


Education Departments' Superhighways Initiative

Group A: Curriculum Projects in England and Wales

Final Report

University of Leicester School of Education

Maurice Galton, Chris Comber, Linda Hargreaves, Tony Lawson, Ken Fogelman

University College of Wales, Aberystwyth - School of Education

Richard Thorpe, Dilwyn Roberts-Young

External Consultants

Tony Eldridge, Mike Rumble

The evaluation

1. This evaluation concerns seven curriculum-focused projects that were based mainly in the primary and secondary sectors in England and Wales. Two further projects in the group were located in Scotland, and were the subject of a separate report produced by the Scottish Council for Research in Education (SCRE). The projects were extremely diverse in scale, ranging from a single infants school with two machines to a group of around 30 secondary schools and sixth-form colleges exploring a range of technology. Projects also varied greatly in their organisational and technological structure, and their aims and objectives. What united the group was a classroom focus, with teachers and pupils exploring the potential of a range of ICT technologies to enhance teaching and learning.

5. JOURNEYS THROUGH SPACE AND TIME, NOW CALLED 'ROSENDALE ODYSSEY'

5.1 The evaluation commenced in late February 1996 with a visit to the Photographers' Gallery, where the project co-ordinator and the project's own evaluator were interviewed. In March 1996, and subsequently for two days in each of the next three terms, observations and interviews were carried out in the school with teachers, pupils, artists in residence and staff from the Photographers' Gallery. Because of their age, no structured questionnaires or attitude measures were used with these pupils. Instead, semi-structured interviews and extended observations were carried out. As well as these school visits, exhibitions of the children's work to parents in July 1996 and to the general public in March 1997 were also attended and informal observations made.

Description of project

5.2 The project involved collaboration between Rosendale Infants School, South London, and staff from the Photographers' Gallery. The school celebrated its centenary in 1997 and, as part of the celebrations, the school sought not only to explore its past but also to allow children to explore their own diverse personal histories using photography and digital imaging. The immediate outcome of the project was to produce material for an exhibition at the Photographers' Gallery, but the images and stories compiled by the children during the year were also used to develop the school's site on the World Wide Web (WWW). The school also sought to exchange images, ideas and stories via e-mail with children in other schools locally, nationally and internationally, although this was planned for the future, to be closely managed by staff. Some project work using WWW materials, again under strict staff supervision, had just started at the end of the evaluation.

Sponsors and other parties involved

5.3 The children were given the opportunity to work directly with photographers and artists in residence using Photoshop, an image manipulation program, and Hyperstudio, a multimedia authoring tool specifically designed for use by children. Pupils were thus provided with the ability to collate, design and produce their own interactive program. In addition to the support from the Photographers' Gallery, the project was funded by the Sir John Cass Foundation, the Gulbenkian Foundation and the Walcott Educational Charity. Sponsorship, in the form of a digital camera, was provided by Kodak, and technical support from Artec, the Arts Technology Centre. The charitable sponsorship paid for the costs of three artists in residence.

Size and type of institution

5.4 Rosendale Infants School is a large inner-city school in the London Borough of Lambeth with a three-form intake of approximately 90 children per year, plus a nursery. There are 22 different languages in the school, with children from African, Caribbean, Asian, Chinese and European descent.

Technical issues

5.5 Three RM 486 multimedia machines and several 186s were already available. Apple Macs were chosen on the recommendation of the consultants, partly because the system was well-known to gallery staff and to the artists in residence, thereby ensuring compatability. A decision was taken to avoid problems of compatability by not seeking similar software to use on the existing RM machines. Connectivity was via British Telecom 2 Mbps telephone line to the Joint Academic Network (JANET) and Channel, the National Arts Network, via Artec's Sun UNIX Server. Future

plans involve cabling the school as part of the Brixton Connection Initiative to be funded from Brixton Challenge money.

Age range of children involved

5.6 The age range was five to seven years, with the greatest involvement in Year 2. Some of the children who did not have an opportunity to participate in the first year of the project had a continued involvement in Year 3 during the first term after their transfer to the junior school.

Number of teachers involved

5.7 Two teachers were trained to become highly competent in the use of Hyperstudio, with three other teachers making use of the program to a lesser extent.

Background experience of the staff

5.8 Although the school's IT co-ordinator was competent in the use of the existing RM machines, no-one in the school had experience in the use of Hyperstudio or Photoshop.

