who completed the questionnaires in the first project (out of a possible total of 142), fifty-four per cent were registered on the in-service courses (i.e. subject only course in which prospective teachers are already teaching adult numeracy and already holding a generic teaching qualification) and forty-six per cent on the pre-service courses (i.e. prospective teachers with no or little teaching experience on joint courses of subject specifications and generic teaching standards). In theory, the in- and pre- service courses had different entry requirements but the first research found that prospective teachers accepted on these courses were more diverse, e.g. prospective teachers on the in-service course might not have teaching experience or a generic teaching qualification, than expected. It is interesting to note that for both types of courses – subject only and pre-service – the majority of prospective teachers are females with 54 and 60 per cent respectively. This is in contrast with the traditional assumption of a male preserve in this subject area.

As regards highest mathematics qualifications on entering the courses as ascertained for Project 1, nearly 50 per cent of prospective teachers have up to level two. In England, level two is equivalent to the General Certificate of Secondary Education (GCSE) and is normally taken by students with ages of around 15-16. Four out of five prospective teachers have level three or below as their highest mathematics

qualifications. The 'Level Two' group, with level two mathematics knowledge, may have implications for teacher educators when it comes to covering the subject content for these level four courses. One needs to mention that the data does not enable the research team to ascertain whether some of the prospective teachers also have related mathematics first or higher degree qualifications. This also applies to the level of English prospective teachers have on entry. Almost three out of every four participants who completed the questionnaire have only up to level two English qualifications. Less than 10 per cent of prospective teachers have a first or higher degree in English. The level four courses will require a certain degree of writing and this may have implications in terms of assessments.

Turning to age bands of prospective teachers, they are mostly represented in the 31-50 band (53 per cent in in-service/subject only and 67 per cent in pre-service/joint courses). The next significant age band is 51 plus accounting for 35 and 25 per cent respectively. Traditionally, this area of teaching is not known as a first career as evidenced by this finding. Instead, it is for those who want a change in mid-life due to early retirement, redundancy, and career break such as bringing up a family. Some examples of previous careers of prospective teachers in our sample which include careers related and unrelated to mathematics are: engineering, the forces, care assistant, customer relations, manager in industry, finance (Euro Bonds and Accountancy), teacher in compulsory sector, self-employment and Inland Revenue.

Table I provides data on prospective teachers from the two types of courses with past teaching experience in institutions.

[Insert Table I]

Table II gives a summary of teaching experience of numeracy prospective teachers in

each sector with their respective years of experience.

[Insert Table II]

So, how does a teacher educator take into account prospective teachers' diverse experience on or before entry? This question relates to the second relevant point in the Introduction section. From the findings, approaches used included pre-entry assessments. They come in two types: diagnostics and tests depending on whether the course focuses on the deficit or inclusive model. Of the nine institutions (five higher education institutions and four further education colleges) delivering the courses, six have some form of initial assessments, some include writing and comprehension assessments, and all nine have either formal or informal interviews. From Bernstein's horizontal knowledge viewpoint, six delivering institutions have tried to ascertain prospective teachers' mathematics knowledge, and to a limited extent writing skills, when enrolling on level four courses. How these are reflected in course deliveries will be discussed in the next section. There might be a number of reasons for those institutions not having pre-entry assessments. It could be that an institution might want to have an open-door policy in order to increase the number of adult numeracy teachers in a capacity building exercise as part of its commitment to Skills for Life Report (DfEE 2001). Alternatively, it might be that they wanted to take on all applicants in order to initiate this new course as an experiment, which could be reviewed later.

