Sharing Innovative Practice

The NCTE's Schools Integration Project 1998-2000

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Edited by Conor Galvin

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Conor Galvin, Editor

Contents

Section Four — Additional Material

Foreword

In September 1998 the Department of Education and Science, through the NCTE, invited schools to apply for inclusion in the Schools Integration Project (SIP). Applicants were encouraged to propose project ideas that would exploit Information and Communication Technologies (ICT) in developing innovative practices in teaching and learning. The response reflected the rich tapestry of the ICT activities already taking place in schools and the desire of teachers and school managers to extend and enhance these, and to explore new methodologies and learning opportunities.

Engaging in innovative practice is rarely a painless process and, as the project coordinators will testify, SIP was no different. The project coordinators learned new skills, modified their teaching practices and, in their role as project managers, organised all aspects of their project implementation. A primary role of the project coordinator is to disseminate their experiences — to tell the story of SIP from their own perspective. The collection contained in this publication is part of this story and is a testament to the resilience and ingenuity of our teachers.

The role of the NCTE in SIP was primarily one of support and facilitation and, along with the project teams around the country, we learned as we went along. Together we created a climate of collaboration, sharing and risk-taking. It is precisely this culture that allows innovation to flourish and enhances all of those who participate in it.

Although SIP investigates and exploits the innovative use of ICT in teaching and learning, it is not technology driven; rather it depends on the quality of the people involved for its success. I would like to particularly thank the project coordinators for their energy, enthusiasm and good humour in the face of adversity. I would also like to thank Jerome Morrissey for his unremitting support, Conor Galvin of University College Dublin for the help so freely given and finally Adrienne Webb and Breeda Meleady, without whom none of this would have been possible.

Séamus Knox
National Coordinator, SIP
March 1998–March 2001

Introduction

These are often seen as cynical and unsettled times for education in Ireland. All the more reason then to celebrate a project which is characterised by 'ordinary' teachers doing extraordinary things.

The Schools Integration Project (SIP) was commissioned by the Department of Education and Science, Ireland, as part of the *Schools IT 2000* initiative — a four-year drive to place information and communication technologies at the heart of the educational experience across the compulsory years of schooling in this country. SIP was announced in late 1997 and in the early summer of 1998 an invitation was issued to schools to bid for funding to undertake special projects involving ICT. The overseeing of SIP, and the selection, resourcing and support of the project was the responsibility of the National Centre for Technology in Education (NCTE). The principal aim underpinning SIP was 'to foster whole school development in relation to information and communication technology (ICT) integration'. 'Pilot projects' were proposed for a number of schools working 'in partnership with the education centres, the community, industry, businesses, and third level institutions' (NCTE, 1998).

What happened caught many by surprise — some interest in the idea of piloting ICT integration was expected, but nothing on the scale of what emerged. Quite literally, hundreds of schools clamoured for entry to the project. Inevitably perhaps, the initially mooted forty SIP *schools* became forty SIP *projects* and then seventy — involving eventually in excess of 300 schools. These comprised separate and highly diverse local and school-level efforts, each of which was intended in some way to test-out or develop information and communication technology (ICT) usage, pedagogies and/or resources that may have particular relevance to the Irish context. Projects involved anything from one to a dozen schools and covered a bewildering range of topics, activities and intended outcomes. SIP activity involved primary, second level and special schools, from a range of social and geographical settings. It also included business interests, social and community organisations, colleges and departments of education and other higher education institutions.

Supporting such a degree of diversity has provided a significant logistical challenge for NCTE staff at national and regional level, but the rewards for doing so have been equally great. What struck the observer most forcibly on visits to SIP schools was the range of innovative activity encompassed by the Project and the levels of dedication and enthusiasm that individual teachers up and down the country brought to their involvement. This must not be lost to our education system.

In early December 2000, a symposium was convened at Portmarnock, Co Dublin, at which twenty of the early-initiator SIPs were invited to present

papers on their work in progress and in prospect. What they had to say makes interesting reading and represents an honest and open account of the realities of working with 21st century ideas in oftentimes less than ideal conditions. But, more importantly, it also illustrates what is possible when teachers apply imagination and professional know-how to the challenges of integrating ICT into the teaching and learning day.

The symposium also provided time and opportunity for teachers and others involved in the education ICT agenda to meet and debate the future of new learning and teaching technology in our schools and our country. Notes from some of the roundtables which took place over the symposium are also included in this publication, as are the keynote papers which opened and closed the event.

The message from Portmarnock is primarily a promising one — integrating ICT into education works, but it takes time, resources and enthusiasm.

For those with an interest in using ICT to enhance teaching and learning within our schools and more broadly within our society, these are exciting times. The scale of SIP activity marks it out as one of the largest, nationally co-ordinated, school-level ICT initiatives to date in Europe. Therefore, the challenge of evaluating and disseminating SIP results and outcomes — of 'mainstreaming' the best of emergent practice and pedagogy — is a formidable one. What is needed now is imaginative policy to build on achievement to date. This publication is intended to contribute in a constructive and honest way to the discussion surrounding that policy.

Conor Galvin
University College Dublin
December 2002

Section 1:
Background

ICT in Europe's Schools:
Towards a Critical Mass

Roger Blamire,
Innovation Manager, European Schoolnet

When the early explorers 'discovered' the Alps, they pointed to the mountains and asked the local people for their name. 'Alp' was the reply and the name has stuck. What the local inhabitants saw with their eyes were the high pastures, which were of economic importance to them. The mountains were invisible in their mindset.

It is probably the same with the Internet. We 'locals' see being online in restricted ways that a visitor from the future would probably see as blind to its true potential and real value. Yet, the seeds of future trends are here now, if only they were visible to us.

For education, this means that someone somewhere has already begun inventing the future, the successful practice of which will be adopted massively in years to come. The task of organisations like the European SchoolNet[1] is to help identify such innovation, amplify its effect and increase the speed of general uptake. It is also partly why the Schools Integration Project[2] has so much to commend it. It is certainly why I am delighted and honoured to be asked to offer this paper on SIP and the notion of critical mass in ICT.

First some contexts shaping the future:

1. An online Europe — eEurope — is being constructed[3]. It promises joined-up, more efficient government providing online services for eCitizens and a framework to enable e-commerce to thrive and compete globally. One of eEurope's big challenges is social exclusion — all the indicators point to greater disadvantage for some if the digital divide is not overcome through public sector measures, including education[4].

2. The eLearning initiative[5] derives from eEurope and is designed to work through national efforts in three key areas:

   - Access to the Information Society for all through the provision of affordable Internet access at high speed throughout Europe.

   - Training — for all of course, and throughout life — in order to participate in an online Europe.

   - Collaboration, to share innovation, expertise and success — learning to work in new ways.

The pace of change of technology and its potential to change shows no sign of slowing. It is becoming ever more affordable, ubiquitous and mobile. Broadband access means that being online is to participate in society, being offline is to be invisible.

The effect of ICT on education is still barely noticeable in many a European school. They are grappling with issues as important as ICT, for example, raising standards, managing budgets and staff, introducing revised curricula. Yet in others we are already seeing sea-change phenomena like 24/7 schools, 'dissolved boundaries' between classrooms and homes, and 're-engineered' classrooms.

Outside school, among young people, ICT use is pervasive: 60% of UK children have home Internet

access; those with mobile phones are sending 2.5 text messages a day; 25% of European 15 to 24 year olds used the Internet in the past two weeks. They inhabit a connected world and effortlessly adopt the grammar and culture of the Internet — 'homo zappiens' as they have been called, no doubt describing the children who can see the eAlps (and also sketching a future task for schools in a world of 'me-now' instant gratification). Parents, however, are concerned that educational standards are in decline and some, supported by the media, want schools to return to a 'golden age' of high educational standards and discipline, with not a computer in sight.

Such issues were discussed by policy-makers and practitioners at the EUN Millennium conference in March 2000. Ten key propositions were identified[6], including:

- 'dare and share' — the need to develop a culture of innovation and experimentation at a time when there is no clear road map for the classroom of the future, and then to share what works with others. Not uniformity but pluriformity.

- achieve critical mass as quickly as possible. There are 500,000 schools in Europe, five million teachers and 80 million pupils. The challenge for governments is to enable a significant proportion of them to be regular, effective and confident users of ICT. If not, two expensive systems will co-exist — the wired and the paper (the bits and the atoms) — and young people will face a lottery to be prepared for the Information Society.

- evidence. Sceptics and those resistant to change, may well be persuaded by compelling evidence that innovation pays off. Therefore, documenting replicable and sustainable success will become increasingly important to impact on a critical percentage of teachers and voters who want to see a return on taxes spent on ICT.

So, what has to be done to achieve the take-off conditions for critical mass? In most countries the approach is threefold:

1. Infrastructure. In Finland and the Netherlands for example, schools have broadband access at no cost to them. In the UK 86% of schools are online (70% of them over ISDN or faster), and the average school has 23 computers with Internet access. The cost of equipping schools is high even without considering maintenance and replacement costs.

2. Content. Infrastructure alone, without quality content and services, is useless. Take-off requires schemes to assist in the purchase of software, courses and services and schemes which foster the development of local and grassroots content suited to the language, curriculum and culture.

3. Usage. The toughest challenge is ensuring that all teachers are adequately trained in the use of ICT. In many countries some 30 to 40 percent of teachers are competent with ICT and use it in lessons, but there are signs that far from being a critical mass, they represent a plateau. A significant training challenge faces schools in Europe if a majority of teachers are to adopt ICT.

What will it look like when we reach critical mass? The EUN is investigating the future now and developing scenarios for the future. It is doing this in schools across Europe and in countries like Sweden where, as it were, the 'Alps' are visible. What is important is to paint a picture achievable by the typical school with typical resources. The European SchoolNet in some ways is such a future. It joins up 23 national networks, including Ireland's *ScoilNet*[7] and enables teachers across Europe to work together in virtual communities, exploring new ways of teaching and learning.

The Schools Integration Project (SIP) is another. Probably the biggest 'bottom up' initiative in Europe (Canada's successful *GrassRoots* project is similar[8]) with its 75 projects involving 370 schools, SIP has, to me, many of the features potentially enabling critical mass to be reached:

- invisible ICT. The projects are built around the curriculum and schools, and people, and the focus is on learning, not technology.

1   http://www.eun.org
2   http://www.sip.ie/
3   http://europa.eu.int/comm/information_society/eeurope/index_en.htm
4   A US study found that 82% of Americans in the highest social class had been online over a two-week period compared with 51% of Europeans. Yet among people in the lowest social class 26% of Americans used the Internet compared with only 7% of Europeans.
5   http://europa.eu.int/comm/education/elearning/comen.pdf
6   http://www.en.eun.org/conference2000
7   http://www.scoilnet.ie/
8   http://www.schoolnet.ca/grassroots/e/index.asp

- a light touch from the top, providing a framework where innovation and experimentation are encouraged
- teachers are trusted to create grassroots innovation and conditions for new ways of learning
- schools are acting together, not competing — promoting a spirit of sharing and communication
- with the focus on learning, not ICT, in-service training is invisible — a by-product. ICT skills are developed for a purpose not for themselves.
- a refreshing absence of obstructive jargon, ICT terms, acronyms and academic superstructure

Time will of course tell if these conditions are sufficient to cause the changes sought. It may be necessary to consider the following issues:

1. Process or product? The outcome of many projects is a Web site, but, with seven million new pages appearing every day on the Internet, it will need considerable effort to make the site visible, original and integrated into large-scale school practice. Maybe it is the process of developing the site and learning to work across time and geography that is of more value in fact.

2. Evaluation. While it may be inappropriate and perceived as threatening to bring in external evaluators, action research, involving the reflective teacher, could well be a means of assessing whether a project leads to beneficial change. Action research is based on a cycle: do, reflect, plan.

3. Institutional change. In Finland and elsewhere research shows how there is a difference between individual teachers achieving wonderful things with ICT and a whole school adopting new ICT practices. To change a school — in some ways designed to be stable and transmit lasting values between generations — requires a number of levers to be pushed, for example visionary leadership and empowerment.

4. Critical masses. Other teachers and schools may view pioneering colleagues with suspicion if not derision. Merely showing good practice does not mean others will adopt it; they need to want to and have the means of doing it on their terms. Many teachers are successful in terms of pupil motivation, subject expertise, and classroom technique. Why change, especially if using ICT is presented as requiring a change of methodology from whole-class to constructivist? Many such teachers are excited by interactive whiteboards, seeing them as something to enhance how they teach without undermining their pedagogy. Many other teachers are rightly concerned about Internet safety and will want reassurances that values are maintained in new ICT environments.

The classroom of the future, if classroom it will be, is going to be difficult to create. But somewhere in SIP, in the EUN, or perhaps outside it, are the beginnings. Our task is to spot them and help others learn from them, through initiatives like eSchola an annual week of sharing success across Europe[9]. Otherwise the Alps will never be visible, let alone climbed.

I end by offering a few recent quotations on the topic of education ICT/ the Internet as food for thought:

"Who is going to get to the future first: the learner, the teacher or the school?"

"Let the children run past you."[10]

"The role of the teacher is to build relationships."

"Build the most exciting learning environment possible."

"The Internet is where learning takes place."

"'We're going to eat your lunch.' — American online education entrepreneur to teachers."

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9   http://eschola.eun.org/

10 A MIT instructive research project found that slum children quickly learn to use computers, even without teaching. In New Delhi, 'minimally invasive' education produced startling results. Children lacking basic reading and writing skills were given a chance to experiment with a computer 'kiosk' on the edge of the slums. Despite being mostly unfamiliar with English, the kids learnt how to browse the Web and draw pictures after just a few days. Researchers Mitra and Rana from MIT were deliberately evasive about the purpose of the machine, and were surprised to find the kids who knew the most spontaneously began teaching groups of other children

Where does IT go from here. . .? Moving Education ICT Beyond *Schools IT 2000*

Conor Galvin

Introduction

The use of information and communication technology (ICT) in education has already begun to change the way we think about teaching and learning in Ireland, and even the nature of the teaching act. This change is likely to be radical and essentialising, and yet, ironically, we still know — with certainty — very little about ICT in education and even less about how to manage successfully change on the scale that is implied.

Schools IT 2000 has taken us some distance towards the digital future. But lights that burn twice as brightly may only burn half as long, and the initiatives associated with *Schools IT 2000* are set within a mandate that is now up for renewal. Regrettably, there are no signs that the urgency involved has impressed itself on those who must sanction this. Much of the work associated with *Schools IT 2000* is consequently winding down. If we are not to lose a great deal of what has been achieved, this must not be allowed to happen: we need instead to set about the business of building on the progress made and the lessons learnt.

This paper seeks to open a public debate on how best we can move beyond *Schools IT 2000*. It attempts to tease out some of the detail concerning how we have been dealing with the challenge of realising ICT capability within our schools, and in particular to address a number of questions about the policy frame which will move things forward from this point.

Schools IT 2000 can better be understood in relation to the not-overly optimistic, previous history of computing in Irish schools. It is helpful, therefore, to consider initially how we came to be at this juncture in the first place.

Where We've Been. . .

There has been some interest in educational computing in Ireland from as far back as the early 1970s, Department of Education involvement in in-career courses for teachers since 1971, and University interest in the area (via Trinity College, Dublin University) since 1973.[1]

With the arrival of school-affordable hardware and related education software in the mid-1980s, a series of innovative but unrelated initiatives focusing on the use of computers in education began at both primary and secondary level. The most influential of these were probably the three discussed below: the Primary Curriculum Unit IT Project, the Secondary Computer Studies initiative, and Vocational Sector IT development.

Primary Curriculum Unit IT Project

This project ran from 1984 to 1986 and set out to explore the possibilities for teaching and learning represented by a 'new' generation of teaching technology: microcomputers, peripherals and schools' software.

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1   NITEC (1992), New Information Technology in the Irish School System, Dublin: DCU/Department of Education; p29.

A carefully selected number of schools were resourced and supported through the project. These schools — 34 in all — represented the full range of primary school types and student population. Child-centred practices characterised the work of the project and Department inspectors worked with the schools to assist with project evaluation. Word processing, data handling, programming (LOGO, BASIC…), simulations and games, and drill practice were trialled by the project schools and a variety of peripheral devices such as voice synthesisers, large-screen formats and Braille word processors were used in situations where project schools included children with learning difficulties or disabilities.

Although short-lived, this project is seen as having had a very considerable impact on IT awareness among primary teachers and substantial ripple effect throughout the system. Among the outcomes were a number of informal support groups which continued to encourage work in the area after the finish of the project, and two Department of Education publications which gained wide circulation in the primary sector.[2]

Secondary Computer Studies

Computer Studies experimentation began at both Junior and Leaving Certificate level in the 1980s. The Leaving Cert. experiment began in 1980; the Junior Cert. in 1985. Both focused mainly on high-level programme languages, but also covered content about computing — such as its history and the social application of certain computer assisted activities. The modular format under-pinning these initiatives was more a function of inequitable access to resources than an educational statement, but each syllabus allowed teachers a considerable degree of freedom to chose content and tasks appropriate to the school setting and the students' abilities. Neither was designed to be a full, examination subject — the Junior Certificate project was intended to raise awareness of IT in society and provide an enjoyable introduction to the topic. Its Leaving Certificate counterpart was 'bolted-onto' the Mathematics syllabus as an optional extra but allowed for Department Certification on the strength of school-authenticated projects.

The placing of these initiatives within the Science/Maths/Technology sphere is understandable given the climate of the times and the perceptions then surrounding computers and computing. Unfortunately, in common with the experience of other places, this left a considerable 'white coat and locked door' legacy which proponents of more open IT application have had to work hard to displace. On the positive side, the projects did help raise the profile of computing in schools over their lifespan, and were responsible for much of the earlier ventures into computer laboratories and IT teaching rooms in second-level schools.

Vocational Programmes and IT

The mid- to late-1980s also saw a series of highly influential IT developments and projects in the vocational and training sectors. For example, the *Fás* Training Centre at Loughlinstown was acknowledged to be among the best equipped IT training facilities in Europe, and ran a number of courses which heavily influenced electronic and other light industries in the Dublin area. This was a largely EU funded initiative, and represented a strong statement about technology and the future Irish economy.

Within the Vocational schools' network, a number of EU funded IT projects also ran at this time. The most influential of these was probably the *Euro TecneT* Project which took place between 1984 and 1987, with an extension phase to the end of that decade. This project saw eight schools given generous grants for the purchasing of IT equipment, and teaching support in the form of Department Inspectors and tailored in-career courses for all participating teachers. These courses were provided by what was then Thomond College, Limerick. The schools worked on either electronics or data processing topics, and explored issues such as computer interfacing, CAD, control technology, application use, and technical writing.

These *Euro TecneT* projects were highly influential for a number of reasons. Most significantly, by moving the emphasis away from programming alone, they broadened the range of IT experiences available to students in the formal school system and did so in a way that fundamentally influenced the way electronics was taught at the time and has been since. In addition, these projects provided the conceptual framework on which VPT programmes, LCVP and aspects of Transition Year (TY) practice were subsequently based.[3]

In brief, while there has been a not inconsiderable amount of IT activity in schools since the early 1970s — and particular since the arrival of *Apple* and *BBC* microcomputers on the scene — and while the 1980s saw a flurry of IT activity, this was essentially the work of dedicated, individual teachers who were enthusiastic about the possibilities they perceived schools' computing could offer. In this they were supported by a handful of Department of Education inspectors, teacher union officials, a small number of university and college lecturers who shared this vision, and by dedicated colleagues from across the teaching spectrum who banded together to form self-support groups like the Computer Education Society of Ireland (CESI).

More than anything else it was this degree of individual interest and enthusiasm — rather than any official policy — which drove the development and direction of IT in Irish schools until the mid-1990s. Then it all started to change.

The Watershed

Many attribute the sweeping changes that we have seen in education ICT in the past few years to one man — Michéal Martin, TD. This is understandable given the public profile he maintained on the issue as Minister for Education, and it must be acknowledged that Minister Martin was undoubtedly a significant force for change during his time at the Department. His style was that of a moderniser and his policy touch deft and not for turning. But there was more to events than this and in ways the Minister was simply an adept beneficiary of time and place.

The sweep of IT into education would have happened anyway — it simply may not have happened so abruptly.

Two very different and related but separate events were arguably the real beginnings of the changes we have seen recently in regard to schools and ICT in this country. These took place almost two years and half a world apart; the launch of *Netscape Navigator* and the publication of the EU's *Learning in the Information Society* (1996).

Navigator

The launch on 15 December 1994 of *Netscape Navigator* 1.0 — the browser that would change forever, the way the world perceived and used the Internet — was of defining importance in the way the Web subsequently developed. Its essentially visual and hypertext-driven interface opened up the real possibility of the Internet finally becoming a truly accessible, educational media.

By late August of the following year, Netscape had made its IPO (and had been valued at $4.4 billion) and Microsoft had made its famous U-turn and entered the Internet arena with *Microsoft Explorer 1.0.*

By the summer of 1996 the World Wide Web was recognisably the global phenomenon we know today. The advent of user-intuitive access to the Internet, which these new generation browsers allowed, opened up staggering possibilities for how we sourced and used information in our lives. A sense of the times is nicely caught in this comment:

> '*By mid-1996, millions of people were accessing the Web, thousands of companies were serving it, and the press was writing about it constantly. Internet Service Providers (ISPs)*

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2   *IT in Primary Schools: Guidelines* and *IT in Primary Schools: Notes on Education Software.*

3   NITEC (1992); p. 37-38.

sprouted everywhere… Computer jocks in small towns around the globe started putting up their own homepages, and soon enough offered to do the same for businesses, the local shop, and individuals.'
Berners-Lee (2000: 117)

Additionally, 'dotcoms' — with all their associated arrogance and pushiness — began to drive the business revolution of our times. The big IT players — names like Intel, Siemens, IBM etc. — and telcos (including our own Telecom Éireann, as it was at the time) — began, for a variety of reasons, to look towards the leverage they could gain in emergent schools' markets.

All of this brought pressure for change to bear on a newly-elected government with a strong sense that the contemporary Irish economy rested heavily on IT and its ancillary industries.

EU Action Plan, 1996-8: *Learning in the Information Society*

Further significant pressures for action on schools ICT resulted from a ground-breaking, EU decision of 1996. Brussels decided to press member states to address what was increasingly seen as the growing advantage the US was opening up in relation to the knowledge economy. Essentially, the US had flagged ambitious plans to ensure that Americans were in a position to take full advantage of the new economies then emerging around digital capability. This included the first, large-scale federal intervention into the area of ICT in school and classrooms — the *US Technology Challenge* (1996). The programme was budgeted at $2 billion.[4]

The EU response was to publish an action plan targeting education in particular for action on ICT. This was launched in the late autumn of 1996 and was intended to supplement and support national initiatives in the ICT area and other Community actions of an educational nature. In particular, it was to add further focus to the work of the Educational Software and Multimedia Task Force which had been in existence since March 1995. The plan contained four lines of action:

- encouraging the introduction of an EU education portal site
- stimulating the development of educational multimedia resources
- promoting the training of European teachers in the use of ICT
- providing information on the potential of audiovisual and multimedia education tools.[5]

The action was of two-year's duration. It was intended that the lines would, by and large, find support from within the budget allocated to the Educational Software and Multimedia Task Force.[6] A figure of 49 million Euro was at the time set aside for task force projects. Forty-six projects were supported (of the eight hundred applications received) involving four hundred and twenty five participants; half of which were universities or schools. But member states were also pursued actively to encourage and fund at the national level 'catch up' activity in their schools.

Education and ICT were — in EU policy terms — now irrevocably linked and tied into a greater economic scenario.

A specific and notable outcome of this decision was the funding of the European Schoolnet (EUN) which since late 1998 has provided a forum for schools and other interested parties to collaborate on ICT projects with a European aspect. Moreover, a considerable amount of the education ICT work identified by the action plan has since been taken forward by the EU *IST*[7] and *eLearning* initiatives.[8]

Significance for Ireland

Given the emergence of the digital economy and the politicisation of the schools' IT issue in

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4   See Roberts, L. in Austin, Galvin and Mulkeen (2000) for an account of the programme, 1996-9; and see Levine and Darden (2000) for an account of a recently completed review of the programme.