Aims and objectives

Original aims and objectives

5.9 The project's aims were:

- to develop innovative strategies for young children and teachers in early years education to access new technologies
- to create the opportunity for young children to produce an interactive multi-media program for distribution and collaboration across the Internet
- to encourage and enable children to investigate local and global histories
- to research and establish direct links with other children in primary schools nationally and internationally
- to enable the whole school to contribute and participate through cross-curricular activity, particularly in the subject areas of geography, history, art and IT
- to develop ways in which photography and new technology can be used in the classroom
- to enhance and complement learning across the curriculum.

5.10 The expected outcome was the production of a multimedia program, using images, text, music and voice-over, for distribution and collaboration across the Internet.

Amended aims and objectives

5.11 The project has achieved most of its aims. 'Journeys Through Space and Time', renamed 'The Rosendale Odyssey', has been installed on the Web site and is part of an exhibition at the Photographers' Gallery. Because of the need to complete the work for the exhibition before the artists in residence ended their time at school, some Year 2 children were denied an opportunity to use Hyperstudio. They have

been introduced to the technology in the first term of the current year after transfer to the junior school as part of a new project exploring various aspects of the school and the people who work in it. The technology has now been introduced in the Reception class, where children are devising their own literacy program. Exchanges using e-mail are only just beginning but may be expected to increase, both nationally and internationally, after the exhibition.

Original timetable

5.12 The original plan envisaged that the program would be completed by July 1996, with the exhibition at the Photographers' Gallery taking place in October 1996. The sheer volume of material produced by the children and delays in mounting the exhibition allowed further work to take place during the Autumn Term. This was made possible by extending the support from the Photographers' Gallery and by freeing the school's IT co-ordinator from teaching for the whole term.

Evaluation

Initial training

5.13 Initial training was provided by Artec in a form of a one-day introduction to the use of Hyperstudio and Photoshop for the whole staff. Staff reported that the day was very valuable in so far that it opened their eyes to the possibilities of the technology, but few felt confident as a result of the training that they could then operate the program for themselves. This was therefore followed by weekly INSET to introduce staff to the two main items of software, Hyperstudio and Photoshop, carried out initially by staff from the Photographers' Gallery and one of the artists in residence.

Technical and educational training

5.14 Following the introductory stage of training, further regular support was provided by the artists in residence, the co-ordinator from the Photographers' Gallery and also by the internal evaluator, a member of staff from Middlesex University. Training took place after school as and when staff were available and could be freed from other conflicting demands. Teachers, however, were not really confident during the first year, 1995/96, mainly because there were few opportunities for them to practise what they had learned during training. As a consequence, the IT co-ordinator, for example, felt that she mastered the use of Hyperstudio only when she was able to take the machine home during the summer holidays and work through the programs for herself. Although, from the outset, staff were clear about the educational impact of the technology, their lack of technical expertise and the priority given to completing the children's work for the project meant there was little time for staff to experiment and to develop other initiatives.

5.15 The invitation requesting children and parents to supply family photographs, letters, etc. produced more material than the artists could cope with. Since only two machines could be bought out of the school's budget, a third Macintosh computer had to be brought in on loan from the Photographers' Gallery until the end of 1996. Even then, the sheer task of working with a selected number of children and their parents to "get something onto the machine" took up most of the school day. After school, the artists tended to work on this material to improve its presentation, mindful that it would be the subject of a later exhibition.

5.16 Inevitably, when the Summer Term came and much work still had to be done, the artists had to be even more selective as to the pupils with whom they continued to work. As a result, the original intention to give as many pupils as possible experience of working in Hyperstudio had to be abandoned. This was a difficult

time for the project because teachers in the school felt that "it was out of their control" and concerns were expressed about the lack of equal opportunities which resulted from the selection of some children's work rather than others.

5.17 As a result, in the Autumn Term of 1996, when the artists' contracts had been completed, the IT co-ordinator, with the continuing help of the internal evaluator and the co-ordinator from the Photographers' Gallery, mounted a programme for those children from Year 2 who had now transferred to the adjacent junior school but had not experienced working with the new technology. This was very successful and these pupils produced a similar portfolio of materials to that in Journeys Through Space and Time based upon the life of the infant and junior schools and the people who worked in them. This arrangement was possible only because the IT co-ordinator was freed from teaching a class by moving her to the Nursery Unit where the intake was not due to rise until after Christmas. During this term, more teachers have been trained and there is increased activity in Reception and Year 1 classes. By February 1997, the original target aim of involving around 500 children in the programme was on its way to being realised.

