Supporting students on placement: developing observational skills using mobile technology

Abstract

Trainee teachers spend only a fraction of their course time in university with the majority of the year (120 days) spent in placement schools. Therefore, there is always the need to maintain close links with trainees and to enable them to link the theory learned at university to their practice in the classroom.

A key aspect of developing as a practitioner is learning from experts in the field, known as cognitive apprenticeship (Collins, 2006). Our trainees spend most of their time at the beginning of their placement observing and taking notes while observing experienced teachers delivering lessons. Training is needed to gain the maximum amount from observation (Borich, 2011) and mobile technology can help in providing some scaffolding to this training. Mobile technology has many uses in education and we describe a bespoke mobile application we have developed called Standards Tag to enable trainee teachers to tag key events observed in the classroom. The application has two major features: audio clips for key theoretical concepts behind aspects of teaching and learning, linked to the Teacher Standards (DfE, 2013); and a tag feature for noticed observations which are then sent by email to the student's email address.

Keywords

mobile technology, initial teacher education, situational learning, professional vision

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Introduction

Trainee teachers studying towards a Postgraduate Certificate in Education (PGCE) spend only a fraction of their course time in university with the majority of the year (120 days) spent in placement schools. A key underlying principle of the programme is to maintain close links with trainees whilst away from the university and to enable them to link the theory learned at university to their practice in the classroom. In this context we are always striving to facilitate the embedding of skills and knowledge developed at university whilst on placement. This has led us to develop a mobile application which will enable trainee teachers to develop their professional vision and enhance their ability to link theory to practice.

In this paper we firstly look at the theoretical basis for the learning that takes place on placement, including issues around narrowing the gap between theory and practice for trainees. We then look at how mobile technology has been used to address some of these issues, and the relevance of mobile technology to education. We then discuss our particular context and how we feel that using smartphones could help to enhance early placement-based learning and skills development.

Situated learning: Learning whilst on placement

A key aspect of developing as a practitioner is learning from experts in the field, known as cognitive apprenticeship (Collins, 2006). In teacher training, this learning takes place in the context in which the new skills will be used and this learning can be said to be situated (Lave and Wenger, 1991). Hayslett *et al.* (2009) contrasted this type of learning with a traditional apprenticeship where the apprentice observes, is coached and then practices the skills. However, it is important to stress that teacher training is more than just an apprenticeship; the trainees have two types of learning – placement and university – and they need help with closing the gap between theory and practice. Korthagen (2010), writing about the Netherlands, points to the fact that there is a significant gap between theories of education delivered in university and practice in schools, and argues that a better understanding of the processes of situated learning will help us to provide structure for trainees to help them. Korthagen suggests that 'much of the theory presented to teachers in teacher education programs is seldom used in practice, even after all kinds of sophisticated pedagogical measures have been taken' (2010, p.103) and proposes a model which 'points to the need of a follow-up in the form of sufficient practical experiences in which the theory is consciously used' (*ibid.*, p.105)

Seezink, Poell and Kirschner (2009) described four dimensions to cognitive apprenticeships:

1. Content – where it is important for the trainee teacher to be able to differentiate between different types of knowledge.

2. Method – aligning with the traditional model of apprenticeships, where trainee teachers are provided with guidelines for teaching methods.

3. Sequence – providing opportunities to observe, engage in and discover expert strategies.

4. Sociology – this is key to the trainee teacher becoming part of the community of practitioners (2009, p. 204).

These four dimensions reflect the different aspects of teacher training, with the presentation of ideas and concepts regarding pedagogy and learning, the discussion of the different approaches and situations that arise in the classroom, the actual development of teaching skills with careful supervision and monitoring, and developing the trainees' understanding of and inclusion within the culture of the profession. The design of our learning app is seen as an important tool in helping with this development. It will also assist in closing the gap between the university-based and school-based aspects of the training.

Professional Vision

Balli (2011) discusses how trainee teachers are able to call on their own memories of school experiences to help them to reflect on what they observe in the classroom. This is helpful as a starting point but we propose that it is also important to develop our students' noticing and observational skills. We believe that this should take place in addition to encouraging teachers to become reflective practitioners (Pollard, 2011), which is standard practice in teacher education. Goodwin (1994) first proposed the field of professional vision, defining it as 'socially organized ways of seeing and understanding events that are

answerable to the distinctive interests of a particular social group' (1994, p. 606) and this is an area which has proved of interest to educational researchers.