Given the diversity of prospective teachers' past experiences, what are the implications for course structure and delivery? Using Bernstein's theories of horizontal and vertical knowledge, delivering teacher education to prospective

teachers is complicated by the fact that they come with rich and relevant past experiences in areas like teaching, employment, parenting and everyday life. Thus individual prospective teachers have different requirements from the course in terms of their potential contribution and needs. An example might be that a prospective teacher had years of teaching experience in adult numeracy and thus could contribute to areas related to profiling of that prospective teacher's adult learners, their motivation levels and learning abilities or disabilities. What the prospective teacher might require from the course could be a greater understanding and depth of the subject specifications and a link-up with practical teaching skills, so that numeracy could be delivered to the prospective teacher's adult learners. Another type of prospective teacher might be someone with a high level of mathematics knowledge but with no teaching experience. The needs of this prospective teacher are not so much a coverage of the subject specifications but the way in which mathematics knowledge can be applied in the classroom to help the prospective teacher to teach the subject to adult learners.

The two previous examples of prospective teachers taken from the two projects represent polarised cases of the spectrum of horizontal knowledge. This diversity represents a real challenge for course leaders and teacher educators in deciding the type of courses to provide and how to implement them. On a subject only course, how does one cater for those with academic qualifications in mathematics (past vertical knowledge) in such a way that also teaches prospective teachers to apply mathematics knowledge to teach to their learners? This question also throws up issues such as the depth and breadth of each prospective teacher's mathematics knowledge as different mathematics syllabi would have been learnt. Accredited prior learning (APL) might

be one way of offering prospective teachers recognition with the relevant mathematics knowledge. On entry to the level four adult numeracy courses, a quarter of prospective teachers indicated that the APL facility was discussed but very few, for whatever reason, took up this option. Possible reasons might be the lack of support structure for those willing to be 'APLed', and institutions might not have this facility up and running. One prospective teacher, having encountered learning theories several times before, still had to do them on his course as there was no APL facility offered.

The two projects indicated that prospective teachers with no teaching experiences and/or related qualifications had been accepted on in-service courses where only subject specifications were taught and on pre-service courses, prospective teachers had teaching qualifications as no in-service courses were available in that region. There were also prospective teachers who did not come into adult numeracy teaching via the academic route and thus had limited formal experience of pedagogic and mathematics knowledge i.e. what Bernstein called restricted code. How are these prospective teachers catered for on a level four course? These points highlight some issues resulting from the projects' findings on the diversity of prospective teachers' past experiences, which provide a challenge to teacher educators and course designers in terms of course structure and implementation.

4.2 During the course

This part explores the structuring of courses in terms of subject specifications and generic Teaching and Supporting Learning standards and whether prospective

teachers' past experiences are taken into account from the contexts of course organisation, implementation and teaching practice. It also examines how courses deal with the process of recontextualization.

4.2.1 Course structure

The first project points to a variety of adult numeracy course structures from the sample of nine institutions. The example below shows how recontextualization process may be incorporated into the course (the third relevant point in the Introduction section).

This is a subject only course, which is offered by a university. It is a one-year part-time course, which is collaboration between the university with over 20 years of adult teaching in sciences and a local FE college with expertise in teacher education. It offers 110 hours of taught sessions with three modules, and prospective teachers are required, as per FENTO requirements, to teach 30 hours whilst on the course. The first module has 44 taught hours and it aims to develop adult numeracy skills i.e. maths content by using practical applications to help prospective teachers with their maths understanding. The teacher educator's intention is "to make the subject of mathematics interesting for them and to link the content with adult numeracy teaching to their adult learners." The second module has 74 contact hours, of which 22 are delivered classes, 44 are workshops and the remainder are teaching, peer and tutor observations. It aims to develop its prospective teachers' professional practice and to apply maths knowledge to adult numeracy skills pedagogy and to use a range of teaching techniques to help prospective teachers teach their adult learners. In this

module, prospective teachers attempt to link theory with teaching practice i.e. implementing the recontextualization process. The last module covers the social and personal factors in the subject specifications. This course has a strong ethos to join-up the subject specifications with teaching skills and knowledge as shown in the second module. It uses practical examples of how maths theories can be applied.