Management strategies

External

5.18 Given its relatively small scale, the project's management structures tended to be informal. Technical matters and the organisation of the artists in residence were handled by the project co-ordinator from the Photographers' Gallery, who generally dealt with any technical problems which occurred.

Internal

5.19 The deputy head was the official co-ordinator for the project but the headteacher was the prime mover in its creation. Since the artists in residence ceased their work in the school, the IT co-ordinator has taken increased responsibility for organising the use of the computers and for training other colleagues in the use of Hyperstudio. The headteacher's intention in appointing the deputy head as co-ordinator was to increase his interest and involvement in information technology but this does not seem to have happened and currently, within the internal management structure, different teachers take responsibility for different aspects of the work. For example, a Year 1 teacher has responsibility for co-ordinating and supporting e-mail activity.

5.20 It was unfortunate that at the commencement of the project the headteacher, who had been instrumental in setting up the arrangement with the Photographers' Gallery, should have had a term's sabbatical. Her absence probably increased the likelihood of tensions occurring between the artists and teachers in the initial stages, because there was no-one among the teaching staff with the vision to articulate clearly the perceived benefits to the school in devoting a considerable amount of time and effort to the new technology. Prior to the commencement of the project, the school had completed a satisfactory OFSTED inspection but the inspectors had made a number of recommendations which staff were anxious to implement. Some teachers felt the demands of the project were an unnecessary distraction from the more immediate need to fulfil the OFSTED requirements.

Obtaining and installing equipment

5.21 There were some teething troubles when installing the equipment, and occasions when connection to the server broke down, but these were usually resolved speedily. Little criticism was voiced by the teachers on technical aspects of the project. The advantage of having the additional computer on loan from the Photographers' Gallery was that it provided cover when small technical difficulties arose. Its removal in Summer 1996 did not present major problems of utilisation.

Without the presence of the 'extra hands' provided by the project co-ordinator and the project evaluator, there was insufficient adult support available for more than two groups of children at one time to work in the library on the project.

Implementation at project and institutional levels

Creating cross-institutional relationships and support

5.22 The misunderstandings that took place at the start of the project were not only a consequence of the headteacher's departure on sabbatical leave. There was, inevitably, a clash of cultures between the teachers and the artists which, as reported earlier (see paragraph 5.16), resulted at times in the teachers feeling that they were not in control of what was happening in their classrooms. In the beginning, teachers tended to view the artists as advisory teachers, people with the expertise to provide necessary training and guidance on how to extract the maximum educational benefits from the technology. On the other hand, artists saw themselves as facilitators whose task was to demonstrate the potential of the medium and then to support the teachers' and the children's own ideas.

5.23 Initially, because the artists were under immense pressure to complete the project within a short time-scale, they were not always appreciative of the disruptive effect on timetables when children were pulled out of classrooms at short notice, or when a promised ten-minute demonstration to the class went on for nearly half an hour. However, as the quality of the children's work became evident, teachers' reservations gave way to enthusiastic support and excellent relationships quickly developed. This allowed more open discussion about the problems of incorporating the project's demands within the normal timetable. Over time, the artists tended to acquire certain basic teaching skills so that their presence in class was not so disruptive to the calm working atmosphere which generally prevailed.

Further training and support

5.24 As indicated earlier, most training has taken place through informal contacts with the project co-ordinator from the Photographers' Gallery and within the school, where teachers would ask the IT co-ordinator for help when they came across a problem.

Maintaining equipment

5.25 The general contract for the school's IT maintenance is with RM and IT Learning Exchange, which is under the auspices of the University of North London. No decisions have been made as yet about the future, since the relationships with staff at the Photographers' Gallery have continued to be close and support is still being offered on a needs basis.

Implementation at classroom level

Curriculum areas covered

5.26 The topic choices have generally concerned history and geography, but, as stated earlier (see paragraph 5.11), the Reception class is now engaged in creating a program in basic literacy. However, most teachers in the school see the future potential of the technology as best expressed within the context of cross-curricular themes such as the Journeys Through Space and Time project.

Raised standards, value added and improved quality of work

5.27 Within the time-scale of the project, it was not possible to engage in formal testing of such young children. The teachers involved have been unanimous in their view that the project has contributed to improved literacy skills and this view is shared by all the parents interviewed. One parent, when asked directly whether the project was

taking away time from her child when they could be learning to read and write, replied:

> *No, it's (the IT work) an addition and he's seeing his words go up on the screen. He is seeing what he says go into writing and you can't get a clearer picture than that of what it all means, what reading and writing is about.*

She continued:

> *When they start, they don't understand what words are because you usually read to them. Unless you go along with your finger to show them the words, they don't even know they're there. If they can talk to someone and they can type at the same time they see their words coming up, I think that's really a clear picture.*

5.28 All observations showed that children were very self-confident in tackling various tasks on the computer, although without an extended study it is difficult to determine how far this was generally a characteristic of children at Rosendale.