5   For more detailed discussion, see: *Designing Tomorrow's Education: Promoting Innovation with New Technologies*, COM(2000) 23 final.

6   Cresson, E. (1996: 11) in *Towards a European Electronic Network for Schools*. Conference Proceedings. Brussels: EU DG22.

7   See http://www.cordis.lu/ist for details.

8   See Directorate-General for Education and Culture (2000), *EDUCATION AND CULTURE: Guide to Programmes and Actions*, p 49.

Europe and beyond, it is not surprising that 'something happened'. Indeed, the period 1994-7 was marked by a number of seminal national and trans-national initiatives as the governments of economically advanced countries and other stakeholding agencies sought to come to grips with the implications of living and profiting in an information age. Information society commissions and forums proliferated globally. Many of these were to play highly significant roles in the pursuit and articulation of government ICT policy, at the schools level as well as the general. Ireland was no exception to this trend and the highly regarded IS Steering Group Report[9] was influential in educational thinking on ICT and clearly benefited from the involvement of a number of educationalists in the drafting process.

In brief: an increasingly 'strong-state' analysis was evident in the newly elected government's action on IT and, critically, the 1996 EU call to action focused both political and Department attention on the readiness of the Irish education sector for ICT-related intervention. *Schools IT 2000* was part of the outcome.

What We Needed

At its most essential, what we needed was a school-centred initiative which sought out ways of permeating ICT through the curriculum, and did so across the entire age-range of compulsory schooling.

We needed imagination, time, and significant and sustained investment in cutting-edge projects and people: —

Imagination because the scope of what was involved was unprecedented. We needed to envision ways that would draw teachers to the new technologies and positively encourage pedagogical experimentation. Teachers' imaginative usage of ICT had to be fostered and somehow captured for dissemination.

Time because the scale of what was to be attempted was daunting. Ireland's schools were being asked to 'fast-track' through what has taken 20-odd years of IT usage and development to put in place elsewhere. There was a very real danger that the pace and juggernaut nature of promiscuous technicisation could alienate and even disenfranchise the very group on which Schools IT 2000 was targeted — teachers in their everyday professional role.

Significant and sustained investment in cutting-edge projects and people because getting the best possible from ICT-permeated education required enthusing and empowering a whole generation of teachers with belief in the power of ICT to help educate. This was not just about change it was about the acceptance of change. As Roy (1997: 279) so pithily remarked: "Change is one thing. Acceptance is another." Investment needed arguably to be significant and sustained so that robust and confident demonstration of learning gain was possible and so that a leading-edge group of education ICT practitioners would be formed. These alone were likely to prove a highly effective driver of future development.

What We Got

We got *Schools IT 2000:* a major, government-endorsed initiative under-pinned by substantial private sector investment. In fact we got the biggest investment in living memory in any one specific educational initiative in this country. We also got the National Centre for Technology in Education (NCTE) which over the lifespan of *Schools IT 2000* has aggressively pursued an agenda for the integration of information technology into schools, as outlined in the so-called 'framework document'. We also — eventually — got the nation-wide team of ICT Advisors, and a potentially influential DES-based Education ICT Co-ordination Unit.

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9   Information Society Ireland: Strategy for Action (1996). Available from ISC (Ireland) at http://www.isc.ie .

It would be easy to pick fault with the 'rolling-out' of some components of *Schools IT 2000.* But it is also easy to forget that nothing on this scale has previously been contemplated, never mind attempted, by a Department which The Cromien Report has since described as bereft of forward planning or strategic thinking.[10] It would also be easy to overlook the range and scale of the NCTE's impact on the task of infusing ICT into schools up and down the country.

The reality remains that the NCTE has delivered on the impossibilities of *Schools IT 2000* to a commendable degree. This can be seen particularly in the following ways in relation to the framework's three major initiatives:

The Technology Integration Initiative (TII)

It can be argued that this initiative has not only reached its goals but that it has exceeded the original targets by a considerable degree.

All qualifying schools in Ireland have — at least nominally — been on-line since the end of 1999 and equipment infrastructure at the school level has been improved in line with the original intention of achieving an installed base of 60,000 multimedia computers by the end of the programme. In point of fact the main TII targets would appear to have been well exceeded.[11]
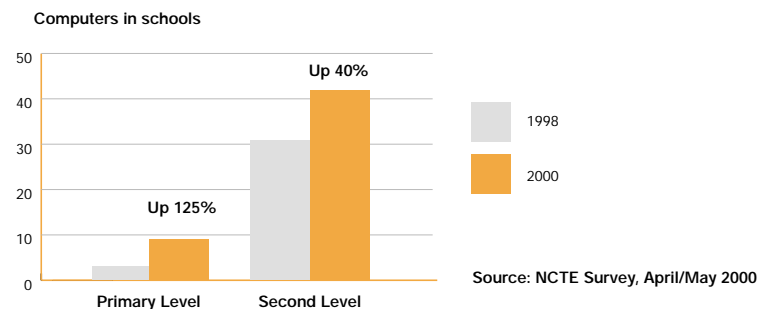

Figure 1: Number of computers, 1998 and 2000

Even a cursory glance at Figure 1 confirms that there has been a significant rise in the number of computers in schools over the life of Schools IT 2000. The number of computers in primary schools has more than doubled with the average rising from four to just under nine per schools — an increase of 125%.[12]

Not surprisingly given that they started from a much more secure baseline, second-level schools indicated a less spectacular but still important rise in the number of their computers, from just above thirty per school to just below forty-four, a rise of 40%.

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10 A report on the structure and functions of the DES by Mr Seán Cromien, former secretary-general of the Department of Finance was made public in November 2000. It is a strong report and as such is likely — if not even intended — to add considerable weight to internal DES calls for department reform.

11 The NCTE has made available to the author data from the national survey conducted by the Centre during April and May 2000. All figures cited in this section of the paper come from that data. No other agency in the public arena has comparable access to schools in order to harvest this level of information.

12 It should be noted that Mulkeen (2000) has indications from pilot work on the national survey that the overall distribution of this equipment is still subject to some geographical and school size factors. Further analysis of the data will undoubtedly help illuminate the nature of such divergences from the national picture.
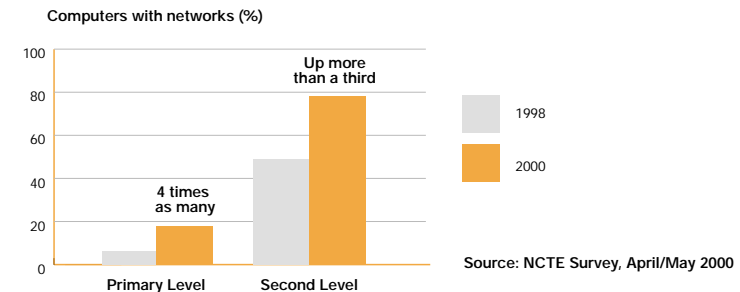
Figure 2: Number of schools with networks, 1998–2000

The number of schools with computer networks in place also rose appreciably over the course of Schools IT 2000. As Figure 2 shows, four times as many primary schools now have a network installed — bringing the total to just under one in five schools nation-wide. Interestingly, the number of networked second-level schools also rose quite dramatically over the same period of time. NCTE survey figures suggest that this is up by more than a third on 1998 levels, with just short of eight in every ten second-level schools now having networks in place, as opposed to just less than half in 1998.

Schools IT 2000 also resulted in a significant narrowing of the gap between the best equipped and least well equipped schools in terms of IT facilities and equipment. Data from the NCTE survey indicate that the pupil to computer ratio in primary schools is now down to 1:18 which compares favourably with Belgium (1:25) and France (1:31) and not too unfavourably with the UK (1:13). The pupil to computer ratio at second level is now down to 1:13 which matches that of Belgium (also 1:13) and compares favourably with France (1:17). However, Ireland's second-level schools would appear to be still considerably adrift of UK figures where the ratio is reported at 1:8 for broadly comparable schools.

In addition, almost three out of every four second-level schools now have ISDN access to the Internet — up from 1:20 in the last NCTE survey.[13] All Ireland's primary schools now have Internet access — predominantly dial-up, but with a small and rising number having ISDN or equivalent.

The Teaching Skills Initiative (TSI)

This initiative is probably the one that has attracted the most interest and comment — both positive and negative — from the media, from schools, from interest groups and from the public in general.

Progress to date has not been without its difficulties. There has been concern about imbalances in the content of some TSI training courses and difficulties in the delivery of some phases and elements. In the main this appears to have been due to the speed with which the initiative was implemented and the unexpected scale of course uptake across the sectors.

Notwithstanding such reservations, the achievements relating to the TSI have been impressive.

The initiative facilitated unprecedented training opportunities in basic IT skills and competencies. Up to three out of four teachers in many schools consequently availed of NCTE organised Phase 1 and Phase 2 training. In excess of 60,000 training days was logged in this way. In addition a number of specialist courses — covering topics such as Web development and first-line maintenance — were run on a trial basis or to meet the specific requirements of local situations up and down the country. SIP Online training would be a good example of this as would the 'tailored' training courses associated with a considerable number of the SIP projects.

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13 Conducted in 1998 by Telecom Éireann, but never published.

In brief: a significant start has been made as a result of *Schools IT 2000* on the journey towards providing teachers with access to the skills necessary to set about integrating ICT usage into teaching and learning. Good progress has been made in relation to the development of a progressive pathway to ICT proficiency for teachers who wish to pursue this. Also, as a spin-off from the TSI, an increasing number of colleges and universities have begun to provide education-specific graduate level courses on ICT or course modules with an education ICT focus.

The Schools Support Initiative (SSI)

The underpinning aims for this initiative were to provide schools with the continuing support and advice that they would need to make effective ICT usage in the classroom a common reality rather than a rarity.

Consequently, a principal focus of the initiative has been the development of ScoilNet — a joint DES/ Intel venture overseen by NCTE, which is intended to become Ireland's national Web portal and a platform for future development in open and distance education for teachers on an individual and group basis.

ScoilNet has made considerable progress towards achieving its target as Ireland's premier education portal, and as the Irish hub in an ever-expanding EU network of networks. Much remains to be done, however, in relation to its intended distance education, information and support aspects.

It is without doubt the Schools Integration Project (SIP) strand of the SSI that has been the most adventurous aspect of *Schools IT 2000* in its approach to teachers and teaching, and in the way it sought to initiate and grow change in education ICT usage and facility. So much so that SIP was subsequently designated an initiative in itself.

In short: ICT-driven education change is a world-wide phenomenon and — without doubt — ICT capability is on the way towards becoming a professional requirement for all career-teacher. The *Schools IT 2000* initiative was by and large seen as a once-off, wholesale intervention into ICT usage and infrastructure at the school level. It will inevitably have its detractors given the scale and cost of the intervention, and the controversial nature of its basic premise — that ICT can in some ways radically transform education in Ireland.

Nevertheless, NCTE has exercised its remit within the framework document to the full and, by and large, Irish schools are consequently on the cusp of that possible transformation.

SIP — Unfinished Stories

The variety of approach and content illustrated by the papers in this volume is adequate support for the claim that there is no such thing as a 'typical' SIP. Clearly, each project is a unique product of the interests and abilities of the people involved, and the localities in which the projects themselves are set.

However, one of the only substantive pieces of research to address the early stages of SIP nationally would suggest that a number of issues emerge repeatedly across the project in terms of the success and difficulty that individual sites may experience.[14] In terms of the lessons to be learnt from SIP, two of these would seem particularly important: technicality versus sustainability, and meeting the challenge of replication.

Technicality versus Sustainability

Galvin and Mulkeen (2000) describe a significant number of SIP projects as "high tech" focused, in the sense that they are primarily experiments in the technology infrastructure of the school. They

address, among other issues, network solutions, intranets, video-conferencing, wide-area networks, and so on. A defining characteristic of these projects is their heavy reliance on technical infrastructure and technology-dependent intervention into the teaching and learning activity. Many of these projects require very high levels of technical sophistication, and so have needed hours (and in some cases weeks) of technical work on the part of the SIP co-ordinator — work which the project team may not have foreseen or fully appreciated and which may even have proved a serious challenge to the viability of the project. Indeed, technical support is a recurring issue across SIP but particularly so at the high tech sites.

A second group of projects are described as centring on relatively lower tech equipment, typically laptops, data projectors and digital cameras. While these projects require a degree of training and familiarisation activities for teachers, the relative simplicity of the technology allows for faster induction and project initialisation. These projects have typically been able to focus more quickly on the curricular part of their task. In short, they have been engaging earlier with the pedagogical challenges of ICT usage within their chosen area. Galvin and Mulkeen (2000) suggest these may reasonably be characterised as "high teach" projects.

Projects of both natures have much to tell about sustainability.

As the initial capital costs of projects have been met by the SIP programme, the recurring cost is likely to be relatively small, and so it is likely that most of the SIP schools could afford — in equipment terms — to continue to run the project beyond the funded period. With the 'high teach' projects, the limit to sustainability is likely to be the imagination to devise appropriate and novel activities which can engage pupils and teachers alike in ICT-enhanced teaching and learning. Ripple effects from ICT usage in 'high teach' ways is also a very real possibility. For the 'high tech' projects, the threat to sustainability is twofold and appreciably more significant: firstly there is the question of the recurring capital cost on project equipment. Secondly, there is the issue of technical skills. Many of these 'high tech' projects rely on individual teachers with unusually high levels of ICT skills, and if they should leave it is questionable whether the schools would be able to continue to manage the technology. Innovation fatigue is also likely to figure in these settings in the longer term: that it has not already begun to do so reflects great credit on the teachers and schools involved.

The Challenge of Replication

Galvin and Mulkeen (2000) also observe that it seems increasingly probable SIP may prove the most effective and influential agent in disseminating the sort of changes in teaching and learning sought in *Schools IT 2000*; and that consequently, documenting and evaluating the SIP experience at the level of the school is critical. Essentially, if the lessons, practices and materials emerging from the projects are to be spread effectively throughout the Irish education system, the SIP experience must be characterised by on-going, systematic recording, collating of information and analysis. At the time of the original research, there were clear indications that appropriate documentation at project level was not happening on anything like the scale that it might have been.

A number of developments have since taken place which may begin rectifying this problem:

NCTE sponsored a series of regional workshops on project evaluation which placed considerable emphasis on the advantages of action research as a means to take stock of progress and outcomes.[15] An increasing number of SIP schools are involved in public presentations and 'launches' of their work which may encourage replication on a wider regional or even national basis. Additionally, several of the larger projects have called in the assistance of peer and/or academic researchers to help with the evaluation of process.

Regional and national symposia — such as the one from which the papers in this volume are

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14   See Galvin and Mulkeen (2000) which is included as a background paper in this volume.

15   These have been facilitated by Jean McNiff who is well known for her work in this area.

drawn — are also likely to play an important role in the dissemination and replication of good ICT practice catalysed by SIP at school level. Participation in education conferences at the national level and beyond is also likely to help in this.

All of the above are likely to assist in mapping out the SIP experience, but these are only a beginning. The systematic, on-going recording, collating and analysis of site data is simply still not happening to the degree it should. A fully articulated evaluation of the SIP experience — from school to national level — remains the best hope of ameliorating this situation. Given the intensely school-driven nature of the SIP initiative, that is likely to prove a formidable and costly challenge. Nevertheless, it would seem unavoidable if we are not to lose what is presently there for the taking, and that would be unforgivable.

Where Next. . . ?

Schools IT 2000 is now officially at an end and while the initiative has been a powerful vehicle for change in education ICT in Ireland, it has left in its wake a number of unfulfilled expectations and uncompleted activities. Inevitably so — given the scale of what was attempted. Unfortunately, the ragged denouement of the initiative is also witness to the movement of education ICT from the centre stage of political interest and patronage, at least for the present.

We are left therefore in something of a difficult situation. The critical mass needed to carry ICT forward is not yet fully secured but we have reached — and far exceeded — the point where turning back is an option.

So where do we go from here? How do we move beyond *Schools IT 2000*?

We could do a lot worse than to begin with the following:

Address Sincerely the Issue of Technical Support

The issue of technical support has emerged across SIP and *Schools IT 2000* more generally as the greatest barrier to further progress. Quiet simply, the broad majority of schools in Ireland are not staffed to deal with the level of technical difficulty involved in running even the most basic computer network which meets the increasingly complex needs and demands of ICT usage in the school setting. Teachers — on whom the responsibility for cobbling together solutions rests in most settings — are increasingly unlikely to continue acting as interim technical services; nor is a funding structure in place that allows the contracting-in of the necessary services. We would seem to have reached the point where enthusiastic ICT amateurism — for all its merits — can take us no further.

SIP has a significant amount to say about ways forward. A number of the 'high-tech' projects addressed the issue directly and others have experimented with various ways of 'buying-in' IT support and system maintenance services. NCTE has also trialled a number of on-line and help line approaches from which we can learn much.

In the short term, the DES may need to find ways to encourage and empower teachers to help maintain the current levels of schools' ICT infrastructure that have, by and large, resulted from *Schools IT 2000*.

In the mid- to longer-term however, it is only through the provision of a comprehensive, nation-wide ICT technical support system and the appointing to schools of ICT technicians that the full possibilities of education ICT can be realised. We need to move quickly to understand the benefits and costs of managed services and public private partnerships — the routes that have been taken elsewhere in search of answers to this specific issue. But we need to be aware of the problematic nature of these as well as their strengths. The experiences of colleagues in Northern Ireland should serve as a timely warning in this regard.[16]

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16 The collapse of the *Classroom 2000* project negotiations show just how complex and unpredictable the PPP situation can prove for all parties.

There also needs to be a new professional presence in our schools to establish, maintain and support ICT activity. Schools ICT technicians graduating from appropriate third-level courses and aware that their work is underpinned by attractive career structures and financial incentives, are the key to sustainable education ICT gain. Without the dependable ICT environment that such technical expertise can provide, the pedagogical and curriculum expertise that the teacher brings to the equation remains seriously diminished.

Address Sincerely the Issue of ICT Integration into School Curricula

The effective integration of ICT into schools' activities depends on two things; teachers' ICT fluency, and the ready availability of high-quality materials for teaching and learning appropriate to the Irish setting and context. Neither is sufficient on its own.

The SIP experience would also have much to say about this. One is struck particularly by the level of impact 'targeted training' seems to have had on the projects. NCTE Phase 1 and 2 training took participants a certain distance but it was the additional edge offered by project-specific training that added real value to the work. Almost invariably, this training was based on an agenda set by the project schools themselves, to meet the particular requirements of their individual settings. The dedication and interest this generated certainly carried a number of projects through barriers that might otherwise have derailed them.[17]

Inevitably the issue of training will figure highly on any DES action list following *Schools IT 2000* and this is clearly necessary. For it to be truly effective though we must be prepared to develop and support a much broader range of ICT usage courses than to date. These courses should include the basic Phase courses which are likely to be required in some form for some time yet, but they should also include short, funded, wholetime courses that address the integration of ICT into specific subject areas and programmes across the primary and second-level years. The localisation of this must also be addressed. If SIP tells us anything about training for classroom and school-level impact, it must be that the targeted or localised, whole- or part-school approach to ICT training is one that we ignore at considerable peril.[17]

There are also strong arguments for making funding and secondment available to allow teachers attend full-time post-graduate level courses in education ICT, in this country and beyond. The possibilities opened up by the emergence of a sizeable group with a firm grasp of education practices in this county and the professional benefits of advanced study in education ICT, are intriguing.

In a system not given to such pro-activity, none of this will happen without substantial prompting.

What may happen a lot more readily is action on the issue of high-quality materials for teaching and learning appropriate to the Irish setting and context.

One of the most impressive outcomes of SIP activity up and down the county has been the quality of resource materials that projects have assembled and published. The relevance to the curriculum of a considerable amount of this has been astonishing. So too has its transferability to other teaching and learning settings. Of this material, some of the most striking has been Web-hosted. It is particularly interesting therefore to note the following from a major report on the Internet in education published recently in the US:

> "Web-based education is just beginning, with something of far greater promise emerging in the middle distance. Yet technology, even in its current stage of development, can already allow us to realistically dream of achieving age-old goals in education—To center learning around the student instead of the classroom; To focus on the strengths and needs of individual learners; To make lifelong learning a reality." (US Government Web-based Education Commission, 2000: 4)

Put another way: one of the unforeseen outcomes of SIP has been a strong confirmation of the power of the Web for teaching and learning in Ireland, and a glimpse into its possible future uses in

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17 See, for example, Kennedy, and Lawson; this volume.

our schools. We have in this country a number of world-leaders in the development of both content-rich and content-free Web education platforms.[18] We also have the lessons derivable from the ScoilNet aspect of *Schools IT 2000* and spin-offs from this — such as Ireland's involvement in a considerable number of EUN Internet projects. It would take very little prompting to turn these resources into a flexible and cost effective means of generating and delivering to our schools, learning possibilities based on Web materials tailored to the Irish education context.

Address Sincerely the Issue of Researching ICT Policy and Usage in Schools

Internationally, the place of research in advancing the use of ICT in schools is secure and clearly articulated. For instance, in its current strategy document on the place and role of education ICT[19] the Finnish Information Society Commission states simply and categorically:

"A sustainable information society must be based on solid research." (2000; Section 2.1)

It then goes on to underpin this statement with a ring-fenced budget allocation of 1 million Euro to cover monitoring/evaluation of development in education ICT over the life of the programme.

Similarly, among the core objectives of the highly regarded ESRC (UK) *Teaching and Learning Research Programme* are commitments to:

"develop the capability for transforming the knowledge base relevant to learning into effective and efficient teaching and training practices; and

enhance the system-wide capacity for research based practice in teaching and learning."[20]

TLRP has a remit far beyond the impact of new technologies on teaching and learning in schools, but its emphasis on turning knowledge into practice through a system-wide capacity for research is significant.

In each setting, partnership between practitioners and researchers in undertaking focused and relevant research and in making sure this has demonstrable impact on future policy is seen as a key feature of progress. The net result is that each setting — albeit in different ways — is supportive of research which focuses particularly on practice in such a way that it critically informs and promotes future change. Such practice-based research can be of considerable assistance in policy articulation and development if used well.

It is somewhat disappointing therefore that we in this country have not set more systematically about researching ICT usage in our schools and the policy which informs this. There has of course been research into the area but it has been largely fragmentary, unconnected and even at times left unfinished or retained (unpublished) by the sponsor.[21] This is a situation that we must seek sincerely and urgently to address if we are not to be locked into ill-informed, unrepresentative and non-transparent policy making for this critical area of education.

The convening of an active policy forum on education ICT — either through the energising of the National Policy Advisory and Development Committee or its replacement — would represent a significant first step. If matched by the DES commissioning a tranche of policy-orientated research — particularly practice-based research looking at the activities of SIP schools and other leading-edge projects — these together would provide an excellent basis on which to start the process of building good education ICT policy on strong and informative research.

Address Sincerely the Issue of SIP Extension

The issue of possible SIP extension is not likely to have been among the priorities of those who

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18 *Riverdeep* and *SmartForce* are two that come immediately to mind. There are, of course, a considerable number of others.

19 See *Education, Training and Research in the Information Society: A National Strategy 2000-2004*. http://www.minedu.fi/julkaisut/information/englishU/2/1.html

20 See, TLRP Core Objectives at http://www.tlrp.org

21 For instance, the NPADC Report due for publication in autumn 2000 finally appeared late in 2001 and the *eircom* IAS programme evaluation never appeared, and the DES Expert Group on Schools ICT Infrastructure and Usage ceased meeting.

originally planned and scoped out *Schools IT 2000*. Its profile was possibly not high enough in relation to the other major elements of the initiative, or more plausibly, it was not expected that any aspect of the initiative would run beyond the year 2000. This is rather unfortunate. As Galvin and Mulkeen (2000) observe a last-moment decision to move from a forty *school* to a forty-plus *project* scenario — eventually encompassing nearly ten times that number of schools — meant that it was April 1999 before SIP was formally launched, and September 1999 before work could begin in earnest for many individual project sites.