This case study is an example of ‘best practice’ found in the first project. It deals with the issue of joining up subject specifications (mathematics content) with generic teaching standards (which is not a mandatory requirement), thus enabling prospective teachers to learn how to become teachers of adult numeracy. Of the total seventeen courses researched in the first project, three offered an explicit route of recontextualisation. If they are offered, they are found in taught sessions of mathematics content (i.e. subject specifications) in in-service courses and/or in generic teaching standard classes in pre-service courses on an ad hoc basis. The other fourteen courses in the same project had no strategy to facilitate recontextualization.

What are the implications of an explicit approach to recontextualization to adult learning as opposed to ad hoc approach? Interviews with teacher educators of the three courses that attempted to provide a ‘targeted’ approach seemed to agree on some common ground. They included linking mathematics knowledge and teaching knowledge and skills (including teaching practice), offering different approaches to help prospective teachers to apply both mathematics and pedagogic knowledge in ways that enable them to teach the subject to learners who, for whatever reasons (cognitive, psychological or emotional), did not respond to previous teaching methods, and indicating that the separate aspects of the course content – subject

specifications and generic teaching standards – need to be viewed as a whole in order to facilitate prospective teachers becoming teachers. Prospective teachers with this approach are aware of the two contents and the different techniques that can be applied to link them together for teaching adult learners.

For those with the ad hoc approach, the learning experience is different from the point of view of content. Since teaching techniques and ways of using pedagogic and mathematics knowledge are included in taught sessions which cover the two contents, the prospective teachers might not be able to distinguish content (pedagogic or subject) and recontextualization methods. Any future changes to either of the contents might pose difficulties, as the pedagogic techniques are indistinguishable from the elements of subject or teaching content. If a new element was introduced into the subject specifications, a teacher educated in this approach might not have knowledge of generic recontextualization techniques to apply to the new element. Conversely, a student group with different learning abilities might pose problems to such a teacher, as they required different pedagogic approach. Another possible difference is the variation of levels between subject content (of the level four course) and the levels at which teachers deliver. If the variations in numeracy levels and pedagogic methods are not explicitly pointed out to prospective teachers, then it may pose problems in their teaching.

4.2.2 Implementation

This part of the article provides examples of strategies to enable prospective teachers to learn to be teachers (the fourth relevant point in the Introduction section). An

example of an assignment below relates to the ‘audit trail’ research methodology used in the first project to try and track how a particular topic is taught. It illustrates how algebra, as a particular topic in the subject specifications, is delivered in order to try and find ways of linking the abstract idea of algebra to real life situations, which in turn may be applied by prospective teachers teaching their adult learners.

One of the institutions uses the ‘Broken Keys’ activity with small groups of prospective teachers. This involves using maths functions such as brackets, operators, division, multiplication and division and subtraction (BODMAS) to create maths problems for one participant in the trainee group to solve. This enables prospective teachers to understand the problems, which can arise for learners. The next exercise is forming and rearranging words to match pictures and equations. A discussion of the activity occurs afterwards. Each group explains how an equation may be solved and another group provides feedback on the various methods used in the previous exercise. Finally, there is a review of how these approaches can inform prospective teachers about appropriate teaching methods to use for their adult learners.

This example illustrates a way in which a course can help prospective teachers to become teachers of numeracy. How prospective teachers individually learn to become numeracy teachers is an area that is beyond the two research projects. The interviews with prospective teachers and teacher educators highlighted that fact that the journey to becoming a numeracy teacher was a personal one, depending on such factors as past personal experience, personality, learning abilities, and learning preferences. This personal journey has strong resonance with a line in T. S. Eliot’s (1969) *Four Quartets* “we shall not cease from exploration, and the end of all our exploration will

