Student Teachers' Experiences and Attitudes Towards Using Interactive Whiteboards in the Teaching and Learning of Young Children

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Abstract

Students pursuing a one-year postgraduate teacher education course are required to make rapid changes in their ideas about teaching and learning during their preparation to be elementary teachers. This is particularly necessary in the case of Information and Communication Technology (ICT).

This paper focuses on one particular aspect of ICT in the classroom: the interactive whiteboard. It examines student teachers' reports of provision and use in placement schools and analyses their responses to attitude surveys. It also compares attitudes between groups of student teachers working with early years and upper primary classes.

Preliminary findings indicate broad similarities in the attitudes and aspirations of the two cohorts, in contrast to the differences in extent of use observed in the Early Years and Upper Primary groups. Student teachers are highly enthusiastic and see the boards as an important feature of teaching and learning. They are prepared to spend extra time in practising with the technology and preparing resources in order to exploit the interactive features which they have seen engage the children.

The initial education and training of teachers is helping develop understanding of the potential of interactive whiteboard technology for teachers and children, particularly in the early years of schooling.

Keywords: elementary education, learning environments, teacher education.

1   Introduction

During recent years, teachers in England and Wales have been encouraged to increase the amount of whole class interaction in their teaching of young children with the aim of improving standards of attainment, particularly in basic skills such as literacy and numeracy.

> … better numeracy standards occur when teachers … devote a high proportion of lesson time to direct teaching of whole classes and groups, making judicious use of textbooks, worksheets and ICT resources to support teaching, not replace it.
> (Department for Education and Employment 1999)

This drive initially appeared to be in conflict with a more general focus for ICT resources on the development both of ICT skills and of greater autonomy in learning. There is now evidence, however, that ICT can enhance further the positive features of whole class teaching, particularly for young children (Smith 2002). The device which seems to have been most effective in this respect is the interactive whiteboard.

An interactive whiteboard (IWB) is a large touch-sensitive display panel that can function as an ordinary whiteboard, a projector screen, an electronic copy board or as a computer projector screen on which the computer image can be controlled by touching the surface of the panel instead of using a mouse or keyboard. The technology allows the user to write or draw on the surface, print the image off, save it to computer, or distribute it over a network. The user can also project a computer screen image onto the surface and then control the application either by touching the board directly or by using a special pen. The computer image can be annotated or drawn over, and the annotations saved.

Interactive whiteboards can be used purely as presentation devices. This feature alone is valuable in motivating pupils (Glover and Miller 2002a), but for presentation purposes a desktop/notebook PC attached to a data projector does as well at rather less cost.

From a pedagogical perspective, there are a number of key features of interactive whiteboards which take their role beyond mere display:

> their interactivity, which facilitates active learning, not just passive reception of information;
>
> their size, which facilitates collaborative group working;
>
> their accessibility for all learners but especially young children and those with a visual or physical impairment;
>
> their recordability, so that any end product can be stored for subsequent re-use, or deconstructed to analyse a process.
> (Glover and Miller 2002a, Smith 2002, Wood, 2001)

In order to exploit all the features of these devices whilst interacting with a class, teachers need to develop a number of new techniques to reach automaticity and to gain an understanding of the role of their features in teaching and learning (Smith 2002, Glover and Miller 2002a, Warren 2003). These are not trivial matters to learn, and the introduction of the boards inevitably stimulates a need for investment in training, time to prepare resources, the mutual support of colleagues, and the permanent availability of a board in each teacher's classroom (Glover and Miller 2002a).

2   Policy Initiatives in Wales

In January 2002, the Welsh Assembly Government, announced details of spending plans for a £9.9 million grant to provide interactive whiteboard and multimedia equipment for every school in Wales.

> Interactive whiteboards open up whole new ways of using ICT to support teaching and learning. They provide a high quality presentation tool which teachers can use for whole-class teaching and to encourage pupils to engage with ICT. They also make it easier for groups of pupils to work collaboratively on projects using ICT… Providing the equipment is of course just the start of the story. It is important to ensure that training is provided to give teachers the skills and confidence to make use of this exciting new technology.
>
> (Davidson 2002.)

Of course, it is not only teachers currently working in schools who have needs for ICT skills development. Student teachers pursuing a one-year PGCE course to gain Qualified Teacher Status in Wales are required to meet a number of standards (Department for Education and Skills 1998) with regard to teaching and learning with ICT in order to attain qualified teacher status. The course includes a specific ICT programme which aims to develop their ICT skills and their understanding of how to employ them effectively in teaching and learning. As a result of this programme, and their previous experience with ICT, they are often more confident with ICT than their more experienced mentors (Galanouli and McNair 2001).

In response to provision of interactive whiteboards in partner schools, the University of Wales Swansea's Department of Education has used Welsh Assembly Government funds for ICT in Initial Education and Training to install interactive whiteboards in teaching rooms used by student teachers and has encouraged their tutors in university and school to help student teachers develop awareness and familiarity with the medium.