Fifteen months is unlikely to have been enough for a considerable number of project schools to plan, resource, implement and evaluate ICT related innovation in teaching and learning. It certainly was not enough to put in place a comprehensive evaluation framework on the scale that the project deserved. As suggested earlier this has resulted is some unfinished stories. But it also resulted in a significant number of complete ones — following a refocusing and resetting of agendas that was hugely demanding of time and effort for the teachers and schools concerned.

Given this, the achievement represented in this volume is all the more impressive.

If any single aspect of *Schools IT 2000* has caught the imagination of a significant section of the teaching profession in Ireland over the past few years it has been SIP. And if any aspect of the initiative deserves life beyond the intended close of programme, it is most likely SIP. The hunger to participate, the scale of interest that SIP caused among schools is difficult to encapsulate and the dedication shown by the project's national co-ordinator and NCTE's SIP team, equally difficult to describe. The well of creativity and pedagogical gain that the project tapped is impressive in any analysis and may yet prove unprecedented in terms of curriculum impact attributable to a single intervention into the Irish education system.

It would be a brave and remarkably insightful decision on the part of the DES to fund the extension of SIP to completion and evaluation of all work associated with the project. Much still remains to be done in a number of SIP settings, and a considerable amount could be learnt from what schools that have brought closure to their SIP do next. Sadly, it may already be too late for this. A number of projects have now folded, and others are likely to do so over the coming weeks and months as they complete their work or as interest and enthusiasm for SIP wanes and the possibility of future funding recedes.

In any event, a comprehensive national evaluation must be undertaken and whatever support and funding remains attaching to SIP must be allocated to the continuation to closure of as many of the projects as possible. To do otherwise would be to break faith with those teachers who have given so much of their time and effort to make SIP happen in their schools.

We must also give attention to the challenge of disseminating the outcomes of SIP: a challenge that will prove interesting given what has been suggested earlier about the problems attached to replication. National and regional conferences will likely play a roll in this, as will Web dissemination. But peer-to-peer and school-to-school methods should also be considered due to the intensely situated nature of much of the materials involved.

In brief, there is a very considerable amount to be learned from the experiences of project schools to date — regardless of the prospect of project closure or otherwise. Given the current political climate in relation to education ICT the best we might hope for is the prioritising of an effective evaluation of the work completed by projects which have achieved their goals. However, the history of SIP has been one of school-level pro-activity on an unprecedented scale, and so it is probable that we will soon see the emergence of innovative and useful proposals for ICT activity which take forward or in some other way build on what has been achieved by individual SIPs.

Ironically, the unexpected legacy of SIP may be its refusal to ever really end. It is difficult to abandon success.

A Closing Note

At the outset, it was stated that this paper seeks to open a public debate on how best we can move beyond *Schools IT 2000.* This will be an important debate for a number of reasons, principally these three:

First, the arrival of ICT as a force for change in the classroom is still seen by many colleagues as impositional and disrespectful of their professionalism as teachers in that it seeks to 'upgrade' seemingly without any concern for existing teaching manner and expertise. Finding a workable balance for all — somewhere between accommodation and encouragement — will take considerable thought and effort. But we owe it to colleagues to seek this out — the arrogance of the 'dotcom' mentality is not part of what we should want to integrate into our practice as educators.

Second, there are very considerable implications — both philosophical and financial — involved in going digital across the education system. Without sufficient thought for the longer term impacts of a policy of promiscuous technicisation we could be heading for a situation where our core values as teachers are undermined in subtle but important ways. Writing about the Australian experience, Snyder captures perfectly the reservations I would feel when she comments "… perhaps it is wise to step back from the rush to acquire fibre-optic cabling, hardware and software, to ask value questions about how we should learn and teach as well as hard-headed financial questions about cost effectiveness" (1998: 23). Perhaps so, and better now than later. While there is much to champion in the value of education ICT and I myself would be an advocate of ICT-enhanced teaching and learning experiences, we need to take a careful and honest look at the cost of being digital as well as the cost of *not* being so. Our education system must only bear the burden of this if we are certain in heart that the cost is one worth paying.

Finally, there is the lingering question of how best policy can be made and pursued regarding education ICT. The DES finally put in place the ICT Co-ordination Unit promised in the framework document underpinning *Schools IT 2000.* This is an exciting move and one which opens up considerable possibilities. If there is one key lesson to be drawn from the Schools Integration Project element of *Schools IT 2000,* it must be that leadership and vision from the centre can be a powerful force for change but only when matched by enthusiasm and real ownership of an initiative on the side of the school. Real ownership means having a voice that is heard and taken seriously, because it speaks with an authority that deserves attention, and having control over the destination of change, as well as the pace and ways in which it is pursued.

Curriculum innovation has seldom if ever been pursued so effectively on such a timescale in this country. That represents considerable credit for the role the National Centre for Technology in Education has fashioned and pursued in relation to its central mission. It also celebrates the professionalism, abilities and interest of the teachers involved in SIP. Finally, it represents a wonderful starting point from which the Department of Education and Science can now set about building the kind of research and practice partnerships that will radically influence the ICT-enhanced classroom of the future and the nature and detail of teacher professionalism in Ireland for a generation to come.

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Publishing Progress: The Development of *SIP Online*

Breeda Meleady

Introduction

The last few Schools Integration Projects are now approaching completion. SIP Online is essentially a portal to host the resources that many SIP projects have developed and to carry accounts of the experiences and developments associated with each. Many, of course, have developed local Web sites as part of their work but the idea of a single 'one-stop' national site which draws together a lot of the work to date and offers a direct route to these individual sites is attractive. Resources that might otherwise be hard to find become more accessible, and we also have ready access to valuable accounts of effective ICT usage. We believe that the dissemination of such material will provide opportunities for teachers not directly involved in SIP to benefit from the experiences captured by *SIP Online* and so enhance and develop their own ICT.

Essentially the development of an NCTE/SIP Web site is a first step towards answering the challenge of evaluating and disseminating SIP results and outcomes.

The bulk of the resource materials expected to make up the site will most likely take the form of lesson plans, worksheets, accounts of learning experiences, tips for teachers and suggestions for innovative and effective ICT usage. Many of the SIP projects have reached the stage where evaluation and dissemination is becoming more a key activity. *SIP Online* is intended to capitalise on the resources these projects are producing, and also to assist in the evaluation and dissemination process itself.

Aims and Objectives

In formal terms the main aims of *SIP Online* can be stated as:

- to disseminate the results and outcomes of SIP to the wider educational community
- to develop a portal to host resources and to document good ICT-enhanced classroom practice
- to begin the process of publicising more widely, collateral changes in teaching and learning that are emerging across the SIP schools

Content

It is proposed that the most significant dissemination of material produced in SIP will take the form of online resources hosted on an NCTE server. Such an approach will make these resources easily accessible to all interested parties and will provide those schools that are ready to present their findings with a valuable medium in which to disseminate their results, experiences and other relevant materials.

Early work on the site suggests that schools are particularly keen to share content. We are likely to start therefore with a body of materials which includes:

- teaching resources
- software evaluations/reviews

- tips for teachers
- ideas and suggestions for effective ICT usage
- useful links to other Web sites
- information on making a school Web site/Web publishing

From the outset, the design of SIP Online has emphasised the need to provide a resource section of the site which allows for the exchange and the dissemination of learning experiences, many, though not all of which, could be termed ICT/technical. Under a 'theme' section, accounts of useful experiences of effective ICT usage will initially include:

- network management
- using a digital camera
- experiments with the scanner
- effective classroom usage of Web-based resources

Navigation and Layout

SIP Online is located at www.sip.ie. Individual project homepages are hosted under the form www.sip.ie/sip001 with the 001 appendix representing the formal SIP reference number NCTE assigns to each project.

A common look and feel is being developed for the entry levels of the site — each individual set of SIP pages will have a cover/splash page with a similar layout and the architecture of each will share common elements. For instance, each will contain project rationale, links to the project's own site(s) and those of partner schools (where applicable), links to NCTE/SIP site and ScoilNet, direct lines to project resources, details on project aims/progress/outcomes, and — in time — links to evaluation reports and other publications associated with the project. Taken together, these will represent a formidable account of SIP and its work.

Of course, *SIP Online* is primarily intended to reflect the volume, range and diversity of schools involved in SIP and so — certainly below the entry level pages — will be structured appropriately to accommodate the findings and outcomes from the various projects. We will consequently allow for a number of formats and themes to be included. This will reflect the spirit of diversity which characterises so much of what SIP is all about.

The SIP Online Challenge

The challenge of achieving the level of presence and content that *SIP Online* aspires to is, of course, a significant one.

We have addressed this in the first instance by organising training in Web usage for all SIP co-ordinators. This takes the form of a two-day course, focusing on the use of ScoilNet discussion groups, the practicalities of uploading material to the Web, and the use of *DreamWeaver* — a Web authoring package. Training materials included a copy of DreamWeaver, WS_FTPLE ftp software and Paintshop Pro graphics software.

Nine SIP co-ordinators with particular proficiencies and experience of schools' Web design were recruited to provide SIP Online training nationally. Venues were regionalised: courses were arranged for Cork, Ennis, Sligo and Dublin. A similar course was organised for NCTE ICT advisors, based at Education Centres up and down the country. (This we felt was important because of the role these advisors play in regard to SIPs in their areas.)

As things stand it is primarily the co-ordinators of each SIP who supply the project materials for SIP Online. There was the possibility of nominating a teacher in a participating school to take up this challenge but it is mainly the co-ordinators so far who have assumed this role.

Summary and Overview

The development of *SIP Online* represents a significant first step in addressing the issue of publishing and disseminating to a wide audience the outcomes of the Schools Integration Project. The site will come in time to contain resources, outlines of SIPs, themes and suggestions for effective ICT usage. Teachers will then have access to ideas that have been developed in an Irish setting and context.

We see *SIP Online* as an important and dynamic influence in relation to developing better ICT-enhanced teaching and learning in our schools. The trick will be to make it also a user friendly and pleasant Internet location.

Section 2: Roundtables
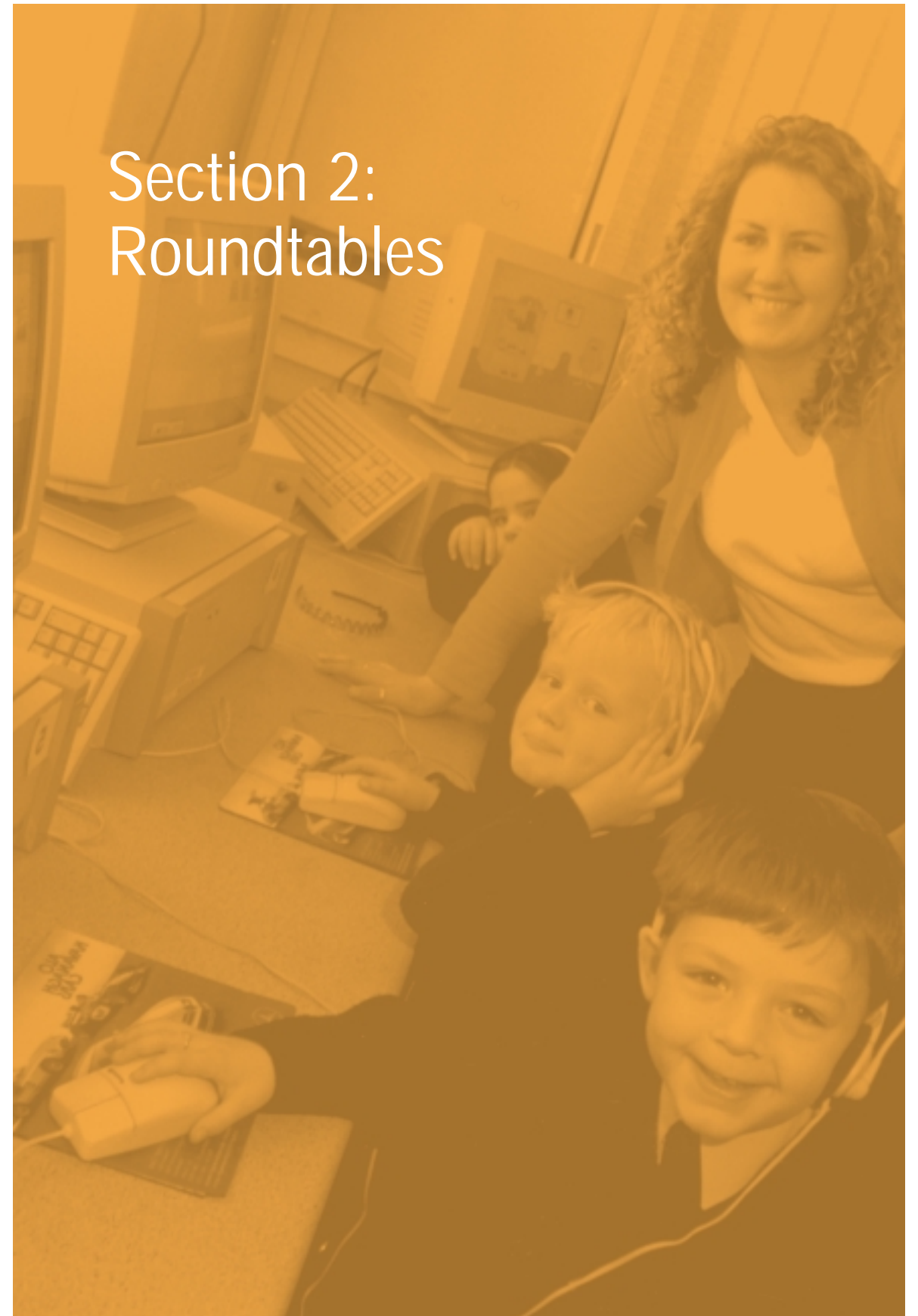
Integration

Deirdre Butler (Chair)
Aidan Mulkeen (Rapporteur)

Notes from the Discussion

A roundtable discussion on the topic of integrating ICT into educational practice was held at the SIP symposium in Portmarnock in December 2000. The roundtable had an attendance of around 30 people, and very lively interaction, particularly on the last part of the topic. The group was asked to consider integration in three stages:

- What do we mean by integration?
- Have we any examples of good practice, integration?
- What are the issues impacting on integration?

What do we Mean by Integration?

Integration was seen in terms of making ICT part of the teaching/learning process, and reaching the point where there would be less emphasis on the technology and more on the learning. The group commented on:

- normal usage, using the computer as a tool
- the confidence NOT to use ICT when appropriate
- when the computer is so normal that it is not seen

There was a concern about the level of technology, and the risk that the benefits might not reach all learners. Participants noted that real integration could only occur when the computer is instantly accessible and so it is important to ensure equality of access for all

The group noted the potential of ICT, if integrated, to change the nature of education. There was discussion of the way that ICT could facilitate:

- meaningful, purposeful integration
- ownership by the children
- learners controlling the learning process

Other participants thought of integration external to the school. The ideas included:

Social integration, with students from different backgrounds working together using ICT. A specific example was provided involving an island school using ICT to forge links with mainland schools. The possibility of global linkages between schools enhancing understanding of other societies and cultures was noted.

Another area where integration is needed is in the linkage between the primary and post primary sectors.

One participant had come to the workshop with a different perspective, and pointed out that integration is used in the context of special needs with quite a different meaning. He pointed out that in considering integration, we should also consider the potential of ICT to allow learners with special needs to integrate with mainstream learners.

Examples of Good Practice in Integration

Using this vision of integration as a template, the group considered some of the examples of ICT practice presented in the symposium. Some of the projects noted were:

- the religion CD, which had motivated students to study religion
- the Hamlet bulletin board (SIP 11)
- the open-ended collaborative story (several SIPs)
- the use of CuBase in Music (SIP 33)

The group stressed the benefits of these activities, particularly:

- the motivational poser of ICT, and the excitement and enthusiasm of the learners
- the potential to enhance learning by making the topic interesting and active
- the use of ICT to enable teachers to be more creative
- enabling teachers to do things they could not do before (e.g., Geometers Sketchpad)
- making learning that allows for different learning styles and uses all the senses
- allowing collaborative learning
- making an environment where exploration is okay, because it is safe to fail (it is easier to give a wrong answer to a computer than a teacher)

Issues Impacting on Integration

The main focus of the discussion was on the training of teachers in ICT. Some argued that the existing training was focused on skills and had not enough emphasis on the pedagogy and the kind of vision of the potential of ICT described earlier. Others felt that teaching basic skills was an important first step, and that the pedagogy could only come after the basics had been covered. There was a discussion about whether teachers could develop ICT skills in an integrated fashion. It was agreed that finding the right balance between these two is very important.

Some other points made in connection with the issue of training were:

- Ideally it should not be called training. Training implies pure skills. We are talking about something much broader.
- The pre-service area is vital. If ICT is not included in pre-service teacher education then you have to 'catch them again' later.
- If we are talking about a vision of ICT, then this is not just an area confined to teachers. There is a middle layer of school principals and boards of management who make the crucial decisions, and there is a need for vision building activities at this level.

A second area of concern was the curriculum. The lack of ICT guidelines in the revised primary curriculum was noted, and the need for work in this area was stressed.

Some participants questioned whether the DES had an integrated vision of ICT in education. They pointed to the difficulty of having a school ICT plan when the grants from the Department were unknown, and the Department had not made guidelines or future direction clear.

Finally some participants called for a serious drive for dissemination, noting that great work was being done, but that this was not widely known, and needed to be highlighted in other schools, in the media and at cabinet level.

Professionality

Séamus O Canainn (Chair)
Janet Moody (Rapporteur)

Notes from the Discussion

When representatives from approx. 30 SIP projects gathered in Portmarnock in December 2000, a roundtable discussion took place on the notion of teacher professionality as it might influence the use of ICT in education. The discussion on professionality covered a wide range of issues, but focused mainly on the role of the teacher and the ways in which this might be effected by the increased use of ICT. The group also discussed how the SIP projects enabled teachers to reflect on their practice and whether ICT increased possibilities for teachers to become a community of learners.

The group began with a discussion on the role of the teacher. Various roles were put forward, including facilitator, learner, technician. The immediate reaction to these was that the teacher as disciplinarian was another key role: some felt that the issues of discipline and order were as important as ever. A high degree of organisation was required by the teacher in an ICT-rich environment, including good preparation and checking of software. Did this mean that the teacher was becoming simply a manager? No, but the consensus was that organisational issues needed to be resolved before anything worthwhile could happen: organisation was the key to fostering creativity with ICT. There were, however, different understandings of organisation: one teacher described how her Maths students learned by investigation and were responsible for their own learning, with the teacher as guide. "They were doing their own thinking". This freed up the teacher to help those who needed individual help.

What therefore does being in control mean? How does this link with the teacher as facilitator? Some participants emphasised the central role of the teacher while others felt that a new organisational style was necessary with ICT. One participant queried whether students were in fact independent learners. One response to this was that students had not been encouraged or enabled to become independent of the teacher. It was considered that students also needed considerable guidance; teachers could not be expected just to stand back and allow pupils to learn independently, particularly in learning environments using the Internet. The use of the Internet as a learning tool meant that a strong emphasis was needed on developing thinking and judgement skills as well as selection and research skills.

The teacher was no longer the font of all knowledge: machines could transmit 'knowledge' more efficiently than the teacher but this could be seen as an opportunity rather than a threat — a move away from rote learning. One participant considered that the advent of ICT gave teachers the opportunity to create the role of teacher anew. The widespread availability of learning resources using ICT could also create a dilemma for teachers if they wished to maintain an authoritarian model of control.

Encouragement of learning 'how to learn' would be an enhanced part of the teaching role. There was still a sense in which students found it hard to function as independent learners although the use of ICT meant that students were more keen to learn on their own.

The privacy of the teacher was gone: they have a role in a larger learning community and have the opportunity to give leadership. SIP projects needed to be seen by the entire community. The use of computers created an additional responsibility in relation to parents. On the one hand, parents sometimes needed convincing that computers were appropriate tools for learning while they also continued to have high expectations of teachers as the people who ensured academic success for their children.

The group also discussed the extent to which SIP encouraged reflective practice. Did the SIP projects enable teachers to reflect on their own practice and thereby extend their own professionality? One participant considered that you had to start with practical issues, and that as teachers became more confident with using technology, more reflection took place. There was also a danger of focusing on the practical issues in the setting up of a SIP project, without sufficient time for reflection. Participants felt strongly that SIP projects were a worthwhile form of professional development but there were differing views on the extent to which they enabled teachers to reflect in a deep way on their own practice.

The SIP projects have enabled some dissolving of boundaries and increased partnership between parents and teachers. Parents were responsive in terms of ICT initiatives but the possibility of further increasing links with parents through ICT might make some teachers rather nervous.

Having discussed the possible ways in which ICT might affect the role of the teacher, the question remained: Is the teacher not the expert educationalist? Do we, as teachers, have to relinquish this role? Is teaching the only profession in which others tell us what to do?

There was a sense that much, in fact, remains the same: these were not so much new questions, but old questions in new ways — questions of control and classroom management, and of organisation of student learning. The role of the teacher would continue to change and move away from that of transmitter of knowledge, but there was a strong sense of realism in relation to practical and systemic issues which would prevent any rapid change.

Section 3: Project Reports

Empowering Minds and Taking Control

Deirdre Butler

Introduction

This paper documents 'Empowering Minds', a project that has established a partnership between St. Patrick's College, Drumcondra, the National Centre for Technology in Education (NCTE), Ireland, MediaLabEurope (MLE), the Media Lab at the Massachusetts Institute of Technology (MIT), and selected Irish primary school teachers and children. In this project, we are introducing LEGO *MindStorms* technology into Irish primary schools along with a framework for teacher professional development that centrally recognises teachers' passions, which it is hoped will open gateways to new ways of learning in schools.

Rationale

Across the globe there is an urgent need to develop and use educational frameworks for integrating ICT into the school curriculum. These frameworks need to be informed by sound educational theories and practices, as technology of itself does not directly change teaching or learning. Therefore, we must encourage a careful and intelligent meshing of educational and technological agendas. Much prior research focused predominantly on the child in the educational environment. We believe a change of focus is required; the key to successful implementation of technology is the teacher.

Attention, therefore, needs to be directed at the 'chief agents of change' — the teachers — and how they view not only technology, but more importantly themselves, the learner, and what is to be learned. Assumptions about the nature of the learner and the teacher in the process of learning will have implications for not only how technology will be used in education, but also for everything that happens within the classroom. The most common uses of technologies in schools today generally reflect instructionist educational philosophies, which view students as recipients of information dispensed by teachers or by technology. Rather than the acquisition of specific skills or knowledge, "the real potential of technology lies in its capacity to support pedagogical approaches that encourage students to become active participants in their own learning and to acquire critical thinking skills and more complex understandings" (OTA, 1995, p.126).

Primarily, we hope that the project will act as a catalyst to challenge the perceptions and assumptions about learning, and we believe it will result in a major change in classroom practice at primary level. Teacher education needs the same conditions as good classroom learning. Teachers need time to experiment, reflect and discuss with others in a supportive learning environment. We believe that the "real promise of technology in education lies in its potential to facilitate (these) fundamental, qualitative changes in the nature of teaching and learning" (President's Report, 1997).

Background

schools were invited to respond to the SIP initiative in October 1998. The four schools selected for the first phase of this particular project (March 1999 to June 2000) are loosely representative of the main school types prevailing in Ireland (large middle class suburban; inner city disadvantaged; medium semi-rural; two teacher rural). There was targeted expansion for the second phase (August 2000 to June 2001) to include more small rural schools and disadvantaged schools as well as some single sex schools and children with special needs. There are now 13 schools and 29 teachers participating in the project. All the teachers volunteered their involvement in the project. The experience level with ICT among the teachers ranges from complete beginner to experienced. The project builds on previous research on educational applications of control technology developed at the MIT Media Laboratory. We are using the commercial version of the MIT "programmable brick" (Martin, 1988; Martin et al, 2000). This is the LEGO *MindStorms* Robotics Invention System launched by the LEGO Group in 1998. The system is based on research conducted at the MIT Media Laboratory led by Seymour Papert. We are also working with teachers/researchers who participated in early programmable brick research (Martin, 1996; Hayward, 1995).