be to arrive where we started and know the place for the first time”(pp 197). A prospective teacher’s journey to becoming a teacher is not a straight path as indicated by Dawson (2003 pp118) with reference to the Four Quartets as being “difficult, messy, fragmentary, and often retrospective, gained more from looking back than embracing the immediacy of the moment.” Learning to be a numeracy teacher is not just about knowing the subject specifications and generic teaching standards and how they are related and applied in classroom. It is more than facts. It is a learning process that has different significance for individual prospective teachers. Learning to be a teacher is a multi-dimensional process, which does not stop at the end of the course but carries on throughout one’s lifetime. If this is the case, it throws into question the relevance of course outcomes and assessments. It can have different interpretations with each experience and unlike facts it does not have a ‘right’ way of teaching. It is dependent on the synergy between teacher, learner, and prevailing circumstances.

Besides investigating the ways in which specific mathematics topics are delivered, there are also other avenues to help prospective teachers to engage with the process of teaching them to be teachers of adult numeracy. Based on Questionnaire Two of the first project, they included microteaching, writing lesson plans, preparing schemes of work, compiling portfolio/teaching file, and assessing personal numeracy skills (i.e. mathematics knowledge).

4.2.3 Teaching practice

This is one area in which prospective teachers were satisfied. The observations and related feedback carried out by teacher educators and mentors/teaching members at

their host institutions were useful in guiding them towards ‘good practice’. Table III below provides summaries of prospective teachers’ perspectives on support and on feedback in their teaching practice, which are based on the first project’s second trainee questionnaire.

[Insert Table III]

Interestingly, only 48 per cent, of a total of 42 prospective teachers who completed questionnaire three, were observed by a numeracy specialist. Therefore over half were observed by non-numeracy specialist. This perhaps indicated the newness of the professionalisation of this subject area, as one would not expect there to be sufficient number of teacher educators with numeracy specialism.

How has the prospective teachers’ past knowledge (from their experiences), which include academic qualifications, teaching practice and other relevant life experiences, been used on the courses? This question relates to the second relevant point in the Introduction section. Eighty-six per cent of prospective teachers who responded to the third questionnaire in the first project indicated that they were encouraged to use their previous professional/academic/vocational experience and knowledge. Some examples given to support this included: previous work experience in learning support and learners with mathematics anxiety, practical use of mathematics, use of varied learning styles to influence their teaching, and parts of the mathematics specifications were familiar to them from industry. Furthermore, when asked to suggest ways in which their past experiences and knowledge could be used more effectively, their replies included: more time in sessions to discuss their teaching triumphs and

disasters, the use of colleagues who were highly qualified in mathematics to mentor those with lower mathematics skills, more peer tutorials and teaching, an initial assessment of prospective teachers' experiences to allow teacher educators to understand where they were coming from, and use of other prospective teachers' knowledge of subject areas to show how numeracy skills could be used. The idea of peer support came up frequently in focus interviews with prospective teachers where this was seen as a positive addition to a level four adult numeracy courses.

4.3 After completion of the course

The final part of the discussion investigates, using questionnaire in the second project, qualified prospective teachers' perceptions of the weaknesses of their courses as regards recontextualization, and how it is carried out in their programmes they have just completed. This part of the article relates to the final relevant point in the Introduction section.

The missing areas prospective teachers felt that could improve their courses relating to recontextualization included: methods of teaching numeracy as a basic skill, ideas for practical activities and games to enhance understanding of mathematics, ideas and examples of good teaching strategies for specific mathematics topics, more opportunities to exchange ideas, more emphasis on use of information technology as a resource to help in the teaching of numeracy and strategies to help prospective teachers to build up their confidence in teaching adult numeracy.

Regarding how the recontextualization process is carried out in taught sessions,

examples of prospective teachers' and teacher educators' comments from the 'after completion' questionnaire (in the second project) follow next.

