Collaborative learning in a Primary School ICT Suite

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Abstract

Jill Jones was a member of the very first cohort of the Herts. MEd in Teaching and Learning. When she graduated in 2001 she was the Deputy Head at Four Swannes Primary School but has since been appointed to the Headship. This article provides an account of her investigation into the use of the ICT Suite in her school and the teaching strategies that seemed to be most effective in that context.

Introduction

I had always assumed that pupils perform better when using a computer because they seem to enjoy it, but I had begun to question whether enjoyment was a sufficient indicator of successful learning. The question I had to ask was: does using a computer actually raise standards of achievement and if so how can this be maximised?

My school is situated in an urban area of Hertfordshire and provides for children from a low socio-economic background. The percentage of children on free school meals is above the national average, attainment on entry for the majority of children is below national expectations and there are a number of children from ethnic minority groupings with English as a second language. It is into this setting that a computer suite was introduced. As a Senior Management Team we were confident that the ICT Suite would contribute to raising standards but seven months in we wanted to know whether it was having any impact on the teaching and learning within the school. My research project would help us to address this. I was keen to know why teachers take their pupils into the suite and what they do there. I wanted to know whether it moves pupils' learning forward and whether we could develop school wide strategies for using the suite to improve our teaching.

At an initial staff meeting we discussed the issues arising from an audit of practice by questionnaire. As a result of these discussions I decided to concentrate on the specific areas of English and Mathematics. In English, I would look at the use of the Internet as a research tool to aid skimming, scanning and note-taking skills. In Mathematics, I would look at data handling and the skills associated with using graphs.

I was keen to involve my colleagues so as to develop practice in the school; I met regularly with the Headteacher and the Key Stage 1 teacher whose Year 2 children I would be observing and recording. I also consulted with all of the pupils to be involved in the project.

The use of computers in schools

Computers are now such a familiar part of everyday life that it is hard to imagine a time without them, but in the early 1980s they were unfamiliar to teachers. In the 1980s Riding sought to encourage teachers to embrace the new technology, describing the attitude of many teachers as:

> ...either one of bewilderment, or fear, or that the computer is yet another seven day wonder, which if ignored will go away.
>
> (Riding, 1984:1)

Even though virtually every primary school classroom had at least one computer in 2000, our staff questionnaire highlighted colleagues' lack of confidence.

In January 2001 a BECTA (British Educational Communications and Technology Agency) report described the extent of the investment in ICT infrastructure in primary schools and seemed to suggest a clear link between the use of ICT and improved standards of attainment.

> The better the ICT rating of a primary school, the more likely it is to be amongst above average schools for national tests in Mathematics. Statistically, there is a significant positive correlation between the schools' Ofsted ICT resource grade and their grade for Key Stage 2 Mathematics.
>
> (BECTA, 2001:6)

Correlation should not be taken to imply causation; nevertheless I found the BECTA report encouraging. I asked myself similar questions to those raised in the report: questions about the impact of ICT on standards, about colleagues' perceptions of the efficacy of ICT in their work, and about the impact on teaching and learning in Maths and English. As these questions developed it became clear that it is not always the computer provision that is important but how it is integrated into the curriculum. Therefore, when seeking to explore the use of the ICT Suite I was keen to see what previous research has to say about the pedagogy teachers employ, particularly in English and Mathematics.

In the early 1990s the National Association for the Teaching of English (NATE) advised that computers could contribute to the development of speaking and listening, reading and writing. Straker and Govier (1997) suggested that, when working in pairs or small groups, children could be encouraged to talk about their activity.

> One of the most impressive aspects of the use of the computer in the primary classroom is the amount of talk generated. When three or four children are sitting around a computer they have a natural focus for their talk, which encourages listening, reflection and participation.
>
> (Straker & Govier, 1997:128)

Because listening, participation and reflection are very important parts of the learning process, the level of talk and collaboration emerged as important dimensions in my project. When using the computer children are faced with many decisions. They might choose which websites to visit and what information to record. Straker and Govier (1997) outline a number of skills that children gain when problem solving and investigating with computers.

> Problem solving skills – deciding upon identifying a problem; planning strategies, carrying them out, and recognising when they are successful and when they are not.

> Investigational skills – asking questions and deciding which ones to pursue; recognising patterns and relationships.

> Reasoning skills – reasoning logically; drawing inferences; deducing new information from existing information; describing and explaining methods, reasons, strategies, predictions, results or conclusions.
>
> (Straker & Govier, 1997:71)

I attempted to structure my observations and questioning around some of these areas.

I was also seeking to see if the ICT Suite had any influence on raising standards in Mathematics. Our questionnaire for staff indicated that there was scope for development; whilst most teachers were ready to explore word processing and perhaps the Internet, there was not the same eagerness to use Mathematics programmes. Arguments for the use of computers in Mathematics emphasise the idea that the technology should complement rather than replace traditional teaching strategies (Ainley, 1996). Again the idea that the use of computers could be an aid to collaboration was suggested. There is evidence that where pupils are using computers, working in pairs and small groups enhances performance (Light, Littlejohn, Messer & Johnson, 1996). There is also evidence to support the argument that children find it easier to work collaboratively when working on computer tasks than when they are working on standard classroom tasks, provided that these tasks involve the opportunity for collaboration.