The concepts of professional vision can easily be translated to teachers' work in the classroom and there are many examples of work in this area. Sherin (2005) begins her discussion of professional vision in the classroom with this example:

> Imagine that you are standing at the site of an archaeological dig. On your left, you see a large rock with a dent in the middle. Next to it you see a pile of smaller stones. Aside from all this, all you see is sand. An archaeologist soon appears at the site. What looked like just a rock to you, he recognizes as the base of a column; the small stones, a set of architectural fragments. And where you saw only sand, he begins to visualize the structure that stood here years before (2005, p. 75)

Stürmer, Könings and Seidel (2012) are clear that professional vision is a skill that experienced teachers have but which trainee teachers can gain in a directed university-based teacher training course. In their study, Stürmer, Könings and Seidel used videos of teaching to develop professional vision in a directed and knowledge-guided way; we believe we can also do this but by maximizing the impact of the period of time that trainees spend in initial observations of expert teachers.

Thus, with the overall goal of supporting the development of professional vision in our trainee teachers within the context of a cognitive apprenticeship framework, we propose a new and exciting way to achieve this, by utilizing mobile technology. In the next section we outline why we feel that mobile technology has much to offer teacher education.

Mobile technology and teacher education

Pachler *et al.* (2010) argue that mobile devices have a number of important characteristics which make them attractive from an educational perspective, including increasing portability, functionality, multimedia convergence, ubiquity, personal ownership, social interactivity, context sensitivity, location awareness, connectivity and personalisation. In the UK, the OFCOM report (2013) highlights the growth of mobile for everyday use, there are currently 82.7 million mobile subscribers in the UK. In 2000, 56% of adults had a mobile phone – it is now 94%. The increased use of Smartphones, individual devices for accessing the internet is rapidly increasing – in 2012, over 40 million subscribers accessed the internet via their mobile phones, an increase of nearly 9 million since 2011.

As the JISC Google Generation project discovered, young people may be adept users of technology for social interaction, but not necessarily for learning (JISC, 2013). These findings were reflected in the work of Bradley and Holley (2011) which tracked students' mobile technology use in a five-year longitudinal study. Their work indicated that all students possessed a mobile phone for individual use, and student feedback indicated that they are keen to use their mobile phones for study. The students expected academics to be leading in assisting them to exploit the affordances of learning on the move, and this leadership was not forthcoming (Bradley & Holley, *op.cit*). Kukulska-Hulme *et al.* (2011) suggest that mobile technologies will not necessarily be readily adopted for learning, and that there are a variety of barriers to adoption citing ergonomic, pedagogical, psychological and environmental factors and the issue of cost.

Holley, Sentance and Bradley (2011) reported on a one-year ESCalate-funded SMS texting project undertaken with PGCE trainee teachers, supporting trainees in school to engage with their studies by scaffolding their learning around critical reading at Masters level. The project met with limited success, mainly because of some technological restrictions which did not easily enable trainees to share their reflections with their small group peers. However, the personalization of the mobile / SMS approach was valued, which has led us to our current work to create a bespoke application to assist with an aspect of classroom practice, and to strive to overcome some of the challenges identified by Kukulska-Hulme *et al.* (2011).

Our context: pre-service teachers in school
Background to Teacher Education
Trainee secondary school teachers at Anglia Ruskin University are enrolled on a Postgraduate Certificate of Education (PGCE) course. This is a one-year intensive course which is run as a partnership between schools and the university, including a minimum of 120 days spent in schools. The course is developed so

that the university- and school-based aspects complement each other which enables the trainees to become effective and confident teachers. While on their school placements, the trainee teachers carry out the role of a normal teacher, though beginning with only six hours of teaching per week (the equivalent of 30% of a normal teacher's timetable) and rising to 13 hours teaching each week (equivalent to 60% of a teacher's timetable). During this time, the trainees work closely with a school-based mentor, with timetabled meetings taking place on a weekly basis, together with other informal opportunities for guidance, advice and target setting and review.

At the beginning of each placement, particularly the first one, trainees spend most of their time observing and taking notes while observing experienced teachers delivering lessons. Training is needed to gain the maximum amount from observation (Borich, 2011). Trainees are essentially involved in legitimate peripheral participation (Lave and Wenger, 1991) during this process as they can learn a great deal from the experience of other expert staff.