3   Research Carried Out

In order to investigate the effects of IWB provision in the University and partner elementary schools, surveys were undertaken as part of the delivery of the ICT component of the Primary PGCE course using the virtual learning environment Blackboard. The surveys allowed the student teachers to comment on the provision and use in schools and their own attitudes to the technology. The surveys were submitted during their initial observational placement (OP), and after their first assessed school placement (ASP1).

The effects of the Government policies and school practices on the elementary teachers of the future were explored through:

> the reports of initial classroom observations and after their first assessed school placement;
>
> the student teachers' developing practice during their first and second assessed school placement;
>
> the responses to attitude surveys which the student teachers completed;
> student teachers' choice of resource preparation task.

The student teachers on the primary PGCE course choose between specialising at Upper Primary Level (UP: age range 7–11) and Early Years (EY: age range 3–8). We consider the similarities and differences in attitudes between the two groups (43 EY, 50 UP student teachers).

3.1   ICT Skills

There was no significant difference between the ICT skill levels of the two groups when measured against the TTA standards, either during an initial ICT skills audit undertaken September 2002 or a final ICT skills audit undertaken March 2003. Figure 1 illustrates how the two groups shifted in their perception of their competence as a result of the course.
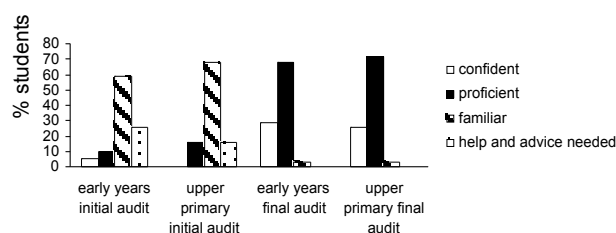

Figure 1: ICT Skill Levels of Student Teachers

3.2   Provision and Use of IWBs by Teachers

Clearly the Welsh office initiative to install multimedia equipment into every school has been well implemented with 100% of all student teachers reporting the presence of an IWB during OP and ASP1 in their teaching placement schools. However, at the time of the student teachers' initial observational placement, 18% of IWBs in infant schools and 8% of those in junior schools were not functional.

Overall 52% of student teachers observed the IWB being used during OP. However, only 40% of early years student teachers observed any use of the IWB as opposed to 65% of upper primary student teachers, which is a significant difference ($P<0.001$). The results for observing the whiteboard during ASP1 are similar: 40% of early years student teachers compared to 70% of upper primary student teachers observed teaching using the IWB (see Figure 2).
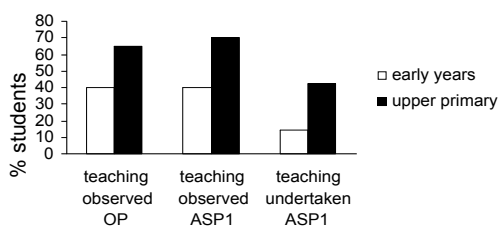
Figure 2: Comparison of Teaching Observed and Teaching Undertaken

A much smaller proportion, 26% of early years and 45% of upper primary student teachers, had access to an Interactive Whiteboard for teaching whilst on ASP1, again a significant difference between the groups ($P<0.001$). This lack of access had a negative effect on the many student teachers, particularly in the Early Years group, who did not see any models of their use.

When I first arrived at my ASP1 the whiteboard was sitting in the staff room——it had not been used or set up. A home was found for it in the hall where it was placed behind the dining tables! Teachers were not keen to use it - it was too tall for the children and I did not see it being used. (EY)

As I was in the nursery on my ASP1 there wasn't any opportunity to use an interactive whiteboard and I don't think there was any interactive whiteboards in any of the early years classes. (EY)

3.3   Training and Use by Student Teachers

The amount of training with the IWB received whilst on placement in schools was similar for both groups with only 44% of student teachers receiving any training whilst on school placement either of a formal or informal nature. There was no significant difference between the upper primary and early years groups in respect to the training they received whilst on OP or ASP1.

Data collected on teaching undertaken by student teachers (see Figure 2) shows significantly fewer (14%) of early years student teachers using the IWB during their lessons compared to upper primary student teachers (42%) during ASP1 ($P<0.001$). On the ASP1 only 13% of student teachers had an IWB in their class, but this was 9% of early years student teachers compared to 18% of upper primary student teachers, which is a significant difference ($P<0.001$). This suggests that more use is being made of the technology with the seven to eleven year olds than with younger children, although it is not clear why this was the case.

The majority of student teachers received little assistance in using the whiteboard in schools, although several took the initiative in developing their skills and trying it out in the classroom when they had the chance. They clearly expected to be prepared more specifically for using IWBs during the University part of the course.

I'm pleased that I managed to incorporate the interactive whiteboard into several of my lessons and pleased with some of the resources that I

developed for use on the whiteboard…. I can see the enormous potential that this resource has but wish that we could receive more specific training on it. (UP)

3.4   Use by Pupils

Student teachers who had observed teaching on OP and ASP1 were asked if, during their observation of lessons, the children had hands-on experience of working with the whiteboard. There was a consistent response of around 70% of student teachers from both groups who had observed pupil use. Touching the boards seemed to be particularly important for younger children, although this point had not been recognised by the designers!