The *Empowering Minds* project was founded with three core principles:

- to encourage children and teachers to develop technological fluency by using project-based learning to bring ideas of design, control, sensing, and programming to children

- to use technology as an integrating agent within the primary school, connecting these new ideas with the existing curricular content

- to establish a new model of teacher professional development, in which in-service teachers are centrally included in the design process of constructing new activities for their students

This paper focuses on the first two of these goals — the ways in which a new technology (LEGO *MindStorms*) can bring new ideas into the lives of children, and in the hands of creatively-empowered teachers, let children explore content in the traditional curriculum in new ways. For more on the overall design of our project and the role of teachers within it, please see Butler et al. (2000).

Project Design

Phase 1	March 1999	An initial workshop with selected teachers, parents and children
		Teachers, parents and children (2 days)
		Teachers only (3 days)
	May - June 1999	Delivery of materials to classrooms and exploratory work by teachers in their classrooms
	August 1999	Second workshop with teachers (5 days)
	September 1999 through June 2000	Full classroom project work
Phase 2	August 2000	Workshop with all teachers from Phase 1 and Phase 2 (5 days)
	September 2000 through June 2001	Full classroom project work

Table 1: Summary of Key Stages

Materials

Our project uses the LEGO *MindStorms* set of robotic design materials. This set of materials includes the RCX Microcomputer (a hand-held computerised LEGO brick that can be built into LEGO models), electronic sensors, LEGO Technic components (motors, gears, axles, and wheels), and the standard set of LEGO building bricks. These materials allow children and teachers to have rich and in-depth explorations of key ideas in control technology, including (but not limited to!) mechanical design, power, speed, gearing, friction, sensing, feedback, software design, and project management.

A significant part of the design experience in working with the *MindStorms* system is the programming of one's model. We evaluated two different software packages for this purpose: RoboLab, marketed by LEGO Dacta (the school division of the LEGO Group), and RCX Code, part of the retail package. The teachers in our project found the RoboLab interface unnecessarily complicated, and chose to use the RCX Code software. (Other programming environments developed by *MindStorms* enthusiasts are available, but these are more suitable for programmers rather than children.)

Teacher Workshops

All the workshops were conducted at St. Patrick's College of Education, in Drumcondra. The teachers entering the project had no experience with the *MindStorms* materials. Some of them in fact had very little experience of working with computers. In the workshops, we immersed the teachers in the sort of design experience we hoped they would recreate for their students. The teachers also made specific requests for the workshop content as they realised the need to develop their own understandings of the principles of building solid structures, how gears worked, etc. We reorganized workshops to accommodate the teachers' expressed needs. The teachers all engaged wholeheartedly with the materials and were so immersed they were often reluctant to leave even for lunch. There were times of frustration as they struggled to achieve their goal. Ultimately, however, they achieved success and the sense of accomplishment was palpable. These experiences opened up many conversations about how to implement this approach in the classroom and how to get the children started — the whole class at once or sub-groups? From the beginning, it was apparent to all that we would be relying on the intuitions and expertise of the teachers to implement classroom models effective for their own particular situations.

Project Descriptions

The project theme chosen by the teachers after much discussion and debate is 'Story, Myth and Legend'. Within this context the teachers and children work and explore their chosen topic extensively from many different perspectives across a wide range of curricular areas including Art, History, Maths, English, Science and Music. The topics chosen to interpret and express have included:

- Táin Bo Cuailnge
- Theseus and the Minatour
- Norman Castle Life
- Castletown House
- The Selfish Giant
- The Haunted Fairground
- Dame Alice Kytler
- The Horse of Troy

Working in this way children and teachers learn technological concepts embedded in the context of relevant and meaningful project work and the traditional curricular content is learned through creative expression. For a more detailed description of some of these projects please see Martin et al. (2000).

Building a Learning Community

In a constructivist classroom, other people are the greatest source of alternative views needed to stimulate new learning (von Glasersfeld, 1989). A key feature of this project is that the teachers and children are externalising their thinking and reflecting on what they are doing and how they are learning i.e., thinking about how they think. All the children are recording their experiences. Some are keeping a log into which they record the models they have built, illustrating it with diagrams and pictures. Others are electronically writing their accounts and also saving digital images of their models in folders on their own floppy disks and on the classroom computer. Each teacher is keeping a journal — ranging from hardcopy to Web pages — in which are included how the project is developing in their classroom, problems they have encountered, and things that have worked particularly well for them. Reflecting on how they are learning and discussing it with the children in the classroom and within the group is providing the opportunity for them to realise that everyone has their own way of understanding. As they work together they are realising the importance of dialogue and the interactions among group members, as they struggle to solve their problem collaboratively. Two things are happening simultaneously: (1) teachers are engaging in a learning environment, and (2) are reflecting on the process of how they are learning. They are learning with technology, not about technology. Technology, if harnessed in this way, could provide the vehicle for lasting change and for improving learning.

The importance of a learning community where ideas are discussed and understanding enriched is critical to the design of an effective learning environment. "Teaching, more than many other occupations, is practised in isolation, an isolation that is at times crushing in its separateness." (Maeroff, 1988, p.3). But "increased communications is one of the biggest changes technology offers. . . to. . . transcend the walls of isolation" (OTA(US) 1995, p. 2). Therefore, if this power of technology is harnessed and used in a collaborative environment, an effective learning community can be established among educators. Current problems of isolation will be reduced, the community of learners widened, and classroom walls, as they exist at present, broken down. To this end a mailing list was set up for all participants in the project. Initially, use of this was confined to the more experienced users of the group. To encourage the use of email as an effective form of communication a 'buddy system' has been established at the summer 2000 workshop. The intention is for teachers to share their own unique experiences, on a regular basis, with someone within the project but outside of their own school.

Removing Barriers

Other research has identified potential barriers for teachers' effective use and integration of ICT within the curriculum. We have minimised these by providing:

- adequate and appropriate hardware (e.g., computers and digital cameras)
- support structures
- appropriate professional development (cf., workshop descriptions and support structures)

Adequate and Appropriate Hardware

The teachers chose to have their schools augment the grant provided, and purchase laptop computers rather than desktop machines. This has been significant in the teachers' development

of computer skills and the subsequent integration of their newly acquired ICT expertise into the curriculum. All of the teachers claim that, without the opportunity to bring the computer home to "tinker around and play with it", they would not have achieved such technical competency. Neither would they have had the confidence to use technology so widely in their everyday classroom work e.g., writing up their journals, sending email, finding resources on the Internet, programming the models, etc. To the teachers, the value of having the computer at home to use on their own time, rather than having to stay behind after a tiring day in school, cannot be overemphasised. This was especially true for the complete beginners who could try things out at their own pace, in their own time and without the pressure of time constraints and other people's eyes.

A digital camera that recorded pictures on floppy disks (the Sony Mavica-MVC-FD73 and MVC-FD75) was provided for each school to aid in the recording of the models the children created. The deciding factors on which camera to purchase were simplicity and ease-of-use. This has paid enormous dividends as all teachers and children are using the cameras confidently and effectively on a daily basis. Their use has not been restricted to the project only as the cameras are being used for a myriad of purposes e.g., school events (sporting occasions/concerts) and projects (insects, flowers, trees).

Support Structures

We organised a variety of support structures to provide the teachers with scaffolding as they embarked on the project and their journey into 'learning with the children'.

Within the Classroom: The constructivist teaching approach was very evident. All of the teachers agree they have never learned so much since commencing work with the children on building their models and helping them solve the problems they encounter.

Within Each School: Two teachers from each school were involved. A 'buddy' system operated, as one of the teachers was more experienced with using technology. Having a supportive environment means teachers can take risks in safety, as they know if something goes wrong a helping hand is always available to provide advice and support. As one of the teachers remarked "having someone in the school or at the other end of the phone takes the fear out of trying out things. I'm no longer afraid to get myself into a mess because I know if I can't sort it out, one of the others will give me a hand."

Across Schools: A small number of schools were selected for the initial phase of the project and good relations and a sense of rapport was built up among them over the course of the workshops. This building of a group identity has continued into the second phase. A key factor was that the teachers from the first phase worked closely with all the new teachers during the five-day summer workshop. They were on hand to answer all queries about day-to-day management and organisational issues, materials, common pitfalls etc. This did much to allay the new teachers' fears and apprehensions and build their confidence. So successful was this, that all the teachers from the first phase remarked that the new teachers did not seem to be as apprehensive and anxious as they had been, before starting work in their classrooms. When asked about, this the new teachers laughed and said that the first phase teachers were all still alive and intact and had all come back for more, so it must be good. This positive presence of the first phase teachers demonstrates the potency of peer endorsement. As the number of schools was extended from 9 to 29 teachers, we have put in place structures to help continue this valuable peer support. Three clusters have been formed with a mix of Phase 1 and Phase 2 schools. These clusters of schools act as a source of ideas and inspiration for each other, as well as providing advice about issues as they arise e.g., classroom management and organisation of materials.

The Project Co-ordinator: The regular school visits and meetings with teachers by the project co-ordinator (Deirdre Butler) provide an opportunity for appropriate skills to be introduced as the need arises. This is an embodiment of what Vygotsky meant by the "zone of proximal development" as we were able to respond to the needs of these children and their teachers and facilitate their development of ICT skills in response to an expressed desire and need. In the second phase the

number (4 to 13 schools) and geographical spread (Sligo, Louth, Kilkenny, Kildare, Tipperary and Dublin) of the schools has been expanded so it is not possible for the co-ordinator to make as many visits to each individual classroom. In an effort to compensate for this we have put in place structures to facilitate teachers visiting the other schools in their cluster to see and experience how others are working. This will provide a platform for cross-fertilisation of experiences, skills and ideas. Regular cluster meetings will also be organised as a way of discussing current work practice, problems etc.

Resource Team: These provide expertise and advice to the group as they have had prior experience of working with the materials in a variety of settings.
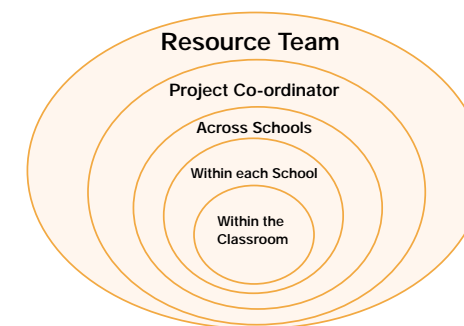
Figure 3: Support Structures

Conclusions

In this project, the children in the classrooms have been given both a technologically expressive set of materials as well as the guidance of committed and capable teachers. The children conceived and implemented projects that incorporated crafts, mechanics, sensing, control and programming. The teachers in the project supported the children's work in several ways. They provided a narrative context for the children's work, but also, underwent a learning process themselves. As the teachers struggled with the *MindStorms* materials they became learners alongside their students.

As such, the relationships amongst students and teachers had a different nature. Children were in charge of their own learning. Many of the teachers commented that in this project, constructivist learning was possible, and they had seen it brought to life in their classrooms.

Teachers' creativity plays a central role in this project. Rather than prescribe activities to be carried out by the teachers, we have asked each teacher to contribute his or her own expertise and passions in designing activities for their classroom.

Inspired by both the enthusiasm of their students and the response of the community, the teachers have developed a great strength of belief in the work they are engaged in. They have been invited to give 'hands-on' workshops (e.g., Kilkenny Education Centre, Blackrock Education Centre, UCD, NUI Maynooth) present at conferences (e.g., Computer Education Society of Ireland 1999 and 2000; INTO Magnet schools conference; *EuroPrim,* Germany) and host visits from other interested teachers from home and abroad (e.g., Austria and Denmark). This has had the effect of reaffirming the validity of their work, increasing their confidence, and heightening their awareness of the use of technology in education.

Evidence of improved home/school links has begun to emerge which, we hope, will lead to the development of a more relevant and meaningful approach to learning, both in school and at home. For example, parents have been visiting the schools to see the children's work, and in some cases

have volunteered to help out during class and after school. The children also have renewed their interest in building with LEGO materials at home. The individual schools' 'Open Evenings' have generated unprecedented interest and attendance.

As the *Empowering Minds* project develops, teachers' talents and creativity will continue to be respected and encouraged. It is expected that there will be endless opportunities for wide-ranging cross-curricular integration, including the development of mathematical skills, problem solving abilities, and opportunities for Art, Music, Drama, writing, and poetry. When teachers incorporate these new technologies and a more constructivist way of learning into their classrooms, they are more able to connect their unique backgrounds with the curriculum and the interests of their students. It is planned that the project will grow as the first round of teachers act as mentors for the new teachers brought on board. Through working with teachers in this way we hope to foster a new way of thinking about the role of technology in our classrooms of tomorrow.

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Acknowledgements

Figure 4: Sharing the Learning Experience

Figure 5: Discussing the Finer Points of Norman Life!

Figure 6: Too Busy to go Home

The Role of ICT as a Support to Primary Learning

Paddy Carroll

Introduction

This project is about taking computers and using them in the subject curriculum of an 'ordinary' primary school. It involves using computers in various ways in support of learning throughout the school. Six rural schools in North Tipperary are involved in the project – Rearcross, Ballina, Boher, Ballinahinch and Portroe. Each school has its own SIP co-ordinator and Portroe N.S. acts as lead school. The basic ICT equipment in use is relatively modest — at the outset of the project each school received, from the NCTE, a multimedia PC, scanner, digital camera and printer. In addition, the lead school also received a laptop and data projector. Help and assistance to the project comes predominantly from two sources — Mary Immaculate College, Limerick and Mol an Óige, Nenagh — and in addition, we work closely with the IT advisor from Limerick Education Centre.

Project Aims

Our aims grew fairly naturally from the direction and purpose of the project. They can best be understood in the following terms:

* to develop the use of ICT as a motivating tool in teaching and as a learning medium for pupils across the project schools
* to integrate ICT into a whole-school learning support strategy for weaker students

In a basic sense, what we are doing is looking to find a natural fit for ICT activity in the day-to-day life of rural primary schools, and in particular, to do so in a way that gives all pupils meaningful access to ICT resources and experience.

Project Approach

The class teachers from the various schools work together in groups: Juniors/Seniors; First/Second; Third/Fourth; Fifth/Sixth and Learning Support/Resource. Teachers from each group agree a curriculum subject or topic and then work with their pupils for a month or so on this. Essentially, ICT is used at the level of the group and so the degree of use varies; but there has been a steady upward trend in the amount of usage evident over the life of the project. Each group meets monthly to evaluate the work carried out and to plan for the month ahead. The teachers have all participated in NCTE Phase 1 and Phase 2 courses. Many have also attended courses on Web Design and HyperStudio. One teacher in each school acts as the school's project co-ordinator which involves being guide, helper and motivator to other members of staff. Additionally, the named SIP co-ordinator visits each participating school to support the work of both pupils and teachers. Thirty-five teachers and five hundred and seventy-eight pupils are involved in the project.

Activities to Date

Activities to date cover a range of curriculum activities and areas. We have tried to utilise individual strengths from within the schools, the SIP groups themselves and our communities. Our activities — either completed or in train — include:

English:

Each group has carried out activities such as Story Start/Story End, Rotating Stories, Rotating Poems, News Items, Book Reviews, Book of Jokes and Key-Pal emails. These activities involved much creative writing, spell and grammar checking. In some classes they took the place of formal essay writing. Many of these activities were carried out via email e.g., one school starts a story and another finishes it.

History:

Groups at each site researched the history of their school. A booklet containing the histories was published and copies given to each school. The next stage was each school researched the history of their local area and made a PowerPoint presentation. All were put on a CD-ROM and distributed to each school. These form valuable records of the work the groups undertook, while the act of making the CDs also provided a learning experience for those involved.

Geography:

Older groups at each of the SIP sites completed project work on 'Countries of the World'. This was prepared and presented using *HyperStudio*. The outcomes were burned onto a CD-ROM which was then made available to others with an interest in the topic. The quality of this work impressed everyone involved and offered much food for thought about future work in a similar vein.

Email/Internet:

Each school set up key-pals with a partner school and kept in regular touch throughout the year. This in itself led to some interesting and exciting work. In addition, the senior groups took particular topics such as 'Christmas around the World', 'Famous People', 'The Seven Wonders of the World', and so on and used email and the Internet more generally to research these. A set of magazines was made on the findings and these were distributed through each partner school.

Software Evaluation:

The project arranged for all our resource and learning support teachers and junior class teachers to attend a workshop on software packages and software evaluation. Participants then picked a package to use with their pupils. The experience of using these packages — perceptions of strengths, weaknesses etc. — were then written up as part of a formal evaluation of the packages. These evaluations became a valuable resource for all concerned and are being used by the project schools in deciding on investment in software to match needs in this area.

Impact on Teaching and Learning

The project has impacted on what we do in a number of ways — not all of them expected, but the vast majority of them positive.

The self-esteem of our pupils has benefited greatly from involvement in SIP. Pupils took pride in seeing their work in book format. All the booklets and CD-ROMs they produced are now used across the project schools as reading material. Pupils read for others and for themselves from materials that have an edge and relevance to our locality and district that is not readily found in

more commercial productions. This has given them a great sense of, not only reading, but also writing and publishing for a wider audience.

Collaboration with pupils in other rural schools in curriculum subjects took place. Hitherto they only met each other on a hurling field. This has had a positive effect on inter-school relations and has in some cases given the older children the opportunity to meet and work with others they may later have as classmates in second-level school.

Everyone involved has learned new information and communication technology skills. Even the pupils in the junior groups had the opportunity through SIP to make good use of the schools' computers. The chance to use and learn through specific software applications, and to use digital cameras, scanners, email and the Internet have all helped to make our pupils more computer literate. The beauty of it all is that the learning took place through a curriculum focus; ICT skills were inserted as and when necessary.

From the teachers' and schools' perspective, there was also a considerable amount gained from SIP participation. It has allowed teachers and pupils from the participating schools to share ideas, talents and skills. Most importantly perhaps, the project has also given us a formal structure for discussing ICT issues in relation to the curriculum. We attended computer courses to update our ICT skills where we might otherwise not have had the opportunity to do so, and then made the best use we could of those skills within the framework of SIP.

There have of course been downsides also. We have noticed that the more work we do with ICT in classroom, the more hardware is needed. Moreover, the time involved in planning and preparing for ICT use has a significant impact on classroom life — in an already overloaded curriculum. Throughout the project many computer breakdowns occurred — despite the newness of the equipment. This convinced us of the need for good technical support and backup for schools facing into ICT work on the scale we have done. As one of our teachers put it "SIP gave us lots of money but at a price!" – meaning more work for us all, and the realisation that schools alone cannot carry the technical burden of ICT innovation.

Release to support the project also caused some unexpected difficulties. The Project Co-ordinator is based in the lead school and is released for forty-five days each year of the project. This was essential to the overall success of the project. But getting a trained substitute teacher for the co-ordinator's class proved more difficult than we had envisaged; a sign perhaps that the 'project' approach may need to be reconsidered if any long-term initiatives are being considered?

Overall, however, SIP has created great interest throughout the project schools in using ICT as a support to learning and teaching. We have also benefited from our involvement in ways that we did not even consider.

The Rest of SIP and Beyond

The project team plans to continue doing more of the same and doing it even better, as everyone's ICT skills improves. In the short term, many of the teachers involved in the project are interested in doing a course on desktop and web publishing — to develop further the skills learned to date in this area. A Web site on the project will be also created over the next few months and at this point, we are also putting in place an action research type evaluation of our work.

Beyond the project we feel that similar inter-school activities could very usefully be run on a smaller scale. Such activities need teacher dedication and ICT skills and would need to be guided by a carefully discussed and agreed yearly plan. On reflection, we would also feel that the pacing of these activities would benefit greatly from moving at a slower pace than the present project. We have come a long way quickly, but this has had its price.

After seeing such great work, the project team would have no hesitation in saying that that ICT can definitely be used to good effect as a support to learning and teaching across the primary years. SIP has

given our pupils an audience for their work and has proved a great means of motivation for our weaker pupils. It has also given us, as teachers, a valuable framework to build future practice around.

Startech — Learning Together:
Video-conferencing in Geographically Remote Areas

Michael Crowley

Introduction

Our project, *Startech* — Learning Together (SIP 043) is concerned primarily with exploring the possibilities offered by video-conferencing to the work of primary schools in what are often termed geographically remote areas. It is fundamentally an action research project with the emphasis firmly on the process involved, not the end product.

This project is centred geographically in the West Cork area and involves a cluster of schools that have formed a network — the West Cork Information Technology Network (ITN) — in order to reduce isolation and elicit, where possible, a grassroots response to educational change.

Video-conferencing has offered these schools a unique window of opportunity and the project has been a huge motivational stimulus to both staff and pupils in the participating schools. Participant schools cover a wide spectrum in terms of size, location and socio-economic background. (A full list of the project schools is included as Appendix 1.)

Background

The original idea for SIP 043 came from the activities of the West Cork ITN who used video-conferencing as a resource during a series of summer in-service courses held in Bantry during 1998 and 1999, and, found it to be both inspiring and challenging. As a consequence of this exposure to the medium, network members discussed at monthly meetings the possibility of using video-conferencing in classroom situations and were delighted by the opportunity offered by *Schools IT 2000,* and, in particular, the Schools Integration Project (SIP) element of this Department of Education and Science (DES) initiative.

Immediately following the launch of *Schools IT 2000* the West Cork ITN officers, with the assistance of the local District Inspector, Fionbarr Ó Tuama, set about formulating a proposal that would give member schools the opportunity to explore the benefits of video-conferencing in the classrooms of West Cork. An application was lodged detailing the basic requirements and resources necessary to make the project feasible. This costing was expensive, but to our delight the initial response from the National Centre for Technology in Education (NCTE) was both positive and supportive.

With added input from SIP's National Co-ordinator, Séamus Knox, our project was refined and accepted. *Eircom* came in at this point as the project's major sponsor.

Once we had the go-ahead we set about putting in place local arrangements that would facilitate the work being proposed. This included the appointment from our existing membership of a SIP Project Co-ordinator who would manage the day-to-day running of the initiative. Donie Keane of Newcestown N.S. was seconded for a 1-year period (now extended to 2 years) to manage SIP 043 and a sister project in West Cork on Special Needs — the SPEAK project, based in Castletownbere.

Therefore, it may be said that SIP 043 has come about due to the initiative of the teachers in West Cork; has been facilitated by the Department of Education and Science in the person of Fionnbarr Ó Tuama; by the NCTE. in the person of Séamus Knox; and by *Eircom,* who chose to sponsor this project because broadband technology and its wider application was of obvious interest to them.

Project Milestones

SIP 043 has been an adventure from the beginning and many milestone achievements have marked our route.

The major developments have included appointing a co-ordinator; setting up the steering committee; sourcing and purchasing equipment; teacher training; the official project launch; first video-conferences between schools; literacy projects with Cork County Library and publishing a Web page. The initial tasks involved setting up a steering committee to guide the work on the ground and to assist the co-ordinator in sourcing and funding the necessary equipment. This committee came to include the following people who represented all the major partners contributing to SIP 043:

- Dónal Keane, Newcestown N.S. (Co-ordinator)
- Fionbarr Ó Tuama, Department of Education and Science
- Seamus Knox, NCTE
- Cormac O'Sullivan, *Eircom*
- Hilda Hegarty, Skibbereen Convent N.S.
- Dr. Colin McCormac, UCC (Project Evaluation)
- Michael Crowley, Coppeen N.S. (Project Leader)

The steering committee met initially once a month in UCC while the project was getting underway and less often as the infrastructure began to develop. Dr. McCormac's intended role was to advise on project evaluation models to be developed subsequently by the NCTE. However, at the time of writing, neither he nor Cormac O'Sullivan of *Eircom* are any longer part of this group. NCTE's evaluation model for SIP is not yet finalised — making evaluation difficult to address constructively at this point. Cormac O'Sullivan's role within Eircom has changed and he is no longer manager of the school's Information Age Project, though his role in SIP 043 has been immense and his collegiality, a defining feature.

A number of technical solutions were considered before the project equipment was finally purchased from Alcatel. The equipment consisted of 3 portable *Swiftsite II* units developed by Picturetel which have since proved very suitable in terms of quality, portability and usability. Other peripheral pieces of hardware included a digital camera, a video camera, a series of 29" TVs (to act as screens) and a document camera. This work was done in the main by Dónal Keane and completed to coincide with the installation of ISDN lines in all the project schools.

