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Cognitive apprenticeship: meeting the needs of student teachers

Jacqui Dean

Introduction

What do HEI students want and need? David Watson (2006) pointed out in a recent article that if universities are to function effectively in the twenty-first century it is essential to research the answers to this question.

This paper reports on a first step in such research, focusing on one section of the student body, those in initial teacher education (ITE) training to become primary school teachers. Teaching is a highly demanding profession, requiring a complex knowledge base. This includes:

- Academic subject knowledge, both propositional and procedural.
- Pedagogical knowledge. This is hugely complex, involving knowledge and understanding of: pupils' academic, social and affective dispositions and needs; classroom management; appropriate teaching styles, classroom organisation, how children learn, and a range of appropriate teaching strategies.
- Teaching subject knowledge: knowledge of how to teach a particular subject effectively. (McNamara, 1990; Shulman, 1986).

Students doing a four-year teaching degree, the BEd, at Leeds Met take eight modules a year, two of them in their specialist subject, totalling eight specialist subject modules over the degree course. In History, in five of the eight specialist subject modules, students study the subject itself as an academic discipline. The remaining three specialist History modules focus on how to teach the subject, as well as on academic knowledge. The challenge for the History tutors is to explore productively the relationship between the academic domain of History and its teaching. Our students need to understand both the academic domain and the highly complex art and craft of teaching in the school classroom.

They also spend an average of a third of each academic year in schools. This includes single days, single weeks and blocks of 5-7 weeks in their final two years. It is during their school experience that students acquire much of their pedagogical knowledge. School staff have over recent years become increasingly professional at mentoring the students and inducting them into the craft of teaching.

Cognitive Apprenticeship

It could, therefore, be argued that this constitutes cognitive apprenticeship, as defined by Brown et al (1989, p. 32):

“Cognitive apprenticeship attempts to develop densely textured concepts out of and through continuing authentic activity. The term is closely allied to our image of knowledge as tool. Cognitive apprenticeship supports learning in a domain by enabling students to acquire, develop, and use conceptual tools in authentic domain activity, just as craft apprenticeship enables apprentices to acquire and develop the

tools and skills of their craft through authentic work at and membership of their trade. Through this process, apprentices enter the culture of practice”.

Can education lecturers, then, rely on schools to provide student teachers with their pedagogical content knowledge, and concentrate on academic and professional knowledge? The answer must be no, for two major reasons:

1. It is unreasonable to expect schools to have the depth of scholarship and breadth of vision that a university can provide. Student teachers in schools are unlikely therefore to experience either the full range of pedagogical strategies available or articulation of the theoretical rationale for using them. In around half of schools the Qualifications and Curriculum Authority’s schemes of work are closely adhered to, so students in these schools may experience conformist orthodoxy rather than creative teaching.
2. There is an interim process, in university classrooms, to prepare student teachers to become confident and effective teachers. Only a university can consistently make the links between research and practice that underpin good teaching in school.

In this context cognitive apprenticeship is a productive, indeed crucial, teaching approach. Cognitive apprenticeship is based on situated learning theory (Lave and Wenger, 1991) and was applied by Collins et al (1989) to a form of learning where ‘conceptual and factual knowledge is exemplified and situated in the contexts of its use... It is this dual focus on expert processes and situated learning that we expect to help solve the educational problems of brittle skills and inert knowledge’. (Collins, Brown and Newman, 1989, p. 457) Cognitive apprenticeship, therefore, offers teacher educators a contextualised way of teaching the ‘craft knowledge’ of teachers (John, 1991). It provides students with tools and scripts (Schank and Ableson, 1977) for pedagogical action and with experience of integrating these with subject methodology. Normally, it involves a pattern of demonstration, modelling, implementation and review, where teacher educators can demonstrate and model to the students the processes involved in expert teaching (Turner-Bisset, 2001). The students in turn implement the strategies and resources during their school practice, followed by review via discussion with a tutor, or recorded in their assignments or professional development profiles.

Over several years myself and two HEI colleagues delivered accredited Continuing Professional Development courses to teachers in five local education authorities, based on the principles of cognitive apprenticeship (see Dean, 1997; Nichol and Turner-Bisset, 1998; Nichol and Turner-Bisset, 2006). The impact of the courses was extensive, and documented by the teachers: they all implemented approaches from the courses into their classroom practice and reported these through presentations to fellow-teachers and through writing up the initiatives for inclusion on the Nuffield Foundation’s history website (see www.primaryhistory.org).