One prospective teacher gave the example of a three-day course on the Core Curriculum, which was used in schools and at level two, as useful in the recontextualization process. However, the courses investigated related to mathematical content at level three and analysis at level four. There were frequent views around the idea that the subject specifications did not inform teacher educators what strategies and teaching and learning approaches to apply to help prospective teachers use the mathematics content to teach their adult learners. Using a Bernsteinian approach is useful to evaluate the effectiveness of the level four adult numeracy teacher education programmes as the main criterion is to ascertain if these courses teach prospective teachers how to become teachers of adult numeracy i.e. how to teach. As indicated above, only three of the seventeen courses in the NRDC project sample offer an explicit approach to recontextualization. The other fourteen courses offer an ad hoc recontextualization approach in some of the taught sessions and variations of quality are voiced by prospective teachers, a sample of which are indicated below:

“I wanted practical, hands-on approaches and strategies of how to teach adult numeracy in my classes and not theoretical stuff.”

“A lot of my previous training in adult literacy could be applied in adult numeracy and I learnt more from those courses than this one to date.”

“There are very few sessions to help me to recontextualize subject knowledge and teaching knowledge.”

“It is content driven and there are few strategies to help us to teach. Most of the time, it is left to us to think of how the content can be applied to classroom teaching.”

“There is too little time to cover subject specifications and teaching standards adequately but still it is a very positive experience.”

5. Summary

This paper investigates how a teacher education programme, using adult numeracy in post-compulsory in England as exemplar, educates its cohort to be teachers. Using the findings from two research projects, the article indicates five relevant points with other teacher education courses in regards to: the applications of Bernstein’s theories to teacher education, the approaches in which the diversity of prospective teachers (in terms of previous teaching, employment and life experiences) entering a teacher education is catered for on the course, the ways in which the recontextualization process may be incorporated into the course, the strategies to enable prospective teachers to learn to be teachers, and the perception of prospective teachers of the weaknesses of their courses.

Though this paper uses adult numeracy teacher education as a way into investigating the multi-dimensional area of learning to become a teacher, it still has relevance to other teacher education programmes. Bernstein’s theory on knowledge is useful in understanding this area as it creates a framework in which the diverse experiences of prospective teachers can be understood and taken into account in course delivery. The recontextualization theoretical framework provides an insight into the *raison d’être* of a teacher education programme and the importance of linking subject and pedagogic

knowledge. The research findings provide a greater understanding as to how the horizontal knowledge of prospective teachers can be taken into account at the pre-entry and on the course stages. The use of APL could be an alternative approach to acknowledging and accrediting such experiences. As regards the methods to enable prospective teachers to learn to be teachers, there were examples of how in some courses this was carried out together with issues of adopting an explicit or ad hoc approach and delivery at different levels. The article discussed the complex journey a prospective teacher needed to travel and it also offered some strategies for recontextualization such as peer support, microteaching, examples of good teaching approaches for specific mathematics topics and opportunities for exchange of ideas.

This paper merely highlighted some of the salient points regarding this complex area of educating teachers and much more research ought to be carried out if a greater understanding of this area was to be gained. Some areas for further research might include: personal journeys of those learning to be teachers, the interaction between teacher knowledge, learning to be teacher and performative nature of this profession, and other factors such as teacher educators' knowledge and experience, awarding institutions, and funding that might impact on this complex process of becoming a teacher.