These lines were installed by *Eircom* personnel in all schools included in SIP 043 and this work was completed in a reasonable timeframe. There were — inevitably perhaps, given the technical ambition of what we were attempting — some problems with cabling in areas which were remote in terms of Eircom's existing infrastructure. However, by February 2000 all the project schools were linked up and the equipment was up and running, allowing the initial video-conferences between schools to begin.

Early Days

These early days of our project implementation saw two major decisions played out and — happily — doing so with considerable success; our unwillingness to tie the project to any one specific subject

area or interest, and our decision to invest so heavily in the 'human resource' aspect of our project.

All of our early efforts were experimental and avoided being directly subject-focused. This was to allow teachers across the project schools to become familiar, in a somewhat less restricted way, with the technology and its usage. However, there were some early problems relating to lack of familiarity with the equipment and reluctance on behalf of some teachers to appear before the camera. In contrast, the children in the project schools loved the technology from the start, and prepared work with enthusiasm for a range of interactions covering a broad cross-section of curricular areas. This enthusiasm has been the most surprising feature of SIP 043 for many of us. The good-humoured adaptability of these children has been a major factor in successfully 'driving' this project.

Early reticence quickly faded however and another important aspect of this project emerged; it was the way in which the technology gradually became less and less an issue when the schools interacted. After only a short while the focus moved from the technology to the work in hand and technology became simply a tool (albeit a hugely motivating influence) to use to achieve an objective. It became — in the language of ICT development — 'invisible'.

Once installed and mastered the equipment worked very successfully with excellent quality of picture and sound at different specifications i.e., 128k and 356k capabilities.

Investing heavily in the 'human resource' aspect of our project paid off in terms of teacher training and frontline technical support. Pre-project teacher training was not a huge issue with this SIP despite its intensely technical nature as Donie Keane became expert in the start-up aspects of the conferencing and was available to all schools when required. However, formal training as required was facilitated by Mary O' Leary, ICT Advisor at the Cork Teachers' Centre. This included a training seminar at the headquarters of the Western Education and Library Board in Omagh, which was facilitated by their International Officer, Marie Martin. This training proved popular and useful, and the trip and seminar were a great success, leading to subsequent interactions of an international nature between project schools and schools in Northern Ireland.

Launching

The official launch of *Startech* — Learning Together was a high profile event at which a great spirit of partnership between schools, other education interests, project communities, and the corporate sector was in evidence. The project was officially launched in Baltimore by Minister Micheál Martin, assisted by Minister Joe Walsh. Events on the day included a live video-conference with Omagh as well as a link to the local school organised by Michael J. Collins — the School Principal who hosted the event. (See Appendix 2 for a full list of speakers at the launch.)

Project Activities

Following the launch, the project groups began to link and interact very actively and the following areas of the curriculum were exposed:

- literacy (reading for pleasure)
- Science
- learning support classes by distance learning
- Music
- problem solving in Maths
- visual arts (pottery)

Of these, the most successful were the literacy and the distance learning projects. Each had a major impact on learning and teaching across the schools.

The literacy project proved a huge success due to the generous sponsorship of Cork County Library which provided a range of books for children to read. These were based on the *Bisto* Awards and schools were provided with copies of the short-listed books with a view to compiling a list of the favourite titles and matching this with the view of the experts. These books provided an invaluable aid to video-conferencing and children had great fun discussing books and characters as well as devising quiz activities and creating art based on them. The teachers involved felt strongly that a noticeable increase in reading ages and attitudes to reading was a direct result of this activity. The first run was not systematically evaluated, unfortunately. But the project is being repeated at present and evaluated quantitatively to gather empirical data in support of the teachers' views.

The distance learning aspect of the project involved a teacher from the mainland at Baltimore N.S. providing learning support by video-conference to a pupil on Oileán Chléire. This was a one-to-one interaction which proved hugely successful and was a direct contrast to the group interaction of the literacy activities. All activities were varied and included musical contributions, poems and other assorted exchanges in order to ensure maximum interest. Evaluation is once again a difficulty here — but there was clear evidence of learning gain associated with the activity and teachers on both sides of the conference were pleased with its outcomes.

Project Impact

The impact on teaching and learning of SIP 043 has been considerable. Overall it may be claimed that video-conferencing proved a huge stimulus to teachers and to pupils and led to co-operative learning of a type never before experienced by many of the isolated schools in the West Cork area. Teachers have operated in a context never before experienced and used a medium of interaction that one would not heretofore have associated with primary schools in this country. Individual teachers have gained immensely in terms of experience, self-esteem and collegiality. Moreover, a network of contacts has been created alongside a growing body of expertise. A model of good practice has been created and further challenges appear less difficult. Vastly increased inter-schools co-operation has been a significant result of this experiment and pupil-teacher and teacher-parent relations have been greatly enhanced.

At its simplest, we have succeeded in finding a focus for using ICT so that it is no longer about equipment for which some use must be found. We have used technology as a tool to motivate and 'network' pupils and teachers and it has given children reasons — and a new means — to learn, which appeals irresistibly to them.

Towards the end of the year a Web page was published by the West Cork ITN detailing, in much more depth, the activities and the structure of SIP 043. It may be viewed at http//:homepage.eircom.net/~SIP43.

Future Challenges

Full and proper review of our work to date is also a challenge to be addressed. At present, a research student is involved in action research on the project's impact across the network schools. We expect this to offer some headings for future work.

However, our principal future challenges involve maintaining the momentum of SIP 043 and securing funding beyond the lifetime of current SIP. The SIP has gone well to date and the process has evolved into a meaningful range of inter-school activities which support the revised curriculum for primary schools. A major challenge will be to cope without a full-time co-ordinator but this may be achieved by careful planning and — rather sadly — by reduced contact among the schools. In the future it is envisaged that two-way partnerships between pairs of schools (rather than the whole

network) will be the norm and that equipment will be available on a rota basis. At this point we feel that it is unlikely that the number of participating schools can be increased — though equipment could possibly be borrowed for once-off activities involving schools, outside the ITN network, with an ISDN facility.

On reflection, we would suggest that the type of activity undertaken as part of *Startech* — Learning Together (Sip 043) is replicable anywhere — given the necessary technical infrastructure and sufficient teacher-time and expertise. The journey towards ICT integration into the primary curriculum is not an easy one, but so far, it has been exciting and worthwhile for us. West Cork ITN schools are more than willing to provide advice and to co-operate with any group embarking on a similar project.

Appendices

Appendix 1:

Project Schools, West Cork ITN, SIP 043.

School	E-Mail	Staff	Status
Coppeen	Coppeen.ias@eircom.net	3	Rural/Co-ed
Newcestown	Newcestown@eircom.net	7	Rural/Co-ed
Dunmanway Convent	smgssd@iol.ie	6	Town/Single-sex
Skibbereen Convent	stjosskibb.ias@eircom.net	8	Town/Single-sex
Kealkil N.S.	kealkill@iol.ie	3	Rural/Co-ed
Oilean Chléire	snshleire.ias@eircom.net	2	Island
Gaelscoil Bheanntraí	gsbeannt@iol.ie	7	Gaelscoil
Glengarriffe N.S.	fiachra@iol.ie	3	Village/Co-ed
Leap N.S.	leapns.ias@eircom.net	4	Village/Co-ed
Durrus N.S.	stjamesdurrus.ias@eircom.net	2	Rural/Church of Ireland
Schull N.S.	schullns.ias@eircom.net	7	Village/Co-ed
Kilcrohane N.S.	kilns.ias@eircom.net	2	Village/Co-ed
Cappabue N.S.	cappabue.ias@eircom.net	2	Rural/Co-ed
Rath N.S.	rathns.ias@eircom.net	4	Village/Co-ed
Castletownbere N.S.	paul@stevens.net	10	Town/Co-ed

Appendix 2:

Speakers at the Official Launch of the Project

Professor Kieran Byrne, University of Limerick; Michael Crowley, SIP 043; Séamus Knox, NCTE;

Marie Martin, WELB (by video link); Micheál Martin, Minister for Education and Science;

Cormac O'Sullivan, *Eircom*; Fionbarr Ó Tuama, Department of Education and Science;

Paul Stevens, SPEAK Project; Joe Walsh, Minister for Food and Science.

TIM (Technology in Music): Integrating Technology into Music Education

Catherine Frost

Introduction

TIM — Technology in Music (SIP 033) is, as could be imagined from the title, to do with the integration of technology into the teaching of music in both primary and secondary schools. The main thrust of the project is to investigate the use of ICT (primarily MIDI interface and cross-platform software) in the teaching of music.

The objectives of our project are:

- to introduce teachers and pupils to the potential of MIDI interface in teaching and learning music
- to train teachers in basic computing and in the use of cross-platform software in the music curriculum
- to develop models of good practice in using ICT to teach music
- to get feedback from participants on their experiences with the technology

In brief: there are 5 schools involved — all of whom have a very good IT and/or Music history. (See Appendix for a full listing.) Across the schools, there are nine teachers directly involved in the project — seven music teachers in the respective secondary schools and two primary school teachers, one of whom teaches 6th class in the school and the other who co-ordinates IT. Some of the Music teachers had dabbled a little in music technology, attended music technology courses run by the Department of Education and Science (DES) and the Post-Primary Music Teachers Association and had participated in low-level computer courses e.g., NCTE Phase 1 and 2 courses. Two of the schools are mixed (Coláiste/Gaelcholáiste Choilm and Glanmire Community College). The other three schools are all-girls' schools. Therefore, the targeted age groups are from 10 to 17 years and predominantly female. Not all schools are targeting the same classes but overall, all year groups are being exposed to the technology. The sponsors of the project are NCTE, *Apple* Computers Sales and Corel Corporation.

The Challenge

The challenge of bringing technology usefully to bear on the teaching and learning of Music in our schools is a formidable one. We felt very inadequate in the beginning and in many ways still do. But from the outset, we had a sense that there were exciting times ahead. Everyone recognised that there would no doubt also be some frustrations and that time and patience were of the essence. We agreed that what lay ahead was going to be (and indeed still is!) a huge learning curve for all of us. Some worried about coming to grips with the computers (iMacs in this case) — most of the project teachers were more familiar with PCs. Others worried about coming to grips with the software program — Steinberg's *Cubase Score VST* (a virtual recording studio).

The secondary schools involved in the project are, in the main, investigating and being trained in on, the use of *Cubase* as appropriate software in the teaching and learning of Music. *Cubase* is a

sequencing and notation program. Time allowing, they hope also to investigate and evaluate Sibelius (a notation program). The primary school had a sense that *Cubase* might prove too complex for the primary school student and therefore decided to examine other software — *Music Ace* and *Cubasis* (lighter version of *Cubase*) in particular.

Expectations

We have high expectations of our involvement in SIP. These include:

- a heightened awareness among students and teachers of the use of technology in the learning and teaching of Music
- that the teaching and learning of music should take on an even more practical slant in project schools
- more students to use the technology option in performance at Junior and Leaving Certificate
- the teachers involved to become more *au fait* with the cutting edge of what is happening in the music business
- the teachers involved to become more familiar with computing in general — the sending of emails, the Internet, basic computing skills, Web design etc.
- to make a CD of our students' music making

Developments and Key Moments to Date

Launch of Project

The project was launched in October 1998 at *Apple* Computers, Cork by the then Minister for Education, Mícheál Martin and the Taoiseach, Bertie Ahern. Also involved were Jerome Leonard (Inspector of Music, DES); Mary O'Leary (IT Advisor, Cork) — who has been of invaluable assistance; students and teachers from the schools directly involved in the project; as well as other interested musicians; and music teachers from secondary schools and third level colleges. There was a musical presentation which included a demonstration of the software (*Cubase*) used in conjunction with live music from the students of Coláiste Choilm. The excitement and anticipation of students and teachers alike was palpable.

Installation and Purchase

We were then like children awaiting Christmas — both students and teachers alike. Finally, we each got delivery of 20 iMacs and the schools purchased 10 Yamaha keyboards, earphones, a microphone and sound mixer. Then came the installation of *Cubase*, which took some time, as we were all completely new to the process and, in particular, to the operating system of the iMac.

Many of these early difficulties were resolved once we had established that the software required a surprisingly large amount of memory. When extra memory was acquired as well as more technical assistance the whole operation began to run much more smoothly. We were ready to teach our classes or rather to experiment with our classes. We were and still are being trained ourselves!

Training

As mentioned earlier, several of the teachers involved had had a certain amount of training in basic ICT as a part of the *Schools IT 2000* initiative and secondary project teachers had attended music technology courses run by PPMTA (Post Primary Music Teachers Association). Now we began to organise our own training in the use of *Cubase*. Initially, we had some instruction in the workings of *Cubasis* (the lighter version of Cubase) while we awaited installation of *Cubase* itself. Once *Cubase*

was installed, the teachers felt a need to be instructed on the notation feature of the program (essential in music class at secondary level for work with Junior and Leaving Certificate students) as well as its MIDI and Audio recording features. We were delighted to find an instructor who is very familiar with the Irish school system and therefore very suited to our needs. Our most productive session at this point was August 2000 where the project teachers spent a week together training and ,with great excitement, produced a little CD.

The Teachers' CD

Cubase is a virtual recording studio. It enables the musician to play in tracks via MIDI (Musical Instrument Digital Interface) using a keyboard and also to record (using microphones and mixer) vocals and acoustic instruments. All the teachers on the course could play a variety of instruments i.e., double bass, piano, violin, concertina, guitar and of course, we could all sing. Therefore, we decided to record the Beatles' song 'Let it be'. We had great fun and could see the huge potential for classroom development. We were involved in every aspect, from the actual playing in of tracks to the recording and mixing, burning and labelling of the CD!

Collaborative Christmas CD

Such was the enthusiasm generated by our success with the initial CD that we decided there and then, to do a Christmas CD. All five schools would come together at Christmas and record carols — all would sing and record together at one venue (Coláiste Choilm as it could comfortably seat a few hundred students). This would serve to further disseminate our project to a much wider audience. More students would be actively involved and parents and teachers would get to hear about it. This remains one of the highpoints of the project to date.

Collaborative Teaching and Learning and LCA Initiative

We like the collaborative aspect of the whole initiative — the collaboration within a staff and indeed between schools. Teachers can share ideas. Teaching within a particular subject area can be quite isolated and this whole ICT initiative allows other teachers to meet more often and share ideas. Of course, with the help of technology, they need not actually meet to share ideas, successes and indeed frustrations.

An interesting development here was collaboration between secondary and primary schools. The music teacher and students from Glanmire Community College went to visit the pupils of North Presentation Primary school and taught them how to input a simple tune and drum track. After some initial shyness, this session went very well. The Primary school had feared that the program might be too complicated for their pupils, but it was discovered that it could, in fact, be used in a very basic way and was quite successful. They are also evaluating other music software that might be more suitable for their requirements.

The LCA students from Presentation Secondary, Bandon invited the local Primary schools' students to their school, taught them a song and then recorded it. They hope to cut a CD. This was done as part of an LCA module and also proved to be very successful.

Young Scientists' Projects

Two *Young Scientist* projects have been inspired by TIM (SIP33). Three students from Coláiste/Gaelcholáiste Choilm undertook a project in *Young Scientist and Technology Exhibition* 2000. Their project, which was called 'From Ear to Paper', examined music notation and investigated different computer software programs which can be used to notate music. Because of their interest in Irish traditional music, they decided that this type of music would be perfect for investigating the accuracy of computerised notation. The software programs available to them at the time were *Digital Performer 2.41, Finale,* and e-magic's *MicroLogic AV3.71*. They concluded that *MicroLogicAV3.71* is generally the most suitable computer program for notating Irish traditional

music and were very pleased to win a Technology Prize. They exhibited their project on an iMac and keyboard from school. They hope to do a similar investigation on *Cubase* and *Sibelius* for the purposes of this project.

The other *Young Scientist* project for the 2001 exhibition examines the sending of audio and midi recording as an email message. Two students from Coláiste/Gaelcholáiste Choilm and one student from Glanmire Community College undertook this project.

It is now planned to build on these students' newly-found expertise to communicate music across the project schools, and beyond. This is likely to result in a collaborative CD involving individuals and/or groups from a number of project schools. The idea is simple enough: a 'start out' track is laid down and then sent to another school, the students there add another track, then it is sent on again and so it grows. . . It can then be mixed in one school and sent for approval to the others. Interestingly, these two projects were inspired by the fact that the technology was available in the schools.

Email and Use of the Internet

There is a much wider use made in the project schools of email and use of the Internet than heretofore. The new vocabulary we now use never ceases to amaze our colleagues (who are also taking a great interest), considering the little we knew at the inception of the project. The students have begun to download backing tracks for their performance in Slógadh competitions.

The iMac Music Technology rooms at Christ King Secondary School and Coláiste Choilm are now on-line and the other schools hope to have connectivity (more new vocab.!) in the very near future.

Ceoltech

Presentation School, Bandon provide what they call "Ceoltech". On Wednesday afternoons they provide open access for all interested students to the music technology. These students include those who may not be in a class that has access to the technology and those who wish to practise for exam purposes or otherwise. All the project schools now provide this access where feasible. The Bandon school itself came up with the novel title!

Experimentation of Primary School with other Music Software

As mentioned above, North Presentation Primary School are also investigating the feasibility of other music software in the teaching of Music e.g., *MusicAce* and *Explorer* etc. These evaluations will also be included in our final report.

Technology in Performance Options for Examination

We believe that developing the use of technology in the performance option for Junior and Leaving Certificate examinations is an essential part of the project. Students in our classes now have the facility to actually use music technology in their examinations. This opens the way for a class-based musical option previously unavailable to students in the project schools. Many of our students are now hoping to take the technology option as part of performance at both Leaving Certificate and Junior Certificate level. The latter will we think be a first, and we await with interest the outcome.

Technology in the Teaching of Examination Programmes

Of course the new arrangements also have profound possibilities for how we go about teaching Music in preparation for state examinations. Essentially, the knowledge our students have gained during the implementation of this project has considerable implication for the way we teach Music in the future and how our students learn. This would include everything from the practicalities of learning to play a tune on the music keyboard — essential if one wants to record something – to

the learning and inputting of chords and harmonies. The possibilities are in fact endless. We have, we believe, only begun to understand the possibilities involved.

Impact on Teaching and Learning

The preceding section gives some sense of the scale and impact that our project is having on the teaching and learning of music in the SIP schools. What we are doing can be seen as fundamentally reinventing our practice, an exercise which is both difficult and rewarding in curriculum terms.

To have a whole class busily working with earphones on — happily practising their melodies, chords and experimentation — is very satisfying for us as teachers. Ten keyboards are shared by twice that number of students through the use of 'splitters' on the earphones. This facilitates two students wearing earphones at the one keyboard. The pianist can input while their partner works the computer. It also allows the teacher to hear students individually while the others in the class continue with their work. In the same way, more advanced students can help the less advanced. Essentially, the technology allows the class to work as teams or as individuals or in combination with a teacher, as required.

At this point, students in classes right across the project schools can (a) input a tune and edit the score, (b) input tracks from keyboard — drum track, chords, tune, harmony etc., (c) create score without music keyboard (choosing the correct amount of bars and putting on the stave: correct note values, slurs, hide stems etc.,) (d) create professional looking, exam-quality output — including providing notes of song with lyrics under the correct notes, and so on.

One unexpected, but pleasing, outcome of the project has been the way in which having the appropriate ICT facilities provides Transition Year classes with a superb opportunity to use and learn through the technology — they have the freedom of time to spend on it. Students in these groups are, we believe, acquiring a proficiency which can be built to great effect for Leaving Certificate and, we would hope, well beyond.

Another bonus must be the noticeable increase in home computer activity among the teachers. TIM has ushered us into a new world of connectivity and technology!

And of course, there has been a knock-on effect simply from having an increased level of technology in the schools. For example, Transition Year students are learning desktop publishing and a local newspaper 'Ballincollig Today' is being produced at Coláiste Choilm. Christ King students are involved in the quite sophisticated use of Maths programs on their computers. Technology-supported activity has become a feature of school Open Days. Other ICT initiatives — such as the Young Scientist entries mentioned earlier — have started to occur and, we hope, will continue to grow in variety and quality.

Remaining Challenges

The main challenge now is to ensure the continuation of all this work.

TIM is certainly not a project without its frustrations. In the main these prove minor but from time to time, the technology aspect can cause worries. At the moment we are in the throes of trying to resolve the recurring problem of MIDI disappearing from the machines. This one has us all baffled. In most cases we, the teachers and students, can 'fix' problems as they occur but it slows up the work too much for our liking. Hopefully over time such issues will concern us less.

It was with great excitement and anticipation that we began the *TIM* project. Waiting for everything to materialise was very difficult at the start. We had a long wait before all the equipment was installed in the project schools. It fact at times it felt like a dream! Was all this equipment really

going to be ours to experiment with and learn through? Now that it is set up and integrated so fully into the work we do, it has opened up a whole new world to us — teachers and students alike. We intend making a further CD before the end of the school year — this time perhaps featuring songs from the shows which all of the secondary schools have produced this year. We look forward to the inclusion of music technology in the Junior Certificate and to the progress of those students taking it as part performing option in this year's Leaving Certificate. The impossible now looks far more possible to us!

A final note: from the outset, we worked towards making the *TIM* project self-sustaining. We envisaged that our SIP would be ongoing and that we — the teachers — would continue our training, work on new and engaging ways of teaching and learning through music technology and ICT, and keep up to speed with developments in this area. It is our hope that the world of music technology will continue to enhance and further the teaching of Music in our schools. Increasingly it is our belief that it will.

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- Mary O'Leary (IT Advisor, Cork)
- Ian Callanan
- Jerome Leonard (Music Inspector)
- Sinéad Luttrell
- Séamus Knox, NCTE

Appendix

Participating Schools

- Coláiste/Gaelcholáiste Choilm, Ballincollig, Co. Cork
- Glanmire Community College, Cork
- Christ King Secondary School, Cork
- Presentation Convent, Bandon, Co. Cork
- North Presentation Primary School, Gerald Griffin Street, Cork

The Field Fences of Sligo:
An ICT-supported Heritage Project

John Joe Gallagher

Introduction

In September 1999 the Education Committee of the Heritage Council of Ireland decided to sponsor a heritage project for primary and post-primary schools which was to be based on a study of local field fences. The project was planned to run in counties Sligo, Galway, and Kerry. The intention was to examine local areas under four headings: architecture, archaeology, flora and fauna, and folklore and it was hoped that the finished project would give a 'snapshot' of each county in 2000.

The idea for *The Field Fences of Sligo* project (SIP 061) first came about when Siobhán Ryan, Heritage Officer with Sligo County Council approached me in late September of that year to supply information on schools in the county. She planned to run the project in selected primary and post primary schools. Having heard a description of the project, I felt that using ICT would greatly enhance the work as it progressed, and allow the end product to be seen by a much wider audience. I suggested that we might apply for inclusion in the newly announced Schools Integration Project (SIP). Following preliminary discussions with Séamus Knox, (National Co-ordinator SIP) and a successful application for inclusion in SIP, our project was approved in Autumn 1999.

Eight primary schools were selected as project schools — each representing different landscapes in the county. The primary schools were all small rural schools: five of the schools were two-teacher schools, one was a three-teacher and two were four-teacher schools. A total of 174 students were involved and the great majority of them were in 5th and 6th classes — the top end of the primary system. A second-level college in Sligo town was selected as the project hub for publishing and collating materials. This decision brought a total of 35 enthusiastic and capable Transition Year students aged 14 to 16 in on the project. (See Appendix for a full listing of the schools involved.)