Evidence of increased motivation

5.29 The main measure of motivation used here was through observation at times when the computer had been moved into the classroom. Time-on-task levels were generally of the order of 10% higher when groups of children were working on the computer rather than when they were working in groups on other activities.

5.30 In interviews, children also expressed enthusiasm, often stating, as did one child, that although they found maths "Easy peasey, Japanesey", they nevertheless preferred using the computer because it was "more fun".

Productivity gains

5.31 A major problem was the limited access to the machines and the preparation time required in after-school hours, for example, when a class collected pictures or photographed aspects of the school environment using the digital camera. These then had to be scanned into the machine and placed in the appropriate stack ready for children to access them during the subsequent session. The time for an individual child to add a piece of writing to a picture, insert a 'button' and record a voice-over generally required two sessions of at least 20 minutes each, in addition to the transition time required for the child to move from the classroom to the library where the machines were housed. All teachers felt that the desired minimum requirement would be to have at least one machine in each classroom so that the work could be more closely integrated with other activities. No teacher favoured an arrangement in which the computers were sited in one central area.

Changed teaching styles

5.32 The project has had very little impact on teaching styles because, until recently, most children have been removed from the classrooms to work with non-teaching staff on the computers. Nevertheless, greater rigour in the use of the computer for work of this kind can be detected. The artists insisted that children should produce 'storyboards' before using the digital camera or recording interviews with parents and this disciplined approach has continued. For example, instead of the children working out their designs by trial and error on the computer, the teachers now tend to insist that this is done beforehand in a class session. Teachers do perceive, however, a conflict between the drive by OFSTED and others for more subject specialist whole-class teaching and what they regard as the most effective use of the new technology through a cross-curricular approach leading to greater integration and less specialisation.

5.33 Neither is there evidence that the use of the new technology leads to substantial savings in teachers' time, particularly with this age group. As children become more enthusiastic and more knowledgeable about the uses of the technology, there is an increase in differentiation across the class as pupils with different degrees of skill and experience pursue their ideas. This requires a greater amount of individualised teaching, supported by co-operative group work.

Enfranchisement of previously disaffected learners

5.34 For reasons explained earlier, access to the machines up until the Summer of 1996, had to be limited in preparing the material for exhibition. Now that access has been widened, ways of using the technology to support the work of disaffected learners and children with special educational needs are being explored. The school, therefore, seeks to enfranchise disaffected learners by providing the widest possible access for all, but this depends to a large extent upon the capacity to purchase more computers.

Development of information-handling skills

5.35 At present, the control of information through e-mail is handled directly by one teacher. Messages sent to different classes are printed and then distributed. A class message is then produced and entered under supervision, with groups of pupils taking turns. So far, messages have largely consisted of information about the classes or the teachers, for example:

> *I am in Mrs Edward's class. We have made a cafe and shop in our classroom and have called it the Wobbly Jelly. We have made some food out of salt dough to go in the cafe. Do you have a cafe in your classroom? Please write back by E-mail. We are waiting to hear from you. Love, David. (Jan 27 1997)*

5.36 What went on the school Web site has had to be carefully vetted. For example, for Journeys Through Space and Time, some children included their home address in their story line, while another pupil had included a picture of himself and his sister playing in the bath.

Fundamental new skills

5.37 The children developed expertise in a number of areas, including learning to use the digital camera, authoring skills using Hyperstudio, and the manipulation of imagery with Photoshop. The fact that the majority of these children were between five and seven years old makes such achievements all the more remarkable. One purpose of the exhibition of the children's work at the Photographers' Gallery, entitled 'Displaced Data', was to encourage neighbouring schools to undertake similar collaborative projects, although the main task in the first phase was to produce materials and pressures of time have not yet allowed the desired participation with neighbouring schools to become a reality. Towards the end of the project, some children also began to develop networking skills as they explored the Internet, but this aspect of the technology has yet to be fully developed as the material from the Rosendale project had only recently been placed on the Web site and e-mail activity has only just begun. However, the school plans to establish contact with other schools all over the world, and the Rosendale site is being mirrored at Brown University in Providence, USA.