> Computers can support, and are supporting a range of teaching and learning styles. This renewed focus on the role of social interaction has led to an increasing interest in collaborative and co-operative learning and new technologies can be a key to such social interaction.
>
> (Underwood & Underwood, 1999:11)

For our ICT Suite to be effective in raising standards there was a need for the children to work collaboratively on tasks that encouraged this.

In order to evaluate strategies I would need to focus on:

- the task given by the teacher
- the level of teacher input / explanation
- the groupings of children – gender, ability, age, behavioural factors etc.
- the kind of talk pupils engage in whilst doing the activity
- the pupils' perspective on the activity

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- the teachers' perspective on the activity
- the quality of the work completed compared to that arising from classroom work without the use of a computer

The process of inquiry and development

Much of the data I collected would be of a qualitative nature including observations, questionnaires, interviews and the sampling of pupils' work. I paid attention to the guidance I read in Hitchcock and Hughes (1995) and Silverman (2000). I did most of the data gathering myself but employed a research assistant for a total of three days. I asked her to observe pairs of Year 2 and Year 6 pupils whilst I would only observe pairs of Year 2 pupils. The reason for this was that I was the Year 6 teacher and I did not want to influence their responses. Also our interpretations could be assessed from different points of view.

Observations

The observations focussed on five pairs of pupils in both Year 2 and Year 6 classes. The composition of the pairs was quite experimental; some of the pairs had mixed genders; some were the same gender; some had pupils of similar ability levels and some had quite different ability levels. I carried out a pilot observation with the purpose of deciding how best to observe pairs working on a computer. No pupil was observed twice during the study and all except the pilot observation was followed up with an interview.

Interviews

The interviews were conducted as soon as possible after the observations, their purpose being to ascertain how the children perceived they had fared in the task they were set and how they had worked 'together'. Of the four interviews, I conducted one and my research assistant conducted the other three. Therefore my researcher interviewed all Year 6 pupils and one Year 2 pairing. I observed and interviewed two Year 2 pairings including the pilot observation. I felt it was important that whoever did the observation also carried out the interview, as they were best placed to address any issues or points that might arise.

The children were asked the same set of questions with minor alterations where appropriate e.g. name of teacher, relevant task. This was so that some comparisons could be made in the analysis and to gain some consistency as two people were conducting the interviews. All interviews were taped with the exception of one where the tape recorder failed.

Samples of pupils' work

Samples of children's work were taken to ascertain the nature and quality of their 'normal' classroom work in data handling and research methods, skimming, scanning and note taking. Then I looked at a sample of work they had done in the ICT Suite, under observation. Any comparisons or issues were then raised with the class teacher. As I was one of the class teachers, this was discussed within the internal analysis group of Headteacher, Year 2 teacher and myself.

Data analysis and issues

I developed a set of categories as a lens or filter to hold up against the data. I started with the question – 'In what ways does collaboration play an influential part in learning when using computers?' As I read through the data I generated the analytic codes through an inductive process – identifying a pattern of themes and then going back to the data to try them out, refining the categories as I went. The codes I eventually settled upon are as follows.

AC   active co-operation/joint decision making/genuine working together

IA   independent action/no partner input

DT   directing the task, taking control of where they wanted the task to go

NP   non participation/off task behaviour

CT   compliance with partners' actions regarding the task, usually occurring as a direct opposite of their partners DT

This analysis enabled me to gain insight, for example into the way pupils responded to the challenge of collaboration in the ICT Suite and the way they responded to the tasks set for them.

Collaboration seems to be valuable in itself although there seems to be a tension between what the pupils say about that and what the observations told me about their behaviour. All of the pairs agreed in the interviews that they had worked together and that they had helped each other. This was contradicted by what had been observed for example in the Year 6 pairing where Sam had clearly taken the lead in the task and Samantha had either unintentionally or deliberately opted out, playing what appeared to be a subservient role. The younger Year 2 pupils seemed to be actively collaborating at some level but the extent to which they were actually 'working together' as opposed to 'working alongside each other' is questionable. Bowman (1996) found similar responses from children when invited to comment about working together. The children's expressed view is that they preferred the group activity to writing alone, and despite observational evidence to the contrary, many were prepared to say that group members had all contributed equally. No child was prepared to say that they had done more work than the other. Even Sam in his interview said that Samantha had helped him. This suggested to me that collaboration is important to pupils and it is clearly something worth pursuing but we need to find ways of making the collaboration more productive.

The observation process told me a great deal about how pupils were responding to the tasks I set. I was disturbed to find that what I had thought to be relatively 'easy' tasks proved to be so difficult for the Year 6 children. The data handling activity, which I thought would have been appropriate for younger children, proved to be difficult. This was surprising, as the two girls were mathematically quite able as the results in their National Curriculum Mathematics test later revealed. Having the opportunity to observe the children working in such a detailed manner (which would not normally be

the case) my Year 2 colleague and I were able to assess what had actually occurred during the task.