Project Aims

The aims of the project were drawn up and agreed by all participants. These were:
- to stimulate an interest and awareness in students of their heritage
- to make students aware of the many elements that make up the heritage of a locality
- to engage the pupils in cross-curricular initiatives that would develop an awareness of their own locality
- to develop the skills of teachers in using multimedia tools
- to provide students with access to ICT tools such as scanners, digital cameras and camcorders
- to provide students with the opportunity to explore new software packages to produce multimedia presentations
- to use email as a communications tool
- to use a digital camera, camcorder and scanner as research and presentation resources

- to use *HyperStudio* as the primary resource to prepare and present a multimedia presentation on their own locality
- to disseminate the findings of the project to a broad audience through the publication of a poster insert in a local newspaper
- to provide each participating school with resource material for posting to their school Web site

Project Partners

From the outset, the project attracted a set of dynamic individual and corporate supporters. Sligo County Council, Sligo Corporation, Sligo *Leader* Partnership Company, The Heritage Council and the NCTE were on board as partners. Leader supported the project through a schools' art programme and this element proved very worthwhile. County Sligo VEC was approached to provide additional art support to the eight primary schools which resulted in an additional five hours per schools being added to the fifteen already being sponsored by *Leader*. The Sligo Champion newspaper agreed to part-sponsor the printing of our posters and Sligo Education Centre also came on board as a sponsor by providing the project with copying, printing and book binding facilities. Further support was provided through the INTO Heritage in Schools project and Sligo County Library gave copies of the 1938 Folklore Commission study to the schools. Many of the schools used local experts who were invaluable in leading field trips and guiding teachers and students through different stages of the project.

Project Outcomes

This was always intended to be a high-activity, hands-on project that used ICT to support curriculum work rather than determine it. From the very beginning it was envisaged that the primary students would be involved in field work to familiarise themselves with the landscape of their own locality. Under the projects four themes, the children would record their findings in text, drawings and photographs. The second-level students would then collate the material from the primary schools to produce a poster collage — using text, pictures and artwork. We also intended that each school would produce a *HyperStudio* presentation of their work and that a simple Web site would be built to reflect the activities of the project.

In fact, although we are still far from finished our work, the project has already generated many more outcomes than originally planned. The principal outcomes of the project so far include a printed booklet entitled 'Exploring the Field Fences of County Sligo' (which is much in demand across the county), a Web site at www.sligofieldfences.com, and an attractive A1 size colour poster for distribution across all Sligo schools and beyond. In addition, all of the schools produced their own booklets and *HyperStudio* presentations as well as a vast amount of art work.

What has been Done so Far

Before the project launched officially, we invited the teachers in the participating schools to a number of meetings. As co-ordinators of the project, Siobhán Ryan, the Heritage Officer of Sligo County Council and I, John Joe Gallagher, as ICT Advisor for Sligo had already come together on four or five occasions to clear the ground and put in place the broad parameters of the project. It was agreed that each primary school would first of all select a 1km square of land which would be the focus of each school's study. Ideally the square would encompass the school and its surroundings or be close enough to the school to facilitate frequent field visits by the pupils. Originally we had thought that the project would run from January until June 2000. However, we soon realised that we would be unlikely to meet the June deadline and so we set late October as

the date for the project launch. This proved a wise decision as the revised deadline was actually met and the great bulk of the work completed on time.

Project Themes or Modules

The square selected would then be studied under our four agreed headings: architecture, archaeology, flora and fauna, and folklore. The schools agreed on a period of four weeks to work on each of the four themes. Large A3 folders were provided for each of the schools. As the children completed work on each topic, the material compiled as a result of field trips, local research or gathered from interviewing people in the community, was inserted into the folders. The range of this material was impressive. It included numerous hand-written and printed accounts of field observations and findings, as well as drawings, photographs and scanned images. These folders were then sent to the Ursuline College where the team of Transition Year students selected material from each school for inclusion in the project booklet and poster. Initially, this involved a work-intensive process of selecting what was broadly agreed to be the most suitable material and then using word processors to type up all the hand-written material: images and photographs were scanned. However, for the second and later themes the primary schools were in a position to send in processed copy on floppy disks holding digital photographs, scanned images and text files. This greatly reduced the workload for the Transition Year class and also added greatly to the sense of ownership experienced by the children in the primary schools.

Project Booklets and Poster

Work on the project booklets and poster took place in two phases:

In the first phase, each primary school collected a vast amount of material on each of the four modules or themes. Each of the schools had 20 hours support from an artist and a great variety of work was generated through this. Materials from the primary schools included drawings, paintings and art panels or art strips for insertion along the bottom of each page. These panels were designed to illustrate a particular aspect of the work.

The original intention was to produce a booklet on the field fences at each location closely modelled on an agreed project publication template. This template was for a quarto size booklet in which four pages were allocated to each of the four themes or modules the children had investigated. However, while the template was to prove ideal in selecting the material for the overall booklet, it was found to be too restrictive in providing a basis for the schools' own publications. So much excellent material was assembled that it was felt that each primary school should publish their own booklet in a form best suited to the work they had to hand. The co-ordinators were fortunate that they could call on an artist who was also an art teacher to help with this challenge. She visited each school and, in consultation with the students, drew up their own individual template. As a result, seven of the eight schools produced a booklet on their project: Microsoft Word was used by six of them, while one school produced their booklet through Microsoft Publisher.

In June we moved into the second stage. An editorial team from the Transition Year students came together in Sligo Education Centre to select the material for the final, whole-project booklet. In fact, four separate teams were involved — each working with an adult leader on one or other of the modules or themes. This booklet was compiled by selecting materials from each of the eight earlier school booklets. An introduction to the booklet was written by the co-ordinators and the Transition Year editorial team and then the entire thing went to the printer. Finally, 5,000 copies arrived at the Sligo Education Centre on the 26th October 2000, the day the book was due to be launched.

The second whole-project outcome was in the form of an A2 poster. Initially, we had intended that the poster would be included as an insert in the local weekly newspaper, The Sligo Champion, but on reflection we decided to print 5,000 copies and deliver them directly to the participating schools as well as have copies distributed to schools countrywide. *Kidsown Publishing,* based in

Ballintogher, Co Sligo were contracted to do the design work on the poster with the Transition Year students — again using the material sent from the primary schools. Simon Spain and Victoria Ryle from Kidsown worked with the students on a number of occasions selecting material. While this design team made valuable input into the decision, for technical reasons it was Kidsown who settled on the final layout and 5,000 copies of the poster were printed.

It is our intention that a copy of the project booklet and poster will be sent to every primary school in the country.

Lessons Learnt!

Obviously the process was not without some weaknesses and moments of reservation but as a project team, we feel that we learnt much from these. For example, the decision to run initially with a largely prescriptive booklet template was taken in view of the timescale involved. It made a certain amount of sense to ask each school to consider possible similarities and dissimilarities in their immediate localities. So, for example, in the architecture module, the students were asked to provide images of specific features such as a gate, a stone wall, different types of fences and so on, with accompanying text. There could have been reservations about this level of structuring of the task, but in general it worked well and was justified, we feel, in terms of the quality of the end product and the decision making process that it facilitated. Having to work within a set specification proved to be a valuable learning activity in itself.

Also, our knowledge of the fine-detail of the traditional publishing process let us down in an unexpected way. When the material for the project booklet was sent to the printer, we discovered that the images had been scanned at a low resolution. This meant that the finished product would have been of poor quality. Low resolution was not so much an issue with the local publications but for our showpiece booklet, it was clearly unacceptable. As a result, we had to re-scan all the images as well as reformat the digital photographs as TIFFs. This would have meant an investment of time well beyond the reasonable for the children involved in the project. We decided therefore to do it ourselves. Both project co-ordinators, with the assistance of a teacher seconded from a project school, worked for a week to complete the work.

Web Presence

The project was also very fortunate to have Micheál Ó Broin as a participating teacher. Micheál is a skilled Webmaster and this provided an unexpected edge of professionalism to the Web element of our work. He put much of the material from the schools onto an impressive Web site at http://www.sligofieldfences.com. This has had a steady stream of visitors since it went live and it is planned that during the school year 2000/2001, the Transition Year class in the Ursuline will add all the material from the school booklets to this Web site, thus giving the work an audience that would otherwise be well beyond the resources of the project.

Multimedia Work

One of the original intended outcomes of the *Field Fences of Sligo* project was the presentation of material using *HyperStudio*. However, because the collection of materials and the printing of the school booklets had taken up so much time, we were only able consider doing some work on this in September 2000. With the showcase date set for only eight weeks later, this left a very short period in which to get a lot of multimedia work done. Additionally, training for teachers in *HyperStudio* had taken place back in January 2000 when the project started. By September, many had forgotten what they had learnt and a series of supplementary training nights needed to be laid on. Nevertheless, all primary schools involved in the project did some work with *HyperStudio*. Five schools even completed a full presentation of their project using the package. Their material was in the main the same as that already used in the booklet but with *HyperStudio* it was possible to add sound files which added an interesting extra dimension.

Unexpected Outcomes

There were an number of unexpected but exciting outcomes which resulted mainly from the art support programme and visits to the schools by members of the local community.

One school did *batik* work and as a result ended up with a beautiful framed collage of *batik* panels. Another school did creative dance as part of their art programme and they performed an interpretative piece on how the ice-age had formed the drumlin on which their school was built. This school also designed a tile panel for a wall in their playground. The panel is now in place and it will be a reminder for future generations of this SIP project. One school has since published a book of creative writing which came about as a result of their artist's support programme. This school also typed up the result of the 1937 Folklore Commission for their area. This made available to the local community — for the first time since its completion — an intriguing account of the daily lives, pastimes and experiences of children in the area sixty years ago. Traditional straw crafts were highlighted also by this school and children were shown how rod baskets and creels were made. The art of making straw masks as used by traditional Wren Boys was demonstrated for pupils in another school. Children from another project school went to witness an archaeological dig and had an opportunity to discuss with those involved how a dig was carried out. One school discovered three hitherto undetected ring forts after getting a copy of a satellite map of their area.

Showcasing the Project Work

The most significant public events of the project were the book launches that took place in each school during the second last week of October 2000. While each launch was very different, reflecting as it did that all schools are different, there were certain common elements. An extensive display of all the materials researched and all the art work done during the project, was mounted around the walls of the classrooms, assembly halls and corridors of the schools. These presentations were generally done under the heading of each theme or module studied. The *HyperStudio* presentation was then shown to crowded halls /classrooms of parents, students and members of the local communities. Copies of the school booklets were distributed and certificates were presented to all the participants. In several of the schools, the children themselves introduced the presentations and explained how they had completed the project. Refreshments were invariably served and it was obvious that the project had involved members of the local community who now showed great pride in the work produced by the students in their local school.

The circuit of local launches was then rounded off with a county-level launch of the overall project booklet which took place on Thursday 26th October in Sligo Education Centre. Hubert Kearns, Sligo County Manager and Séamus Knox, National Co-ordinator of SIP, were among those who attended. Each school furnished a display stand with a selection of their photographs, drawings and art work. Speakers from each of the nine participating schools outlined how the project was organised and introduced the work done in the nine schools. A compilation *HyperStudio* presentation, made up of selected materials from each of the eight schools, was shown and copies of the overall project booklet (literally hot from the presses!) were distributed to all present.

At this point, we are looking into cutting a CD with examples of the work done by the project schools in order to make this available to schools who were not involved in *The Field Fences of Sligo* project. This CD will include some (or all) of the schools' own publications and a sample of the *HyperStudio* presentations linked together to form a coherent unit. We also intend that the Web site will be developed to contain a substantial amount of all the work completed by the students as part of the project.

Project Impact

There is not much available by way of formal project evaluation at this moment. Time has been against us in this regard. However, a detailed evaluation template has recently been developed and circulated to all the schools involved. We think this is likely to provide interesting insights into the work of the Field Fence project and its impact on teaching and learning in project schools.

But even at this point there can be no doubting that the teachers and pupils involved were very enthusiastic about the experience. Their response to the demands placed on them by the project timescale and the work they produced speaks for itself. It may be too early to assess the overall impact of the project, but we can certainly say at this stage that it offered the schools involved a unique opportunity to collaborate in a meaningful, educationally valuable way. It also gave both pupils and teachers an opportunity to explore their own localities in ways that they would otherwise have been very unlikely to do. The 'visible' outcomes of the project are — as can be seen above — wide-ranging and diverse. The involvement of the local communities was another important feature of the project, as was the opportunity to have visiting artists and guest speakers. At the very least, the children have produced a valuable record of their own localities which can be added to in the future. But those of us involved have a strong feeling that the experience goes deeper than that: it has rooted these children in a vibrant and positive way in their local environments and communities. It has helped educate them in a very old-fashioned sense of that term; and has also shown some of the possibilities that ICT holds out when used within the framework of a heritage project such as ours.

Appendix

Schools involved in *The Field Fences of Sligo* Project (SIP 061)

- Banada N.S.
- Kilrusheighter N.S.
- Ballinlig N.S.
- Ballintogher N.S.
- Cliffoney N.S.
- Ballweelin N.S.
- Coolbock N.S.
- Rockfield N.S.
- Ursuline College, Sligo.

Cyberclass: The Use of ICT in Religious Education

Tom Gunning

Introduction

The *Schools IT 2000* initiative aimed to put in place the culture and infrastructure needed to successfully integrate ICT (Information and Communications Technology) into our education system. An important aspect of this is to understand better how commercially produced teaching and learning packages might be integrated into existing practice at school level. This project concerns that question. We set out to consider what happens when a substantial number of teachers in the same geographical area set about systematically incorporating such a package into their programmes. The teachers in question are religion teachers from the Diocese of Ferns and the software is a state of the art content and delivery package called 'Cyberclass.'

Background

In September 1997 a company called *ScholasTECH Media* approached the Religious Education Department of Loreto Secondary School, Wexford. They were in the process of developing a multimedia CD-ROM based on the new NCCA Religious Education syllabus for Junior Certificate. This was to be called *Cyberclass* and was intended to motivate and engage students through quick and easy access to material. The expectation was that *Cyberclass* would facilitate a multi-media method of teaching which enhanced learning and retention through the use of interesting text, graphics and animation.

The prospect of working with this programme was doubly attractive — not only was it pushing the frontiers of in-class ICT usage, it was also a product tailored to the Irish setting and context — a rare thing indeed. The launching of SIP provided us with a perfect opportunity to take up this challenge. Initial discussions between NCTE, *ScholasTECH Media* and those of us interested in the idea led to an expansion of the project to cover the entire diocesan area. SIP 013 became a two-year project intended to enable teachers and students of Religious Education in the Diocese of Ferns to use *Cyberclass* and subsequently to evaluate its educational merits.

Our project goals were ambitious. Essentially, we hoped to persuade a large group of teachers to change their teaching methodologies in order to embrace the possibilities of ICT in the classroom. Initially, we had no real idea as to whether these teachers would wish to participate in such a project. However, we knew that RE teachers are open traditionally to new resources which help teach what is often perceived to be a difficult and under-resourced subject. Early misgivings were soon overcome as we discussed the idea with an ever-widening circle of colleagues.

Furthermore, even with the support of NCTE through SIP the *Cyberclass* costings remained daunting. In September 1999, Dr. Brendan Comiskey, the Bishop of Ferns, guaranteed to underwrite the funding for this project. This guarantee was crucial to the progress of the project as it allowed the schools to buy the software at a greatly reduced price. Indeed, without it the project would have been abandoned. On the strength of this decision, we co-ordinated a presentation of the *Cyberclass* project to the trustees of the various schools. Based on this, the trustees became interested and consequently encouraged their teachers to participate. In hindsight, the initial financing of this project was probably among its greatest challenges.

Early Stages

Convincing school trustees of the value of a project is one thing, convincing the schools and teachers likely to be most actively involved, is another. Persuading the schools of the diocese to participate in SIP 013 proved also to be a major challenge. When we had originally conceived the idea on an RE/ICT project, a letter was sent out to the diocesan schools inviting them to a demonstration of *Cyberclass*. Unfortunately only four schools attended. These were worrying times as we obviously needed as many on board as possible to help with the ongoing financing of the project — along with justifying the hardware element which NCTE was providing. Thankfully, a decision to make individual visits to the schools to 'sell' the project idea to the various Religious Education departments was much more productive. After these visits, 18 out of the 20 possible schools agreed to participate and each agreed to pay a nominal sum towards the cost of the software. We were up and running with a project involving over 40 teachers and approximately 2,000 students.

Training was seen from the outset as a key determinant of success. After lengthy discussions we agreed that we would need to provide a bespoke training programme for the teachers, designed to meet their needs in relation to using *Cyberclass*. A ten-week programme was designed to run concurrently with the installation of the software in the schools. 'Ownership' is also important to the success of an innovation such as this so we asked schools to 'buy-into' the idea by paying a percentage of the cost of the software, and also ensuring access to appropriate computer facilities for those involved in the project. We realised at the time that this would obviously create timetabling difficulties. Yet this was the only way we would be able to evaluate the effects which *Cyberclass* would have on the entire teaching and learning process.

In January 2000 specialised training for the *Cyberclass* schools began. It took place in the new ICT Centre in Loreto College, Wexford which had been created to support the work of the SIP project. This training — which was well attended — consisted of ten two-hour sessions and focused on the basic ICT skills required to use *Cyberclass* and on giving confidence to those teachers who had little or no previous ICT training or expertise. Two observations on this training may be helpful at this point:

- Because the nature and schedule of the work was partly determined by the needs of the teachers, the first five weeks were actually spent on developing very basic ICT skills. Those who attended these weeks were comfortable with the pace and felt no pressure to progress any faster than they wished.

- There was a marked unwillingness among project teachers — even the more ICT literate — to use *Cyberclass* until they had acquired a high level of confidence through their training. Indeed, training has become the key aspect of this project and will be returned to later when we look to the future and the remaining challenges.

The *Cyberclass* project was formally launched by Dr. Brendan Comiskey, Bishop of Ferns, in Loreto College, Wexford on the 2nd of March 2000. Some specialist training was included in the proceedings of the day which fifteen schools attended. (It seemed a shame to miss the opportunity!) The launch itself was equally well attended with representatives from several local organisations and from the local media present. Due to the launch the project received extensive coverage in the local press and radio.

Impact on Teaching and Learning

By May 2000 the initial milestones that we had set ourselves had been reached: the teachers had received their training; the project had been launched; and the software had been installed in the project schools. The challenge now lay in finding out how individual teachers were coping with

Cyberclass and then encouraging and supporting those who were having difficulties.

Gauging the full impact of any major teaching innovation can be a difficult and imprecise business. Change comes slowly, and takes time to percolate throughout a system. So when in September 2000 all the participating schools were visited in order to assess how they were using *Cyberclass*, our expectations were high but tempered by a knowledge of this reality.

As a result of these visits the schools could be seen to fall into one of two broad categories:

The first category contained those schools that were actually using the software to support their RE programme and whose teachers had managed to gain access to appropriate ICT facilities. Out of the eighteen participating schools, five were using *Cyberclass* in this way. It was not too surprising, perhaps, that these were the best equipped schools in the project. What was surprising — and a little disappointing — was that all of them were encountering technical difficulties (principally hardware-related) which were slowing down considerably the work of the project, and proving a source of frustration to teachers and students alike. In September alone one school had to be visited five times.

The second category contains those schools that had not been able to use *Cyberclass* for a variety of reasons. Two schools were experiencing such difficulties with their ICT Centres that it was actually impossible to use *Cyberclass*. In one of these schools we suggested that they invest in a laptop and data projector to overcome their difficulties and as a result that school now has a mobile ICT unit which has added an extra dimension to the project. Hardware failure and inadequate server and network arrangements effectively made the project impossible to pursue in others schools. However, teacher reluctance to use *Cyberclass* if they were likely to encounter technical difficulties without having the competence to deal with them, also emerged as the key determinant of project activity. Where teachers felt exposed because of their reliance on shaky or unstable technology, they simply would not take the risk involved.

Clearly, a direct relationship was emerging between the use of *Cyberclass* and the level of dependable ICT facilities in the school. This is understandable: no teacher wants to be made look incompetent, professionally. What was more difficult to understand was that despite the specialised *Cyberclass* training they had received, a number of teachers in schools where the infrastructure would seem to support project activity also shy away from taking a class into the computer room and using *Cyberclass*.

In response to this emerging picture, we began a process of visiting each of these schools individually to encourage and support them, and we have also arranged a second training programme for the teachers who need it.

Teacher Response to Cyberclass

Why would RE teachers agree to buy an ICT programme that was previously untested; travel to Wexford on cold winter nights for training; and agree to alter their tried and proven traditional methods of teaching? There are probably four main reasons:

1. One of the most noticeable features of SIP is that it is often driven by teachers who encourage other teachers to become innovators in the use of ICT in the classroom. This is certainly true of the *Cyberclass* project. We found an element of trust here which was crucial to the success of our SIP project, and we feel strongly that this is something that can only come from within the teaching profession.

2. Teachers are genuinely interested in gaining ICT skills. IT literacy is increasingly seen as a professional value and the training which was offered in relation to our project was specifically designed to address the context of integrating usage into classroom practice. It was also free of cost to the participants and travelling expenses were provided.

3. Traditionally RE has been perceived as a text-locked if not even a 'boring' subject. *Cyberclass*

is designed to motivate and engage students with quick and easy access to material through the use of computers using text, graphics and animation. This represents a very attractive proposition for teachers who are battling to make their subject interesting.

4. *Cyberclass* is based on the new NCCA Religious Education syllabus, which most RE teachers intend to teach. However, in common with all new syllabi, resourcing the new programme was likely to prove very expensive for schools. *Cyberclass* represents an attractive and innovative multimedia package of RE content material, at a fraction of the price alternatives could be expected to cost.

This project is of course not yet complete and so we have no 'final' conclusions as to how teachers respond to using *Cyberclass*. Much remains to be done in terms of testing the packages out exhaustively. Early observations would however give some indications of what we are seeing when teachers are asked to abandon textbooks and embrace the world of ICT:

The initial — and constantly repeated! — request from teachers is for training in the use of ICT in the classroom setting. In this project, such training has become the key to successfully encouraging teachers to use *Cyberclass*. Coupled with this is the need for constant support from a co-ordinator who knows both the package and the teaching world. SIP facilitates such support but this raises the obvious question as to the incorporation of ICT into teaching and learning outside of a SIP framework. We would feel strongly that a supportive infrastructure — both technical and pedagogical — is crucial to the process of incorporating ICT into the Irish education system.

When you introduce a substantial content and delivery package such as *Cyberclass* into the teaching of a typical second-level school, problems will emerge — both in relation to the package and the equipment infrastructures that the school has in place. Invariably one or more computers will be 'down' in the ICT Centre and the package itself will throw up some technical difficulties when in use. This disrupts the flow of a lesson and takes time to remedy. If the teacher cannot fix the problem, many feel inadequate. But in reality this is a reflection on the inadequacy of schools' ICT Centres to cope with the demands of teaching a subject through advanced ICT teaching and learning packages. Of course, sometimes it is possible to ask a pupil for help with a problem and this has its usefulness. What we need to bear in mind however, is that this can change the pupil-teacher relationship in a way that may still be problematic within the culture of particular schools.

We feel that widespread adoption of ICT-based teaching and learning packages would also have profound implications for the layout and use of school buildings. In all but a few schools, substantial amounts of extra ICT equipment is likely to be needed in order to create computer rooms to ease timetabling congestion in existing facilities.

Finally, we would suggest that the use of packages like *Cyberclass* affects classroom management and lesson timings, as it usually takes much longer to power-up a system and then navigate through software than it does to open the page of a textbook. If — as we are starting to suspect — the learning outcomes justify this use of time, then there may even be implications for the way we structure and run the school day. The use of *Cyberclass* also requires greater preparation before class as the teacher must be able to navigate through the software and know the location of the material that is required for class. Unfortunately unlike a textbook, this can't be done in front of the fire at night! Flexible solutions — in the form of laptops or on-line access at home to the materials (appropriately costed to the school) — are likely to be required if this difficulty is not seriously to hold back the work rate in classtime.

Pupil Responses

Neither at this point can we offer definitive conclusions as to how pupils respond to using and learning through *Cyberclass*. Nevertheless, a number of useful observations may be made based on what we have seen to date across the more active project schools:

There is little doubt that it is far easier to motivate students to study RE through using *Cyberclass*. Some of the project teachers find that their students are more attentive and less easily distracted or prone to talk to each other when they should not. But it should perhaps also be noted that students can complain that their eyes are sore after extended use of the materials.