How information was used

5.38 Apart from the work in the Reception class, which is specifically designed to improve literacy, no attempt was made to ground the work within the context of the National Curriculum statutory requirements. Indeed, as reported earlier, there was some initial tension among teachers who believed that the project was taking up time

which would have been better devoted to specific programmes of study. The school clearly sees the main benefits of the new technology as increasing motivation and developing better understanding amongst pupils of different cultural backgrounds, and it is keen to share its experiences with other schools. In this sense, therefore, the project is driven by these aims, and by the children's interests, rather than by a desire to integrate the work into the formalised structures of the National Curriculum. Nevertheless, the project offers an obvious way of developing the IT skills demanded by the National Curriculum, and other activities in which pupils have engaged, particularly the collection of oral histories, which also have obvious links with history and English programmes of study.

Access and equity issues

General information concerning access to the technology

5.39 As reported earlier, two machines did not provide sufficient time to allow equal access for all children within this large infant school. The situation will become worse following the amalgamation of the junior and infant schools in the Autumn of 1997. There are plans to buy more machines and to extend the network, but these are in the formative stage, awaiting the amalgamation.

Implications for learners with special educational needs

5.40 Because of the language problems resulting from a wide intake from different ethnic groups, the school is well-staffed with ancillary support and makes considerable efforts to integrate children with specific learning difficulties into normal classroom activities. Thus, no specialist programme involving the use of the new technology has been devised for such pupils, although care has been taken to ensure that they have not been excluded from participation in the various projects.

Gender issues

5.41 Observations during three visits spread over a year recorded that female and male pupils enjoyed equal access to the computers in terms of both time and occasion. Among the team of artists who worked on the project, concerns about equal access for female pupils in particular was very strong and extreme care was taken to ensure that boys did not dominate when mixed gender groups were working collaboratively.

Services and applications

Frequency and type of use of facilities

5.42 As reported earlier (see paragraph 5.11), access was restricted in the project's first year because of the requirement to produce a limited amount of high-quality work for exhibition at the Photographers' Gallery. In this school year, access has widened, although not all classes in Year 1 and 2 are participating. Currently, around 500 of the 900 pupils within the infant and junior schools have had some hands-on experience. However, the ability to widen access beyond these numbers while maintaining quality is limited by the availability of only two computers able to run this software. As a consequence, the purchase of additional machines has now been given a high priority.

5.43 Every opportunity has been taken to disseminate and share the work carried out by some children with peers in other classrooms where there has been no opportunity for hands-on experience. This has proved very difficult at times because teachers have had to carry heavy equipment across the playground to classes that are accommodated in outside classrooms. Public displays have been mounted for parents, and the results of the Journeys Through Space and Time project is now on the school's Web site.

User friendliness

5.44 Hyperstudio is a specially designed program and, despite early misgivings by some teachers, it has proved easy to use even with the youngest children.

Meeting the aims

5.45 The project has achieved all of its stated aims and there are now plans to move beyond these to a point where, as funds permit, the new technology will become fully integrated with every aspect of the school's work. The main advantage of the project has been that it was very clearly focused on meeting a clear educational aim so that the potential for the technology for wider uses, including its use for administrative purposes and, for example, in the production of materials for teaching, has not been widely considered. As in any successful innovation, however, there are signs that teachers are beginning to explore other uses of the technology, such as in the production of literacy materials by the Reception Class pupils. Here, in accordance with the school's philosophy, children are creating their own materials under the guidance of the teachers, rather than the teachers producing materials in out-of-class hours.

Cost and cost effectiveness

5.46 The project was supported by funds from charitable trusts and the school also actively sought mainly local affordable sources of technical and curricular support for a particular project. From this carefully defined and planned beginning, there has been an organic development as children and staff became more experienced and enthused. The school worked with a range of medium- to high-level technologies, which included, but were not solely reliant on, broadband connectivity. The social, educational and personal benefits were clear, and the costs of maintaining the present level of activity are within the budget of an infant school in a relatively disadvantaged area. This project represents a powerful model of cost effectiveness for other schools, particularly those in the primary sector.

Conclusion

5.47 The project involved a single school, and grew from a clearly-defined curriculum project to become an ongoing, cross-school, cross-curricular project, which has already reached well beyond the confines of the infant school. Ironically, the very success of the project has created a demand to expand the facilities so that every class has connectivity. Without additional resources, and even allowing for the loss of half a teaching assistant's post, the aim of a computer in every classroom would take four years to achieve.