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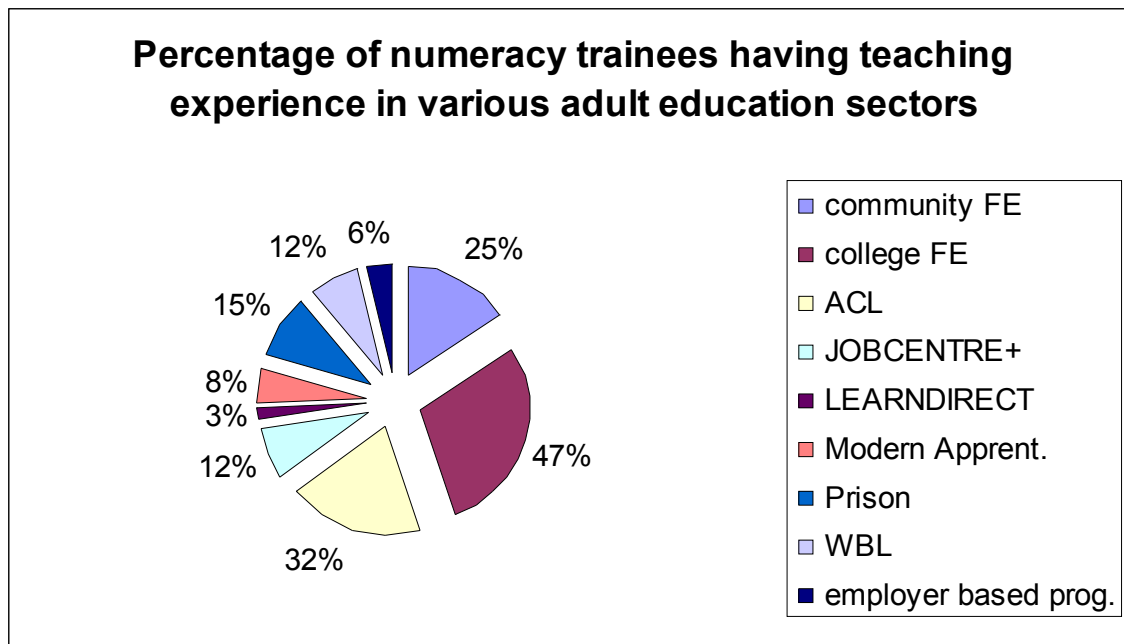
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Table I – Prospective teachers on the two types of courses with past teaching experience in institutions.



The percentages are non-discrete thus one trainee/prospective teacher may have teaching experiences in more than one institution.

Further education colleges in England are education institutions for those who have completed compulsory education, like GCSE, and want to carry on with post-compulsory education or with repeating GCSE subjects. About half of the students are over 21 years of age. These FE colleges offer adult learners with additional opportunities to pursue their educational aims. A significant proportion of subjects offered by FE colleges are in the vocational or related areas.

Modern apprenticeships are vocational training courses that are linked with industrial practice. These courses are usually linked with further education colleges and industrial companies in such areas like engineering and construction.

Table II - Summary of teaching experience of numeracy prospective teachers in each sector with their respective years of experience

Adult education sector	Count & percentage of numeracy prospective teachers with teaching experience to respective sector		Years of experience			
			0-1y	2-5y	6-10y	11+
College based FE	50	29%	7 14%	21 42%	11 22%	11 22%
Community FE	27	16%	8 30%	12 44%	5 19%	2 7%
ACL	34	20%	9 27%	20 61%	3 9%	1 3%
JOBCENTRE+	13	8%	4 31%	8 61%	0	1 8%
LEARNDIRECT	3	1%	2 68%	1 33%	0	0
Modern Apprentices.	9	5%	4 44%	4 44%	1 12%	0
Prison	16	9%	5 33%	8 53%	1 7%	1 7%
WBL	13	8%	5 38%	7 54%	0	1 8%
Employer based programmes	7	4%	1 14%	3 43%	2 29%	1 14%

Table III – Summary of prospective teacher’s perspectives on support and on feedback in their teaching practice.

Scales of questionnaire questions	Count & percentage of prospective teacher’s perspectives on support in their teaching practice	Count & percentage of prospective teachers’ perspectives on feedback in their teaching practice
Very helpful	26 47%	27 49%
Quite helpful	8 15%	12 22%
Average	2 4%	1 2%
Inadequate	2 4%	0 0%
Non-existent	1 2%	1 2%
No answer	16 29%	14 25%

ⁱ Since writing this article, the FENTO standards have been superseded by the “New overarching professional standards for teachers, tutors and teacher educators in the lifelong learning sector” in January 2007.

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