The students often offer (unsolicited) positive opinions on *Cyberclass* — saying for example that its not 'boring like the textbook'. They talk about the package as 'interesting', 'fun'. A sense of this comes through in the following comment from a fifth year student at one of the project schools:

> *"I found that because it wasn't from a boring textbook I took in much more of the information. . . Because the text was broken up and I was interacting with it, it made it more interesting. The only disadvantage was that I was starting to develop a headache by the end."*

They would also see *Cyberclass* as having strong educative value: a number of students have claimed that it is easier to learn from it. Consequently, it can be easier to teach historical and contextual material — say, about the life of Jesus — than might otherwise be the case. For example, when learning about the groups in Judaism at the time of Jesus, one student remarked:

> *"It paints a good picture in your mind about what they were wearing and what they looked like."*

Students also comment on the fact that they were picking up new ICT skills while using *Cyberclass*. Although not too surprising, this is nevertheless important. 'Hidden' learning is a significant bonus in any teaching context — and acquiring ICT skills is no exception.

Obviously such observations needed to be treated cautiously. But they offer some support to the idea that packages like *Cyberclass* may make enough of a difference to be worth further, more systematic research and investigation.

The Future

In September 1999, two years seemed like a long time in which to achieve the objectives of this project. Progress has been made and the level of participation and support from so many schools has certainly exceeded initial expectations. After all, 18 schools have set out to embrace the use of ICT and integrate it into their day to day work in RE. Yet one cannot help feeling that there is so much more still to be done.

Perhaps this project was too ambitious from the start. Quite simply the introduction of *Cyberclass* has been far more challenging than anticipated. But, clearly, what we are doing holds much potential for research into the future of ICT in Education — time rather than enthusiasm is now our greatest enemy. The *Cyberclass* support structures cannot last long beyond the end of project funding. These are indispensable to the work in progress.

Given the timescale remaining, we have prioritised our efforts as follows:

1. A special training course has been arranged to begin in February 2001. This will seek to address the needs of teachers in project schools which have successfully begun to use *Cyberclass*. This eight-week course will address issues pertinent to the use of *Cyberclass* such as basic IT skills, using *PowerPoint*, Internet access/email, and file management.

2. The SIP co-ordinator will continue to visit schools individually to give them the support and encouragement that they require on a constant basis. This is crucial to the success of this project.

3. Our research will continue into the use of *Cyberclass* within the schools. In particular, we will try to assess whether or not *Cyberclass* aids retention of material and learning. We need also to evaluate how using *Cyberclass* impacts on teaching methodologies and the pupil-teacher relationship.

Concluding Comment

Based on the experience of this project there are some serious questions to be asked as to whether the Irish Education system and the broad mass of our teachers are ready to embrace ICT in ways that fully exploit its benefits.

Technical difficulties are a constant hindrance to experimenting with ICT — even in settings like ours that have benefited in terms of equipment infrastructure and training under SIP.

Teachers need — and will continue to need for some considerable time to come — extensive training before they will feel confident in this new environment.

Perhaps it would be easier to introduce teaching and learning advances such as *Cyberclass* into Irish schools in five years time. Then again, perhaps not — there are no guarantees that either the infrastructure or training issues will be any less of a problem at that point. The future has to start sometime — after *Schools IT 2000* seems as good a time as any.

ICT within the *Local History of Castlebar* Project

Adrian Keena

Introduction

Our project emerged from a general desire, by a group of teachers at our school, that children would develop a sense of place and a particular desire to mark, in a significant way, the bi-centenary of 'The Races of Castlebar' in 1798. Luckily, the Revised Curriculum supports an emphasis on locality and also supports the methodology we employed — that of developing children's research skills through field work, collating and recording data. This is where we hoped technology could gainfully be employed, as our end goal was to be produce a CD of children's work and make this available to education centres around the country.

We also hoped to expand our school Web site with simple local history input. We were fortunate in that, at no stage, did our targets feel unreachable — previous experience allowed us the foresight to ensure realistic goals were set.

The full list of goals of our original SIP 019 submission was as follows:

- to enable children at the schools to become aware of a range of ICT skills
- to encourage a love of our local history through hands-on data collection, analysis and presentation of findings, and exploration of the music of the era
- to enable teachers/children to experience the integration of multimedia as a valuable curriculum support tool
- to further integrate the use of ICTs into as many curriculum areas as possible

These goals led to the formation of the following concrete objectives:

- to produce local history multimedia stacks throughout the school — making use of the wealth of raw data available
- to organise and compile these stacks in CD format
- to re-enact scenes from local history events using appropriate costumes and props and to include videos of these events in the stacks
- to record audio files of dramatized scenes from local history with appropriate music of the era
- to include some of the stacks, video and audio files on an enlarged Web site
- to share our local history information, through email projects, with schools in towns with which Castlebar is twinned

Project Scope

Being honest, at the time of submission, we were more concerned about integrating our own staff, than involving other schools. Our school is a large, all boys, urban school with a staff of 21 teachers. This project provided the vehicle for as many staff as possible to get involved with their own class, on whatever aspect of local history they wished to select. Twelve chose to participate spanning the full spectrum of primary school from Junior Infants to Sixth Class. Of these 12, 11 are still involved, and one other has joined. Naturally, the topics chosen varied according to ability and

revised curriculum guidelines for that class. (The appendix contains a brief description of the work undertaken by the different age-groups.)

Defining Characteristics

Two things in particular helped shape the SIP 019 project:

In the first year of the project, six of the school's teachers were working towards Masters degrees in ICT in Primary Education. This was highly significant. It is fair to say that the level of ICT skills these teachers had were well ahead of many of our colleagues — all six were taken on as NCTE tutors, further enhancing their personal ICT skill base. The availability of such a skill base obviously assisted the progress of the project, even more than training courses, as a teacher in difficulty had immediate access to someone who could assist them.

At a very early stage of preparing the final submission of the SIP project, in a separate development, every school in the Castlebar area was asked by the Information Age Town Committee (CIAT) to prepare an ICT project submission. The CIAT committee was given a copy of our SIP submission with a suggestion that, instead of the school endeavouring to undertake two different projects, the CIAT might consider co-sponsoring our SIP project. This suggestion was taken on board. As our Web site is hosted on their server, they have kept a keen interest in developments and have been very supportive throughout, affording us access to technical support, particularly with Web site requirements, when required.

The Expected. . .

To date the *Local History of Castlebar* Project has progressed almost exactly as we planned.

There have been many highlights, moments when we were thrilled to be part of an important experiment. There were also moments when we wished the project would go away! These key moments included:

- the arrival of funding and hardware which we were beginning to think would never happen
- the successful completion of three planning days for participating staff, the product of which was a completed workplan for each aspect of the project
- the staging of our play about 1798 — 'The Races of Castlebar'
- the launch of our first Web site
- the thrill of hearing our play 'Coranna' live on the Internet for the first time

. . . and The Unexpected

Of course some of the happenings and consequences of our involvement in SIP were wholly unexpected and added a totally different dimension to the project and its outcomes. Some of these were:

- the unstinting support given to the project by parents, even financial support. One parent, the owner of a cable manufacturing plant, provided network cabling for the entire school, such was his enthusiasm for the work in progress. Others showed their interest by attending our first Technology Night — the attendance being about four times greater than anticipated. Also, on numerous occasions, it was evident that if a pupil was asked if they could stay back after school to work on an aspect of our SIP, a probable no became a definite yes once it was discussed with parents on the phone and alternative arrangements for collecting the child had been made.

- the success of our participation in the *Young Scientist Exhibition.* When we heard that Séamus Knox, National SIP Co-ordinator, was seeking schools to participate in the YSE, we contacted him and offered to put together a display of our work to that point. This acted as a great focus and deadline within the school and the experience for the two teachers and eight pupils involved was very positive. Again, parents showed their total support, as twelve out of the sixteen parents travelled to Dublin to see the exhibition. One parent has since provided a printer for the school — again unsolicited sponsorship of a personal nature — but very reassuring and real evidence of parental support.

- A quite extraordinary — but pleasing — side effect also resulted from our participation in YSE. We were asked if we would allow a team from the Organisation for Economic Co-operation and Development (OECD) to visit our school and carry out a week long survey on the influence of ICT on teaching and learning in our classes. This was part of a major international survey of cutting-edge practice in education, taking place under the heading of *Schooling for Tomorrow.* The findings of this report can be found on the OECD Web site.

Milestones

It is unusual in primary education to receive significant funding for a project. As a school we had made at least six project submissions over recent times and while none were actually rejected, neither did we receive funding for our ideas. This became very frustrating. Indeed, even when we got an invitation to the national launch of SIP at University College Dublin we still did not know that we had been successful in our bid! But that may have been due to the frantic pace at which events began to happen nationally at that stage more than anything else. However, until the first cheque arrived in the post there were many sceptical teachers in the school! This was unfortunate because most of the first term was lost. But it was also inevitable — it simply was not possible to book speakers, plan tours etc., when we were unsure of our funding.

A significant number of days substitute cover were allotted to the SIP co-ordinator for project management. Taking these days, however, is a different matter, as any teacher concerned about the progress of the children in their care can testify. In our school, we decided to assign some of these days for project planning — each grouping of teachers from infants to seniors meeting together to put a programme of work in place. The project team planned out the day in advance and put a framework document in place. It was expected that all important planning related to a given aspect of the project be completed by the day's end and, in the main, this happened. The ICT advisor from our local Education Centre was also invited to meet each group and assist the planning process. Time was also allocated in the day for tracking down resources, booking coaches etc. These days proved much more successful than we could have hoped for, involving staff fully in the project and committing them to its success. Later, when reflecting on the project process, these teachers all referred to the planning day as being very significant.

Certain problems during the lifetime of a project seem insurmountable, so when they are overcome successfully it gives all concerned a great boost. Such can be said of the launching of our first Web site and the inclusion on that site of sound and video files. The learning curve involved in achieving such breakthroughs is steep but very rewarding. We were unaware at the time of submission of the importance of file size when considering the Internet. Audio files are very big, so when the entire play could be put up on the Internet, via audio-streaming and the download wait was only a half a minute, it was special. Video files are even larger than audio files and demand quite an amount of preparation before they are ready for inclusion in *HyperStudio* or launched on the Web.

We have succeeded in staging a play on 1798 which was captured on video. We have also recorded a radio play called 'Coranna' about a horse that won the Chester Cup at the height of the Famine, the winnings of which were used to feed the hungry of Carnacon, close to Castlebar. This has now been added to our Web site in its entirety. We are currently at the stage of organising and

editing our *HyperStudio* stacks to ensure that the work presented on the CD does not pose copyright difficulties because of sounds or pictures used. One teacher has taken responsibility for our new SIP Web site and that is now also progressing well.

To say that all consequences of SIP were positive would be less than the truth. The workload of the three teachers responsible for co-ordinating the project has increased dramatically, including sorting out technical and software problems, organising speakers, collecting, collating and editing *HyperStudio* stacks, preparing work for our Web site etc. Whether other teachers in other schools should also be expected, or would be willing, to devote so much extra-curricular time to integrate technology is debatable. In no other profession is so much extra expected without financial reward. ICT integration cannot be sustained without major investment in this area.

One major area of disappointment has concerned our plans to share work on our local history with schools in Castlebar's twinned towns i.e., Hochstadt in Germany, Auray in France and Tameside in England. Sadly, all efforts to find schools in these towns to participate in email projects have been in vain. A school in Tameside did take up the mantle for a short time but this was short lived due to constant technical difficulties with their server. Ironically we have received visiting groups from both Hochstadt and Tameside to our school. So though the links may not have been fruitful in the short term, we are hopeful for the future and have maintained email contact with Tameside in particular.

Impact on Teaching and Learning

The great philosopher Socrates once wrote: "The unreflected life is not worth living." Reflection can be easy: honesty about what we come to see and understand is not always so.

In our school the use of technology is slowly becoming an accepted part of everyday lessons, but this is happening slowly, even though we have had access to computers for almost ten years. The SIP project provided a major boost in terms of available equipment and focus. Papert (1993a) compared a hospital to a school and posed the question as to whether changes have been evident over fifty years. In the case of the hospital, he saw major changes in methodology and an embracing of technology, but in the case of the school, he felt methods have remained static. One important lesson we have learnt during SIP, is that in the absence of adequate funding from the government, be patient.

Although we have not seen a noticeable positive impact on formal learning since SIP began, neither have we seen any negative impact. We arrived at this conclusion by examining MICRA-T and SIGMA-T standardized tests over the last five years. However, this is not too surprising and as a school we are increasingly convinced by arguments that children need to be technologically aware and would feel — strongly — that the new literacies associated with this are difficult to quantify in such a traditional manner. Children need to be able to think and plan for themselves, at least in part because the demands of the workplace they will enter are changing so dramatically. Whether you prefer the three T's mentioned by Galbreath (1998) of technology, teaming and transference or Thornburg's three C's (1997), cited in Ertmer (1999), that of communication, collaboration and creative problem solving, these are the skills employers want. There is a definite shift in emphasis from the individual acquisition of information to developing strategies that use technology to assist in solving problems, often while working as part of an effective team. Though we work extra hard to afford children the opportunity to work in teams, at and away from computers, real change takes time. We believe that implementing effective changes in how we ourselves teach also takes time, effort and practice. SIP has been a major force in facilitating these features of our teaching and learning activities.

The diversity of content and approach involved in our *Local History* project makes it hard to pick out any one definitive example of how we try to incorporate these information age skills into our teaching and learning. However, elements are identifiable in the activities surrounding our play on 1798 — 'The Races of Castlebar'. It is very difficult to put the work into neat segments and arrive at a set of tidy lesson plans that would eventually culminate in the presentation of the drama. Anyone who has been involved with school plays knows that when a performance date draws close, large chunks of time are allocated. What is worthy of note is that all of the backdrops, artwork and publicity were done by the class, as was the script itself — from conception to final staging. Such a variety of activities provided plenty of opportunity to involve all the class, and technology was used throughout, facilitating, for example:

*   drafts and redrafts of the script
*   digital photographs of rehearsals and preparations for their inclusion on our Web site
*   notices and fliers publicising the date and time of the performance
*   digital video camera recording of the play for eventual inclusion of snippets on our Web site and in *HyperStudio* stacks on 1798.
*   word-processed essays and reports by pupils on what it was like to be involved — now included on our Web site

What learning took place would be hard to quantify fully. Whether the children have a particularly elaborate understanding of their own local history or only about 1798 is debatable, but perhaps it is time we reassessed how and what we consider learning to be and how we quantify that learning (Hooper, 1990). They certainly gained from the process of putting the drama together and also gained valuable teamwork skills when moving it from page to stage, and then onto the Web site!

For anyone seriously seeking ways of integrating ICT into the life of a school, a school Web site is strongly recommended. A Web site has the immediate impact of involving most of the school, giving a ready-made impetus to normal class work as it will be viewed by a worldwide audience and demands little alteration to classroom practice. The restructuring, revising and spellchecking involved in the preparation of stories, poems and essays for the Internet are all very commendable activities and very much in line with the thinking of the Revised Curriculum. Children take turns to go to the classroom computer in twos and threes and work on their stories or news items until they are happy with the end product. Sometimes their work can be completed at one visit and on other occasions, several visits are required. To add colour to their Web site entry they are also allowed to design their own graphics. Naturally, the same principles apply to SIP project work. We always take care to ensure equal time is allotted to each pupil though this is not easily monitored due to pupils being absent, or at learning support class etc., when their turn comes round.

Another recommendation, whether using *Hyperstudio, PowerPoint* or other project software, would be to consider the approach to such applications taken by Wilhelm, Friedemann and Erickson (1997). This book is a clear and practical guide to the difficulties that good project work presents, and how ICT can be included purposefully but without dominating the project process. Wilhelm and Friedemann are teachers with great experience of integrating technology into their classroooms: what they suggest is rooted in that reality and it shows. For example, they advise on planning, researching and filtering of information and the creation of hand-written cards, containing all information to be cited in the project and indicating the links between cards. Only after peer and teacher evaluation of the work to that point, are the pupils allowed commence the computer stage. The simple lesson is to keep children away from presentation packages until they have fully researched and digested the information they are going to present. We try to follow their guidelines but it is a learning curve for teachers too.

Interestingly, we have noticed that the children who adapted best to this approach are now relatively independent learners — although it has taken eighteen months to get to this point, and the number who have succeeded to an acceptable degree is small. In the preface to a relatively new edition of *'Mindstorms'* (1993b), Papert, reflecting on earlier research, noted similar findings. Hence the need for patience on all sides.

One final recommendation would be to make a deliberate effort to communicate the work that the school is involved in to both parents and the larger community. Our experience would be that

parents wholeheartedly support ICT integration but do not necessarily know what is going on in the school or have only half the story. On our Technology Night we were amazed how little the parents were aware of the work being done by their own sons. Making the wider public aware through local papers takes time and effort but it may pay off through assistance or funding or in some other unexpected way. Apart from our link with the Castlebar Information Age Town Committee, we have also developed strong links and received great support from Mayo Education Centre, Castlebar Library and Mayo County Council.

One very valid way of keeping communication channels open with home and improving home/school relations is through making ICT facilities available for parent classes. We have already run a beginners' course for parents at the school and are now following this with an ECDL course. The tutors, who need not necessarily be teachers, are paid for their time. Parents appreciate the opportunity to at least begin to come to terms with technology.

Remaining Challenges

What will define our project's success? Our project will have been successful if we have opened up new ways of learning for those pupils who took an active part, and if we have afforded teachers valuable opportunities to experiment with new and creative ways of teaching.

With every day we are inching closer to our goal which is seamless integration of ICT across the curriculum and across all the school. ICT literacy is rising all around the school. For example, at the end of 2000, two Sixth Class pupils completed the majority of the work involved in compiling our Christmas Web site. They collected, collated and edited the work from the participating classes in the school. This is starting to approach our learning and teaching ideal — pupils who are self-motivated involved in making decisions for themselves and taking responsibility for their learning — learning that is fun, challenging and involves team decisions. Where those two have gone, others will follow. The barrier has been pushed back just a little further.

The same applies for teachers. Several classes did not use the school's ICT Centre some years ago, now all classes avail of the facility. Those who have been open to change are adapting with success, an example being the classroom teacher involved with the Christmas Web site. He afforded the pupils the space and time to work on the site and so took on a new role as facilitator. Increasingly, this would seem to be a direction that we as teachers must travel — allowing those who can to work away, with guidance, and spending the time with those who have real learning difficulties.

In a more clinical sense, our project will have been successful if we produce a worthwhile example, on CD-ROM, of children's work on local history — one which proves of assistance to other schools that are attempting to integrate ICT. We would also hope our new SIP Web site would provide a flavour of Castlebar's colourful past and act as a guide to other schools on how to produce a project Web site. Though our project is based essentially on process rather than product, we intend to repay the financial investment afforded by the project with such concrete evidence of work completed.

Finally, our project will have been successful if in years to come, pupils return and reminisce about the project that sparked their interest in local history or technology or both. They may even point out that the research skills they developed through the project were not used for history but put to good effect in some other area of personal interest. It is very rare that children return and reminisce about repetitive English, Irish or Maths exercises and how much they learnt from yet another comprehension activity. Though these exercises may be necessary, school should strive to achieve more, should seek to motivate children to become independent learners. We feel that our SIP has done much to assist in this.

To conclude, over this Christmas holiday period, a group of Third Class pupils were asked to return to school to complete work on some *HyperStudio* stacks. A visitor remarked that they were great

to be in school during their holidays, to which one replied: "It's not like being at school at all, it's fun". Would that school could always be like that for all pupils!

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Appendix

Participants and Topics in SIP 019:

Class	Topic	Stacks compiled by:	Other Work
Junior/Senior Infants	The Story of Me My Home	Class teacher — drawings by pupils	Stories — drawings
First Class	Me and My Family	Class teacher — some writing and drawings by pupils	Stories — drawings
Second Class	Me and My Family (inc. grandparents)	Pupils — assisted by class teacher	Visits by some grandparents – drawings
Third/Fourth Class	Local Buildings (churches and factories) Streets of Castlebar Turlough House Castlebar Mitchels	Pupils — edited by teacher. Stacks linked by pupils.	Field trips to local factories, churches, Mitchels pitch, Turlough House. Invited speakers.
Fifth/Sixth Class	Michael Davitt and the Land League Story of 1798 The Famine and Coranna Ceide Fields Our Family Tree Famous People	Pupils — edited and linked by pupils	Radio Play Play of 1798 events Visits to Strokestown House, Davitt Museum, Ceide Fields, etc. Invited speakers.

Figure 7: Humbert addresses the people of Ballina.

Figure 8: The Irish and French attack the English position at Sion Hill.

Data Logging in the Teaching of Physics and Chemistry in Second-Level Schools

Declan Kennedy

Introduction

The central features of practical activity in science have always been observation and measurement. As part of such activity, pupils are exposed to a variety of instruments that are capable of taking measurements. The results of observation and measurement, when processed, are presented in graph and table format and a collection of results is known as data. In the past, the gathering and presentation of data was done manually but modern computer technology can now assist greatly in this process. This is referred to as *computer-aided data logging* or simply *data logging.*

Of course research and industry have been using computer-aided data logging for decades and data logging has been used in the teaching of Science in a number of countries since the 1980s. Over the past two decades in particular, the use of computers in US and UK schools has developed from being simply an aid to teaching of Mathematics and Science, to being an indispensable part of the entire curriculum. In Science teaching, this development has given rise to exciting new approaches in practical work involving data logging. However, computer-aided data logging has not yet established a place in Science education in Irish second-level schools.

The purpose of our Schools Integration Project was to address the use of data logging in the teaching of Physics and Chemistry at second-level in this country, and to make recommendations on the more widespread use of this technology within our schools.

Background

All SIP projects are that bit different in their origins and background. Ours is no exception. University College Cork (UCC) Education Department is actively involved in educational research nationally and beyond and so became very conscious of the progress being made in the areas of educational data logging in other countries — particularly in the UK and the USA. In co-operation with the Irish Science Teachers' Association (ISTA) and Dr. Colm O'Sullivan of UCC Physics Department, we drew up a bid for project funding which would allow us to explore the possible application of data logging in the teaching of second level Physics and Chemistry in Ireland.

So while we were perhaps unique — in that the initiative came from the UCC side — the project was conceived from the outset as a partnership between ourselves, the ISTA and the schools which were to become involved.

Carrigaline Community School, Carrigaline, Co. Cork was nominated as the lead school and Mr. John Hourihan, a member of school staff and a part-time lecturer in ICT at UCC, was given partial secondment to co-ordinate the project. In total, twelve partner schools were selected on the basis of their close links with the ISTA and of having a proven record in practical work; six to investigate data logging in Physics and six to investigate data logging in Chemistry. (Full details of the schools involved in our SIP are given in the Appendix.)

Aims and Objectives

The aim of our project was to find defensible answers to the following questions:

- How effective is data logging in teaching Physics and Chemistry at second level?
- What is the most suitable data logging system for Irish second-level schools?

A work programme was drawn up and our objectives were outlined as follows:

- to investigate how data logging using computer technology can enhance practical work in Physics and Chemistry
- to ascertain the most suitable data logging computer equipment for use in teaching the Science curriculum in Ireland
- to develop students and teachers competence in using data logging equipment in laboratory work
- to investigate the factors involved in training teachers in the use of computer technology in the teaching of Physics and Chemistry
- to identify good computer-based teaching methodology in the areas of Physics and Chemistry

Progress to Date

A total of 20 teachers became involved in the project. A number of training courses for these teachers were conducted in UCC using different types of data logging equipment available. Of the various systems studied, three commercial brands of equipment were selected for further evaluation and class testing in schools.

Initially, it was hoped that this equipment would be rotated among all the schools involved. However, due to time constraints, this rotation took place only on a limited scale. Teachers were asked to use the equipment as comprehensively as possible in their teaching. In addition, they were asked to write up four specific experiments (agreed at one of the planning meetings) and accompanying notes for teachers that would be relevant to either the new Physics syllabus or the new Chemistry syllabus. In some cases, this involved the modification of experiments in laboratory manuals supplied by the equipment manufacturers so that the material would be relevant to the Irish curriculum. In other cases, the experiments were designed by the teachers themselves. As the project progressed, it became clear that some brands of equipment were far more satisfactory than others. In their final report, teachers were asked to describe their experience of using the different brands of equipment and, based on this experience, to make a recommendation regarding the one they considered to be most suitable for Irish second-level schools.