During my ASP I taught on the interactive white board for an hour every week. The use was for our benefit and also for the children to become used to the new technology. The children in my reception class really enjoyed their sessions on the board and were very confident using it. I feel that the use of the white board has increased my confidence in using it again. (EY)

I did attend a formal training session on using the white board. The teachers discussed where it should be placed at the school and decided it should be placed in the hall, but before they could do this they would need to shorten the legs on the board (as they were not adjustable) in order for the children to be able to use it. (EY)

3.5   Student Teacher Attitudes

Attitudes are broadly similar for both groups. All student teachers feel that an IWB is either useful to have available, essential for certain topics or essential for all teaching. The student teachers were clearly very positive about the IWB with 97% answering yes to the question 'Would you choose to have an IWB in your classroom?', even though 76% of student teachers felt that it would increase their preparation time a little or a lot. This can only be explained in terms of their perceptions that IWBs improve standards in the classroom and increase motivation. 90% of both groups who had *observed* lessons felt that the IWB had added value to those lessons. 95% of student teachers who had *taught* using the IWB felt that the IWB had added value to those lessons.

However, over 90% would not make its presence or absence in their classroom an issue when accepting their first teaching post. Most feel that getting a job is the most important factor. Student teachers were specifically asked about the effects of preparation time, and showed a variety of levels of awareness of this issue:

It would increase preparation time as I have no idea how to set up interactive programs on the whiteboard. In most schools there is also the need to get the whiteboard out of the cupboard, calibrate etc. (EY)

It would decrease my lesson preparation time slightly as I would be able to pull things up on the

board and not have to plan them on a normal whiteboard. It would also allow me to save things for use later in another session. (UP)

Because I spend lots of time making resources anyway, and it would only mean spending time searching for them on the interactive whiteboard. I also think the lesson would be improved quite a lot, so I would not mind spending extra time preparing the lesson if I needed to. (EY)

Most student teachers were aware of the need to prepare resources in advance in order to utilise the IWB effectively. Those who had thought through the implications felt that they would spend a lot of time on resource preparation in their first years of teaching anyway, and that if they used ICT it would make their task easier in the longer term because of the re-usability and adaptability of the resources.

3.6   Software Selected for ICT Challenge

At the end of their ICT course and as part of their assessed portfolio of work for the Primary PGCE course, student teachers are set the task of creating a practical teaching resource for use in the classroom using ICT. The choice of software is left to the individual student teacher. It is envisaged that at least two working days are allocated to this project and so it is a considerable investment in terms of the student teacher's time. The student teachers are guided to choose to work within a software package that will be of use to them in their future teaching careers. There was a significant difference ($P<0.001$) between the number of upper primary student teachers (42%) and early years student teachers (18%) who chose to familiarise themselves with and make use of the available IWB software (*ACTIVstudio*) for this project (see Figure 3).
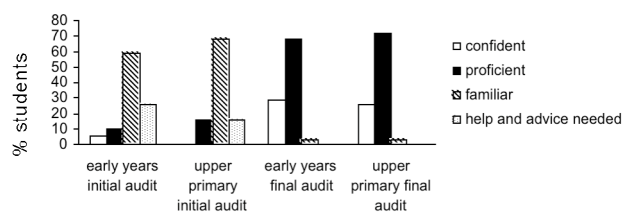
Figure 3: Software Chosen for ICT Project

In both groups, over 85% of student teachers anticipated needing support with the technology in their first year of teaching. When questioned about the form they would prefer professional development to take, the responses were broadly similar for both groups (see Figure 4).

Figure 4: The Form that Student Teachers Would Like Future CPD with IWB to Take

4   Conclusion

Our preliminary findings indicate broad similarities in the attitudes and aspirations of the two cohorts of student teachers. It seems that future teachers recognise the potential value of using interactive whiteboard technology for and by children, despite only limited experience with the medium themselves.

Whilst most experienced teachers take some time and practice before they are convinced of the value of IWBs (Glover and Miller 2002a, b), student teachers predominantly see them as an important feature of their future teaching. They are less concerned about extra preparation time as they see ICT as a natural part of their work. This technology will not be their highest priority when seeking a post or establishing their practice in the classroom, however. Despite the best efforts of initial teacher education, greater commitment to technical support and professional development may be needed before teachers are able to exploit IWBs fully.

It seems that the provision of IWBs in all schools is currently having a limited impact on the education of children, and that the extent of use of the technology differs according to age group. There is evidence, however, that the initial education and training of teachers is helping to develop understanding of the potential of interactive whiteboard technology for teachers and children, and is likely to increase the demand for use in the early years.

Since the survey of student teachers indicates so strongly their need for modelling, training and practice prior to school placement, the University has equipped all its teaching rooms with IWBs and given one of the authors time to develop her skills to a high level and to provide training for other tutors. Future student teachers, their supervising teachers, and the pupils in our partnership schools, will gain the benefits and help us evaluate the effects of this large investment.

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