Discussing issues with colleagues

The data analysis also provided a foundation for a productive discussion with colleagues. A wide range of issues were raised and discussed initially within a small group consisting of my research assistant, the Headteacher and the Year 2 teacher. I list below in outline the sort of issues that were covered. These were not presented as definitive findings but rather as a number of puzzles and questions that had arisen through my inquiry.

- Data handling can be taught in the ICT Suite although this is underdeveloped
- Teachers' decisions about the pairing-up of pupils in the ICT Suite is a crucial factor in their learning
- How can we achieve a better balance in terms of time spent by different groups of pupils in the ICT Suite?
- How can we achieve a better balance in terms of the full range of curriculum areas using the ICT Suite?
- How can we make better judgements about the suitability of software and related tasks throughout the Key Stages? Colleagues need time to be able to evaluate these.
- Using the ICT Suite has a positive effect on pupil attitudes to learning. How can this help us in other areas?
- Teachers' confidence and competence is a crucial variable in successful use of the ICT Suite. How can we build on the benefits of the NOF (New Opportunities Funding) training that took place alongside this project?
- The most common activity in the ICT Suite focuses on writing, particularly within the context of English. How can we develop the uses of the computers for other purposes?
- The teacher's intervention strategies are an important variable when pupils are working collaboratively. We need to share good practice with regard to this.
- Teacher questioning is important for checking understanding when pupils have been working collaboratively at the computer. We need to share good practice in this area.
- Pupils' understanding of the tasks set is sometimes partial. How can we improve the way we explain the task and reinforce with the display of learning objectives?
- There is a need for better planning to ensure that the use of the ICT Suite supports a variety of programmes such as literacy and numeracy at the optimal time of the year.
- Access to computers outside of school is a key variable. How can we take this into account?

Implications for practice

Discussions within the Senior Management Team enabled us to consider the implications of these issues for practice in our school. The discussion was subsequently extended to include the staff as a whole and this process has continued to develop and enrich the way we work as an organisation.

It is hard to generalise from such a small scale project of course but a few insights stand out for me. For example it is clear that using the ICT Suite promotes positive attitudes to learning. All the pupils enjoy using the computer even when they are not so successful in completing their tasks. The 'learning can be fun' message helps to offset the stresses and strains of the National Curriculum testing regime.

It was also evident that pupils in our school saw a value in working together on a computer. Collaboration does seem to have the potential to enhance learning if it is the right type of collaboration with a carefully chosen partner. Collaborating around a computer certainly lends itself to more interaction and discussion between pairs, which helps them to express what they are doing. This can encourage the pupils not only to see the end product but to be more aware of how they got there and what happened on the way, thus developing their metacognitive capacity.

The Year 2 teacher and myself agreed that the standard of work arising from working in the ICT Suite is usually higher than that produced in class. Using the Internet allows pupils to access more information quickly. The computer enables a high quality of presentation which all children can achieve, with a high level of pride in their work being evident. As their skills develop, the pupils find that they can alter mistakes more readily, free from the teacher knowing what original errors they made and without spoiling the presentation. In data handling they can print a graph which they have made without errors.

The project enabled us to identify aspects of practice which we needed to work on. We were able to agree on a restructuring of the use of the suite including key decisions about timetabling, what it is actually used for and how we can meet National Curriculum learning objectives. This involved target setting and planned continuity and progression throughout each year group. The ICT Suite is now used for more Mathematical activities and staff are much more familiar with all the software currently available. We also learned that we need to be very careful in setting tasks, intervening during the sessions, instructing the children, making the learning objectives clear and being aware of what is happening between the pairs when working on the computer.

My reflections on the process

The research process was a most worthwhile experience not only for myself, but for my school and subsequently the pupils. I learnt many things both about the research process and about my own practice. I now have the confidence and knowledge to be able to design further projects. One important lesson for me as a teacher researcher is that it can all look good on paper but in practice things go wrong; tape recorders break down, you forget to ask a question, the pupil you want to work with is absent and so on. Time for reflection throughout the process is therefore crucial. It keeps you on track and allows you to consult with others to help validate your interpretations and proposals for improvement.

The study enabled me to develop insight into children's learning which I would not normally have the opportunity to do. Now I have more confidence in my observing, interviewing and questioning abilities and since then I have been able to use them continuously to inform my practice. It was fascinating to see just what happens in the

teaching and learning process once a task has been given. I am more conscious of my role as teacher in the setting of tasks and how they are interpreted by children. My practice has been enhanced because of this.

In the four years or so since the completion of my project we have continued to monitor the way we use the ICT Suite. We have upgraded the equipment and changed from using Macs to PCs largely to align the computers with the Interactive Whiteboards we have introduced. Colleagues are now much more familiar with the range of software available and how it can be used more effectively and in a wider range of contexts to enhance pupils' learning. However, as Headteacher, I continue to encourage the kind of critical discussion that my project sparked.

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