During their placements, trainee teachers need to gain evidence that they have met eight Teacher Standards (DfE, 2013) which outline the essential standards for the teaching profession. By the end of the year, trainees should have their own evidence of having met these standards, but at the beginning of the year, they need to become familiar with the standards and find out how experienced teachers meet these standards. The Standards Tag app is therefore built around the premise that if all trainees can see other teachers demonstrating how the standards can be met, it will be easier for them to meet these standards themselves.

Standards Tag – developing observational skills in context
Design decisions
In developing the mobile application for trainee teachers we first commissioned a report on the various development platforms that might be suitable for our purposes. At this stage we established that our application should have the following features:

- It should be available on a number of different platforms, not just for one kind of mobile phone.

- It should be able to play audio clips, which, although not as memory dependent as video, would be bound to increase the size of the app when being downloaded on to a phone.

- It should have an email feature, whereby emails could be sent to different email addresses, depending on the user; this is a different requirement from just having the app always email to the same email address.

We considered a number of environments for app development and settled on the use of *Application Craft* (Application Craft Ltd., 2013), which works on top of the *Phone Gap* (Adobe Systems Inc., 2013) development platform, to create apps which can be utilized both as web-based apps and native apps. A native app is downloaded to a phone from a application store and installed on a phone; a web-based app is a website that has been customized to be viewed on a mobile phone.

In then developing the app, we needed to consider the differences between developing for a phone size screen (which can be quite variable) in contrast to developing a software application for a typical desktop or laptop with a larger screen size. The issues we had to consider are very neatly summarized by Gordon (2013):

> Cross-platform development adds complexity to developing robust software. Issues that add to this complexity include designing for multiple platforms and testing and debugging. How do you make sure an application will run on different devices with different screen sizes, different operating system versions, and/or in different locations? For voice input, how do make sure an application will work with a wide range of speakers? How do you test location-based behaviour for a wide variety of locations and location types (outdoors, indoors, in the mountains, around tall buildings, and so on)? (2013, p. 60)

When designing the user interface, we had to consider a range of issues including choice of font size, icons, and quantity of information on each screen. We potentially had a lot of information to display on the screen and yet we did not want the user (the student) to need to click through several screens of data to get to the information that was most useful to them. On the other hand, the information has to be easily readable, even on the smallest size smart phone.

Development of Standards Tag

The application has two major features:

1. Audio clips to deliver key theoretical concepts behind aspects of teaching and learning, linked to the Teacher Standards;

2. A tag feature for noticed observations which are then sent by email to the student's email address.

The application can be downloaded as a native application or a web-based application. Thus far we have focused on developing the native application facility for both the Android operating system and for Apple iOS. The number of platforms will hopefully grow but any phone users can use Standards Tag as a web application on their smart phones.

The initial screen is shown in Figure 1 in *Application Craft* and in Figure 2 on an example phone.

Figure 1: Main menu screen

Figure 2: The app displayed on an Android phone

The user can then select a Teacher Standard. There are eight Part I Teacher Standards as follows:

1. Set high expectations which inspire, motivate and challenge pupils
2. Promote good progress and outcomes by pupils
3. Demonstrate good subject and curriculum knowledge
4. Plan and teach well-structured lessons
5. Adapt teaching to respond to the strengths and needs of all pupils
6. Make accurate and productive use of assessment
7. Manage behaviour effectively to ensure a good and safe learning environment
8. Fulfil wider professional responsibilities (DfE, 2013)

We have mapped these to the following themes in our application:

1. Motivation
2. Learning
3. Understanding
4. Planning
5. Inclusion
6. Assessment
7. Behaviour
8. Professional attributes

The themes also link to a teaching module entitled Theories, Themes and Issues, which is taken by all PGCE trainees, whether training to be secondary or primary teachers.