How much more do fledgling teachers on ITE courses need cognitive apprenticeship as, unlike the teachers on our Continuing Professional Development courses, they do not have a wealth of classroom experience to draw on?

Cognitive Apprenticeship in Teacher Education

In Carnegie, the three modules concerned with the teaching of History are based on Nuffield History principles (Fines and Nichol, 1997; www.primaryhistory.org). These have at their heart ‘doing history’, where pupils in school are introduced to history as an enquiry-based discipline, and challenged to question, to think actively and to engage with authentic sources of historical evidence. Over the past two years, I have used cognitive apprenticeship approaches in two of these modules, conducting a case study with three groups of ITE students following the history specialist route (33 students in total).

I began using the cognitive apprenticeship model by analysing the repertoire of teaching approaches I wanted the students to develop. These encapsulated the key concepts and processes involved in 'doing history' with pupils (Hexter, 1971; Fines and Nichol, 1997; Nichol and Dean, 1997; Turner-Bisset, 2005; www.primaryhistory.org).

A crucial element was my own experience of teaching in schools, using these expert teaching approaches (I have taught five to ten week units of history in Yorkshire primary schools on average once a year for the past 16 years).

The teaching of the modules followed the cognitive apprenticeship pattern of demonstration and modelling, implementation and review.

Demonstration and Modelling

During both third and fourth year modules I demonstrated how to approach History topics in the classroom. The approaches were firmly grounded in three key areas: academic History; research into children's learning in History; and pedagogical practice. In all cases I used as exemplars lessons that I, or teachers on my Continuing Professional Development courses, had taught. These demonstrations were thus authentic, taken from real lessons taught in schools: the students were treated in the lessons as though they were pupils, experiencing the same repertoire of teaching strategies, resources and processes of learning as the school children had done, within the same time-frame. In each session, the students were introduced to the philosophical, academic and pedagogical rationale for the teaching approaches employed, and the research underpinning their use.

Each session also included a constructive and analytic discussion about what were the expert teaching's main features, with the students building up mental models of both features and process.

Implementation

The students used two specific opportunities to implement and apply the knowledge gained through the cognitive apprenticeship sessions. The first was while working with local children at Armley Mills Industrial Museum, the second was during their final teaching practice. At Armley Mills, for example, several of the students used storytelling with the pupils.

Review

The Armley Mills day took place during the module, so we were able to review the students' teaching experiences. Approximately half the students had directly employed an approach they'd experienced as part of the module – storytelling - adapting a story they had experienced during the demonstration phase to bring Victorian working children to life for the pupils.

The student semester ended before the students' teaching practice, so we had no formal opportunity for review; however students provided individual verbal feedback when they returned borrowed resources. This review process is one that I shall try to build into my teaching whenever timetabling allows.

In both cases, the students had had the confidence to try out the approaches. More importantly, they had proved successful.

The demonstration, modelling, implementation and review process the students went through has strong parallels with Kolb's (1984) experiential learning model, where learning

involves a cycle of: concrete experience; observations/reflections; formation of concepts and generalisations; active experimentation.

Student Satisfaction and Learning

Evaluations for both modules were extremely positive. For the Year 4 module, all the student evaluations cited the lessons as particularly useful: e.g. 'Modelled lessons that illustrated how to teach particular areas'

Of additional comments about the modules as a whole, two stand out:

'Thoroughly enjoyed module very beneficial for future career.' (Yr. 4)

'A module like this should be included in either Y1 or Y2 because until this module I did not feel like I was a specialist in history but now I've gained a wealth of knowledge about effective history planning and cannot wait to try it out on my next placement. Thank you for such an excellent and enjoyable module.' (Yr 3)

These students clearly felt their needs had been met through the authentic contextualised activities (the lessons) that formed an intrinsic part of the teaching. We clearly need more extensive and systematic research into the cognitive apprenticeship model, but the initial results indicate that for student teachers cognitive apprenticeship is a fruitful teaching and learning approach.

There are implications for tutors; in vocational fields such as teaching, university tutors need to keep their workplace knowledge and skills fresh and sharp. In the 1990s the Government introduced a requirement that teacher educators have recent and relevant experience in schools; however, this (as with so many initiatives) has lapsed. If a cognitive apprenticeship approach is embraced, the implication is that tutors should have current workplace experience and that this would benefit both them and their students.

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