In the first part of the system, the student may select a Standard on the touch screen and then be able to listen to a video clip (see Figure 3).
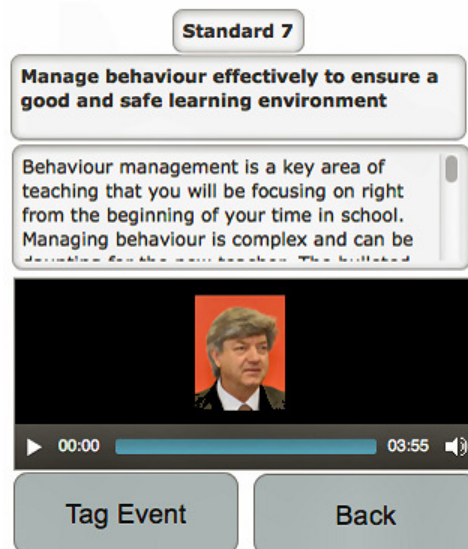

Figure 3 Main screen for each Teacher Standard showing audio clip

In the second phase of using the system, the student may be observing a lesson and may then press Tag Event and choose which Standard to tag (see Figure 4). The student then selects points about the observation s/he has made and then presses 'Send' to keep a record of the event. The details of the event are then emailed to the student (see Figure 5), for them to review later (i.e. in a university session, or a session with a school mentor, or during planning of an assignment).
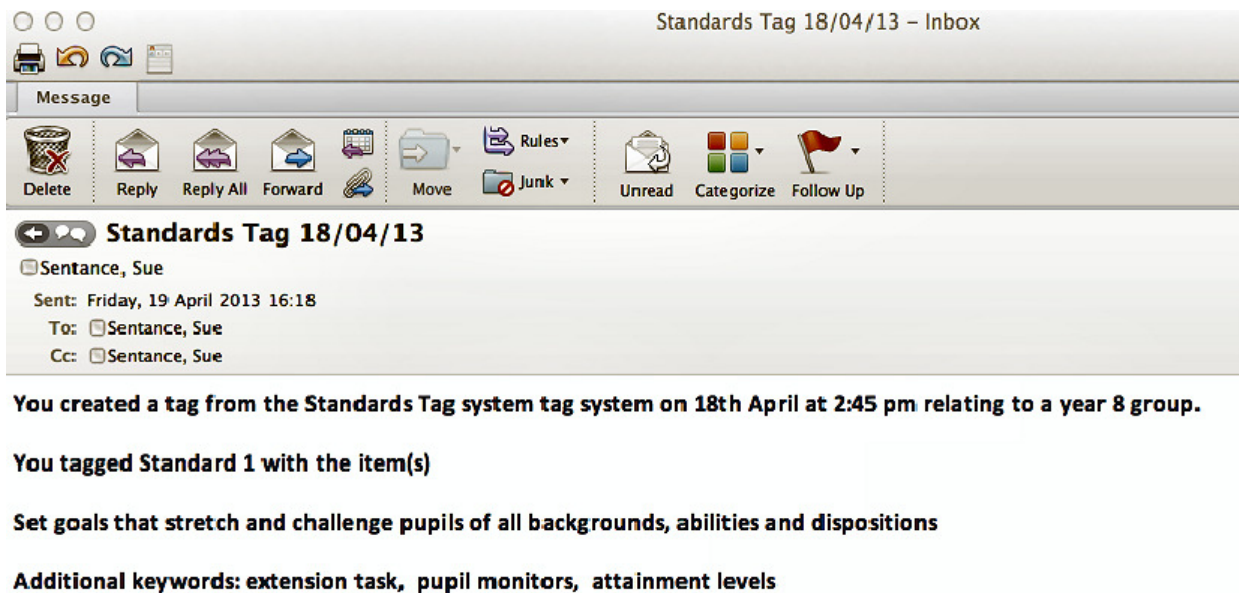
Figure 4: 'Tag Event' screen

Figure 5: Sample email sent by system

The system has been implemented but not yet evaluated. Evaluation will take place in the autumn of 2013 with 200-250 primary and secondary trainee teachers at the beginning of their post-graduate training.

Conclusion

Mobile technology has been employed for two learning purposes: reinforcement of academic work on the move, and enhancing professional vision in novices.

As well as scaffolding observational skills, this mobile application has advantages with respect to other aspects of trainee learning, including the direct exposition of the Teacher Standards, the primary assessment measure for qualified teacher status. In addition we believe this tool has wider application, such as for the retraining / upskilling of qualified teachers, and also for any placement-based education such as health and social services, as the underlying concepts could be adapted to other teaching domains where there is a need to link theory to practice.

We feel this will be useful to enhance the quality of experiences our students have whilst on placement. It may be that our experiences with the app encourage us to spend more time with them in university focused on narrowing the gap between theory and practice (Korthagen, 2010) and developing professional vision explicitly (Stürmer, Könings & Seidel, 2012); in which case the development process we have been through will feed into a further improvement of our provision for our trainees.

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