Phase 1 of our project is now completed and a detailed report has been submitted to the NCTE and to the Department of Education and Science. (A copy of this report is available on the SIP Web site at http://www.sip.ie/, under the general heading of Science and Mathematics projects.)

Outcomes and Recommendations

The work of the project to date has been evaluated by means of school visits, classroom observations, interviews with teachers and the analysis of questionnaires.

Our main findings may be summarised as follows:

Effectiveness of Data Logging in the School Science Laboratory

- The teachers found that data logging had an enormously beneficial effect on classroom teaching.
- Using the data logging equipment, teachers could carry out a wide range of experiments in the classroom. A total of 25 Chemistry experiments and 25 Physics experiments relevant to the new Physics and Chemistry syllabi were written up as part of the first draft of a laboratory manual.
- The plotting of data in real time, as it is acquired, enhances the students' understanding of the graphical representation of data.
- The tedium of gathering data in scientific experiments was removed and the time bonus allowed students to focus on the real task at hand, developing the true scientific method.
- Results could be obtained with greater accuracy than before. Demonstrations could be performed very easily. In many cases, experiments could not be done without the aid of this new technology.
- Data logging greatly facilitated the teaching of difficult concepts.

In short, the data logging equipment has been of enormous benefit in the teaching of Science at all levels.

Most Suitable System for Second-level Schools in Ireland

When the project teachers were asked to recommend a data logging system for purchase on a national scale, they were unanimous in selecting the *Pasco* system. A number of reasons were given for this recommendation:

- The high quality of the *Pasco* hardware was particularly suitable for use by both teachers and students. In contrast to other systems, the *Pasco* hardware was robust and trouble-free.
- The *DataStudio* software was far superior to any other software assessed. It made the use of the sensors very easy and allowed a number of useful on-the-fly decisions — for example the scale of the axis could even be changed during the experiment. Furthermore, manipulation of the results was very easy once the experiment was concluded.
- 'After sales service' was an important factor in the final decision. When the teachers had a query about software or hardware, they sent an email to the *Pasco* customer support centre. In all cases, queries were quickly answered to the satisfaction of all. This level of customer care is a necessary consideration when selecting a brand of equipment. Teachers have no access to technicians in school and need to have problems sorted quickly and efficiently.

Recommendations

The most unequivocal recommendation that we can make as a result of our SIP is that data logging equipment for teaching Physics and Chemistry should be supplied to all second level schools by the Department of Education and Science. Computer-assisted data logging in Physics and Chemistry removes the drudgery of the mechanical aspects of measuring, recording and reporting. This results in an enhancement of time spent on observation and discussion. With the aid of data logging, the graph is a starting point for thinking and not the end product as often is the case in conventional practice. But the real benefits of data logging come from immediate observations of the data, asking questions about them, looking for links with other information, making comparisons, making predictions, looking for trends, and so on. We have found that its use in both teacher demonstration and pupil activity has a very positive effect on learning outcomes.

Given the experience of the project schools, we would of course recommend that the data logging equipment supplied be *Pasco* equipment (for the reasons outlined above). It would be particularly helpful if this was 'bundled' for Physics and Chemistry use with a range of appropriate sensors and

probes being supplied. In any event, it is essential in our view that all schools should receive the same brand of equipment.

There are a number of reasons why this is so. It would:

1. facilitate in-service training of teachers on a national scale. If schools have different sets of equipment, the provision of in-service courses would become extremely difficult — if not impossible. It would be necessary to conduct different courses for different brands of equipment. Course presenters would have to be familiar with a wide variety of different data logging systems. Thus, the provision of appropriate professional skill development and support would be very difficult.

2. facilitate local support and peer networking among teachers. Obviously, this would be infinitely easier if all teachers were working from the same assumptions and using the same equipment in the teaching setting.

3. facilitate the production of high quality, supporting resource materials. Science equipment can be expensive and so too can the materials necessary to support their use in the classroom and laboratory. An agreed bundle for data logging would make easier the production of highly relevant, good quality resource materials e.g., laboratory manuals.

4. facilitate assessment of examination work in the state examination system. Should students be asked to describe an experiment in an examination, great difficulty could be encountered in assessment if a wide variety of different data logging systems were in use in school science laboratories throughout the country. Once again an agreed data logging bundle would virtually eliminate this.

5. facilitate the updating of equipment and software for the future. If all schools possess the same brand of data logging equipment, the upgrading of software (and hardware) is greatly facilitated. Software upgrades would be totally compatible with existing equipment and hardware replacement likely to benefit greatly from bulk purchasing.

In addition to the data logging equipment, the experience of our SIP project would strongly suggest that a data projector should also be supplied to each school. When teachers conduct demonstration experiments, the entire class needs to view the data being logged. However, it is difficult for a large group of pupils to view one computer. We have found that a data projector greatly enhances the use of data logging equipment in demonstration contexts. Research has shown that the discussion prompted from the drawing of the graph holds the greatest potential for learning benefits to be gained from the technology. In a demonstration session, such discussion increases greatly when the whole group can see the data-set quite literally building before their eyes, due to the use of a data projector.

Finally, we would see comprehensive and well-supported teacher training in the use of data logging equipment as an essential. The training provided by UCC and supported by the suppliers of our equipment played a critical part in the overall success of our project. Teachers had the opportunity to discuss all aspects of the project during these training sessions. The advice given by those conducting the course and the technical assistance provided by the Physics Department UCC and the Chemistry Department UCC were of tremendous help to all concerned. (In addition, the training meetings proved of invaluable assistance to the monitoring of the project.) We would suggest that a plan for similar, in-service training for teachers in the use of data logging equipment should now be put in place nationally. In parallel with this, the introduction of training in the use of data logging equipment on pre-service training in colleges of education and universities should be considered. A laboratory manual, written specifically for the new syllabi in Leaving Certificate Physics and Chemistry with full details of the use of *Pasco* equipment should be provided to all teachers as part of this training.

Remaining Challenges

Phase 1 of the *Data Logging in the Teaching of Physics and Chemistry at Second-level Schools* Project recommended the production of laboratory manuals in Physics and Chemistry, tailored to the Irish curriculum and for use with Pasco data logging equipment. Phase 2 will seek essentially to address this recommendation.

It is envisaged that our original project team will write the experimental procedures. Six Physics teachers will each be asked to write and class test a number of experiments which will be edited to form a Physics manual. Six Chemistry teachers will be asked to do the same for the Chemistry manual. Consequently, each manual will contain at least thirty data logging experiments for use throughout the syllabi. In line with our practice across Phase 1, a co-ordinator will need to be employed on a part-time basis to complete the administrative tasks of the project and the editing of the manual. In addition, the project team will need to meet from time to time for briefing sessions, standardisation of material, training etc. We currently estimate that a minimum of three such meetings will be necessary.

Our expectation is that these manuals will be edited at UCC Education Department, in conjunction with NCTE for inclusion on SIP Online. It is hoped eventually to supply every school in the country with a hard copy of both the Chemistry and Physics manuals. However, this will depend on the availability of funding for their publication.

We look forward with great interest and enthusiasm to the work ahead.

Conclusion

Through the experience of working with data logging systems in a partnered school setting, and the systematic evaluating of that experience, we have been able to identify what we believe to be the best data logging solution for Irish post-primary schools for teaching Physics and Chemistry.

Resource materials are currently being developed and disseminated through the network of the Irish Science Teachers' Association. Teacher skills in this area will be upgraded through in-service training.

Further research in conjunction with the NCTE and other interested agencies will no doubt be needed to establish further teaching exemplars that maximise the benefit of data logging technology. In addition, broader research needs to be conducted into the strengths and weaknesses of the technology itself. There are likely to be uses for data logging that go far beyond the science areas of second-level education in this country. But it is only through imaginative, school-set research, on the lines that we have undertaken through this SIP project that these are likely to emerge.

Appendix

Schools involved in SIP Data Logging Project

CHEMISTRY SCHOOLS

School Name	Address	Teacher Concerned
Blackrock College	Blackrock, Co. Dublin	Mr. John Daly
Coláiste an Chroí Naofa	Carrignavar, Co. Cork	Ms. Marion Kelleher/ Mr. Declan Cahalane
Coláiste Muire Cobh	Cobh, Co. Cork	Mr. Fergus O'Brien Mr. Tim Cronin
Post Primary School Maynooth	Maynooth, Co. Kildare	Ms. Siobhan McLoughlin/ Mr. Seamus McManus
St. Caimin's Community School	Tullyvarragh, Shannon, Co. Clare	Mr. Jim McNamara/ Ms. Niamh O'Sullivan
Tallaght Community School	Tallaght, Dublin 24	Mr. Pat Hanratty

PHYSICS SCHOOLS

School Name	Address	Teacher Concerned
Carrigaline Community School	Waterpark, Carrigaline Co. Cork	Ms. Miriam Wixted / Mr. John Gargan
Christian Brothers	Sidney Hill, Wellington Road, Cork	Mr. Eamonn Roach
Coláiste Chríost Rí	Capwell Road, Cork	Mr. Noel Brett
Colaiste Phobal Ros Cre	Roscrea, Co. Tipperary	Mr. Michael Maunsell
Presentation Brothers College	The Mardyke, Cork	Mr. Conor Goggin
St. Brendan's College	Cathedral Place, Killarney, Co. Kerry	Mr. Pat Fleming / Mr. Tim Regan
St. Colman's College	Fermoy, Co. Cork	Mr. David Rea

Glenrath.com: The Creation of a Primary Schools' Web Site

Heather Lawson

Introduction

Our project (SIP 039) is based on the creation of a Primary School's Web site entitled — *Glenrath.com*. 'Glenrath' is a fictitious place created through merging the first part of the names of the villages of Glendalough and Rathdrum, both in Co Wicklow, Ireland. We picked this name for our project because it caught nicely the content and tone of what we were attempting to do: create something new and unique, through a joint effort focused on the locality of our two schools. Both schools are rural schools located in a very scenic part of the county and linked by the Avonmore River, which flows from Glendalough, through the beautiful vale of Clara and then Rathdrum. The information on the site deals with our locality under a number of headings that will be familiar to any teacher with an interest in nature and a sense of the local: Flora, Fauna, History, Place-names, Topical, *Coillte*[1] and Tour Information.

The main aims of the project were:

- to lead the children to a greater appreciation and understanding of the richness and beauty of their own local environment
- to allow the schools communities to acquire ICT skills
- to promote the active use of ICT in all classes within the schools

In doing the project we hoped that we, as teachers, would receive the training necessary to create the Web site and that this training would give us the confidence to use technology more widely in our classroom practice. We hoped that, as our confidence and competence increased, we would be able to help the senior pupils acquire the same skills, and that they in turn would mentor the junior pupils, helping them to acquire some of the same skills, as appropriate to their age and ability.

Background

The idea for the project came as a result of networking through our local branch of the Irish National Teachers Organisation (INTO). Significantly, it grew from a curriculum / education issue rather than a technological one. As principals, we were concerned that our pupils knew little of their own local area. Children are no longer walking to school and so are not as aware of the flora, fauna and wildlife of their own locality as former generations have been. We felt that they knew more of the wildlife of the tropical rainforest than of the oak woods of Co. Wicklow! Of course we were also aware of the importance of technology in our world and the need for our pupils to acquire skills in ICT.

Basically, we wanted a manageable project that would bring these two things together, but were not too sure how this might be done. The idea of a Web site soon emerged — and *Glenrath* was born.

Initially we discussed ideas for possible project work, talked about field trips we could arrange and decided that we could involve our pupils in researching some school tour destinations in the locality. We chose to do this because, each summer, thousands of children (mainly from Dublin) visit our area on these tours. The thought occurred to us that our project might be able to provide

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1   The Irish Forestry Commission.

these classes (and their teachers) with easy access to a comprehensive guide to the facilities offered by each venue and also help our own pupils to learn about their own locality in the process. We wanted our Web site to be especially for children, with child-friendly navigation, plenty of illustrations, easy language and some interactivity.

We also discussed possible project partners from industry and decided to ask *Coillte* to become involved. Other suggestions for commercial partners included *Dúchas*[2] and The Wicklow Mountains Uplands Council. On approaching these groups, we found them to be very interested in our project and keen to help. *Coillte* became our main sponsor, and were actively involved. For example, they paid our domain hosting fee and put staff at our disposal for the classroom visits and field trips which have proved an invaluable part of our project. *Dúchas* also has been actively involved especially in the area of teacher support. The Wicklow Mountains Uplands Council played a less significant, but helpful, advisory role.

As teachers, we were very surprised at the goodwill which was available to schools. *Coillte*, in particular, were anxious to have closer links with schools. They are keen to foster a love of forests in primary school children and believe that this will help to reduce the littering and vandalism in the wood lands which has recently become prevalent. Timing was an important issue here also, as *Coillte* were updating their own Web site and wanted to have a link to some children's material. Also, the Millennium *Peoples' Forests Project* was imminent so the partnership between the schools and *Coillte* was to prove mutually beneficial. They provided us with financial backing and expertise and we the schools provided them with an insight into our work and access to our classes.

Three schools were involved in the original discussion: St. Saviour's N.S., Rathdrum (a two-teacher school which became the lead school for the project), Scoil Chaoimhín Naofa, Glendalough (a three-teacher school situated only a few miles away) and Roundwood N.S. (a six-teacher school, also situated within a few miles of the others). However, Roundwood dropped out before the project commenced due to pressure of other work. This left a project involving five teachers, two classroom assistants and approximately 140 pupils. None of us had much in the way of ICT experience or ability, but we lacked nothing in terms of enthusiasm and determination! The two principals worked together to fill in the SIP application form and to create the project outline.

Early Days

A number of important decisions were made in the early days which later stood the project in good service:

It was agreed that responsibility for a particular project theme would rest with a particular teacher and their class. Regular meetings were held involving all of the teachers. Their opinions and suggestions were invited, and taken very seriously. A considerable amount of leeway was offered to the teachers with regard to the choice of themes.

From the outset of the project we decided that *all* of the pupils would be involved in the project to some extent. In the short term, we might do the uploading ourselves but as soon as practicable the pupils from Third Class upwards would become responsible for inputting the work for the site. Of course the degree to which this would be possible was governed by the nature of the classes at our schools — all are multiple classes with multiple age groups. For example, in Scoil Chaoimhín Naofa the pupils are divided between only two classrooms. This meant that children from Second Class upwards created their school's contribution to *Glenrath.com*; they input the work of the Infants and First Class pupils. In St. Saviour's — which is also a two-classroom school — the senior classes (3rd–6th) input the work of their own classroom and that of the junior classroom.

2   The Irish Heritage Commission.

The decision to work in this way was due mainly to the classroom realities of educating in a small primary school. But, in terms of achieving our project goals, it had certain advantages. The main advantage is that pupil numbers are small and so it is possible to work with a small group to teach the pupils new ICT skills. Also, a mentoring approach works well in this type of classroom. The disadvantage is that ICT usage adds another dimension to a classroom that is already very busy in terms of organization. This can be a source of major stress for the teacher — especially if there are technical problems relating to the computer, as this is very demanding on teacher time.

The project was accepted for SIP funding in April 1999 and work began in preparation for the creation of the Web site in May. This was a fair reflection of our interest but also an indication of the pace at which we found we were expected to move. It was also a reflection of our naivete. We very quickly began to come up against difficulties we had never even envisaged.

These would include the problem of accessing appropriate training and actually acquiring the skills needed to make a success of our project. Creating our first homepage also turned into a Herculean labour, in the main, due to the type of technical problems that lie in wait for the unwary first-time Web-spinners. Most critical, however, was the issue of time. To say we underestimated what was involved would be to understate on a major scale. We *totally* underestimated what was involved and — as will become clear — this nearly cost us the project.

Darker Days. . .

During the early summer of 1999 we tried to arrange an NCTE Phase 2 Course for all who would be involved in the project. We had earlier been surveyed to assess current computer skills and training needs, after which, two of the teachers helped put the other teacher and the classroom assistants through an NCTE Phase 1 Course.

But we had difficulty in arranging a follow-on Phase 2 Course due to the Tutors' strike, the huge demand for courses run through Blackrock Education Centre (our 'local' Education Centre), and the high cost of a venue for a locally run course.

In the end a tutor was arranged after intervention by the Director of the Blackrock Teachers' Centre and the SIP office at NCTE. But we still had no venue. Eventually, we decided to run the weeklong course at St. Saviour's NS during the summer break. Scoil Chaoimhín brought their computers across and with some re-wiring at St. Saviour's to facilitate this, we set up our own training facility. Permission from the Boards of Management of the schools allowed each teacher to take home a computer so that the skills learnt could be practiced over the summer holidays. In this way we clawed our way from novice to Phase 2.

Project funding allowed outside trainers to be sourced for a 3-day customized course in the preparation of a Web site, two days in late August and two half days inputting our first sites in October and November. Our trainers — *Internet Publishing Services* — were chosen because they had a link with the locality and also because they were used to dealing with this type of training. This choice was to prove a good one. Having met with the two main trainers and outlined the project and its main objectives, *Microsoft FrontPage* was chosen as the Web-publishing package while *Adobe PhotoShop* was chosen to manipulate the images.

On the first day of our training it quickly became apparent that the level of our skills was way below what our tutor had expected. She quickly adapted her course to enable us to make some progress. Patiently, she demonstrated the skills we needed and then let us practice these in two's at the computer. This type of mentoring was to be used by the teachers with their classes. During those two days our level of frustration was high and we thought we had definitely bitten off more than we could chew, but we were patiently reassured that we could do the site. We decided to begin work with our classes in September, for our first publication, in October.

Once the work in the classroom began and the enthusiasm and interest of the children was aroused, we knew there was no turning back. The teachers would meet at St. Saviour's one night per week to input our class's work. Huddled together around the computer we would input the work, helping each other through the skills. When we had difficulties we would email our trainer. Every second week one of them came to help us. They would demonstrate the skills and then put each of us through them until we felt competent with that specific skill. We soon came to realize that our original plans for the site were way too ambitious and that we would have to reduce the level of interactivity as this would require Java scripts and programming which was far too difficult for us.

At first we had great difficulty with scanning and imaging. This was overcome by Aidan, (one of our trainers) who realised that the scanner had not been installed properly. He used the Internet to download an installation guide and reconfigured it. Then the smart card on our Fuji MX500 became full after taking only four photos. The camera would not allow us to take further pictures and we could not download those we had to the computer, neither could we understand why. This was solved by one of the teachers who took the camera home and studied the settings. She discovered that the image size could be adjusted to allow a greater number of photos to be stored and that *Flashpath* had to be installed on our computers to allow them to recognise the digital images.

All of this of course ate into our timescales so that despite a lot of hard work we were not ready. Most of us were near to tears with frustration.

We decided to postpone the deadline by a month, thus reducing the pressure significantly. This meant that another meeting had to be convened to re-jig the themes but it also gave us time to solve a very significant problem which had emerged concerning the Web hosting of our work.

To our total consternation we had discovered that no server in Ireland was capable, at the time, of hosting a *Microsoft FrontPage* product due to the incompatibility of *FrontPage's* extensions with Web server applications. Eventually, *Internet Publishing Services* suggested hosting the site on a server based in the Isle of Man which solved our problem. *Coillte* paid the fees for the hosting — a generous and welcome gesture of support.

. . . Better Times

The challenge of creating and laying out a suitable homepage was next. Early on, we came to the conclusion that a pie chart would be an appropriate way of selecting the themes and that we would also need an archive section to separate current pages from past ones. One night while discussing the design of the homepage, one of the teachers suggested approaching local cartoonist, Terry Willers, and asking him to customize some icons to signify the various themes. This was agreed and the two principals met Mr Willis and discussed the suggestion. The cartoonist agreed and the result was a wonderful and witty set of watercolour images which were scanned and manipulated by the teachers to form the basis of our page. Some Java scripting was then completed by *Internet Publishing Services* — and it was done. The outcome is a most impressive homepage that entices the viewer into the site, and is regularly commented on by visitors.

Glenrath.com went live for the first time in November 1999. This was perhaps the turning point for the project and remains one of the high points of the project to date. From a technology point of view this was 50% the work of the trainers and 40 % the work of the teachers using the drawings, writing, artwork and photographs of the pupils. The pupils did 10% of that first publication — mainly typing! But the buzz was terrific and how wonderful it was for the children when they got emails from relatives in Australia and the USA saying that they had seen their picture or poem! Our next publication was in December. This time we had some problems with layering in *Photoshop* which were solved by our trainer Nicola. But what was important was that the children were now

taking up the challenge of resourcing the site. For this publication the pupils took all of the digital photographs, scanned most of the pictures and typed all of the text into the existing templates. This was a major step forward.

Impact on Teaching and Learning

When we do work for the Web site, the teacher usually introduces the theme in the classroom or in some cases a visitor does this. In either event, the follow up is usually a field trip. These class visits are very successful — the children become totally absorbed and learn so much. The field trips are also very successful and the children are very enthusiastic about them. On their return to the classroom the pupils do some research, write reports or do some artwork. The teacher corrects these and makes suggestions for improvements. In the case of writing, the pupils re-draft. At this stage the teacher usually selects about four contributions which are read aloud and the class votes for the work to go on the site. Occasionally the report put on the site is a compilation of the work of several children, with a paragraph or so coming from each.

Initially, the class teacher would decide how the pages for up-loading would be formatted, but as the project progressed, the senior pupils became much more involved in the design. We used the tables feature in *Microsoft FrontPage* to help with this, frequently drawing the pages on paper to help us to decide how the pictures related to the text. Only when we have a reasonably good idea of what we want and what we have, do the pupils begin to use the computers. HTML folders and page templates are set up and the pupils begin to create tables and to type up or scan in their work.

Often the work for a publication to our Web-site takes four or five days (this includes class work, research, process writing, artwork and creating the Web pages) and during that time other subjects must be put on hold. For this reason, Web site work might only be undertaken on one or one-and-a half days a week — the other days being devoted to 'normal' class work. For this reason also, a lot of the preparatory work is done on paper as part of day-today class activity.

However, as teachers we were sometimes surprised by the speed with which the pupils learn ICT skills. Some pupils have a particular aptitude and at times we are barely a step ahead of these pupils. In fact ,some of the solutions to problems come from these more technically-minded pupils which gives a huge boost to their self-esteem. But we also found that like the teachers, the pupils need regular ICT practice as the skills are easily forgotten. We operated a mentoring system in our classrooms, whereby 5th and 6th class pupils were taught the skills in small groups, and they in turn worked in pairs demonstrating the skill to a 4th or 3rd class pupil, often under the guidance of the classroom assistant. For this reason the classroom assistant's training was invaluable.

It was surprising how quickly the senior pupils became discerning in relation to appraising their own and the work of their peers and also how readily they took to the mentoring arrangement that we ourselves had benefited so much from using. Indeed due to the success of mentoring in the project, this strategy is now widely used in our classrooms for ICT work beyond that associated with the site.

Milestones

One of our proudest moments to date was the official launch of *Glenrath.com* in February 2000. Every effort was made to ensure the by this time each child had some piece of work appearing on the site. This became — and remains — one of our hallmarks.

The launch itself was held in a local hotel. We invited parents, our project partners, officials from NCTE, teachers from the other local schools and the local press to view our site. We used a data projector to project the site onto a screen and several short speeches were made. There were four

computers connected to the Internet and senior pupils from the two schools navigated through our site and through the ScoilNet site for our guests. We also had Terry Willers along to entertain us by drawing some of his unique cartoons, a number of which were based on the speeches. To culminate, refreshments were served. Our project partners were particularly impressed and commented that they were very pleased to be associated with such an excellent project. Parents in attendance were also generous in their comments and praise.

Such comments were gratifying because — unlike many other SIP projects — we were very much in the public eye from the outset — our mistakes and successes equally were there for all to see on the Internet! We had known this and had worked with this knowledge in the background. In a way it spurred us on to try harder and do better. But even so we did not anticipate the high-regard with which the site was viewed at its launch. Much to our delight these launch day comments were later echoed when we participated in a European IT Project Bazaar in Soest, Germany in October 2000. Our project received much favorable comment then also.

Remaining Challenges: The Rest of SIP and Beyond

We are now into the second year of our SIP project and the body of work on *Glenrath.com* is quite large. As the site grows, we have found it necessary to introduce certain technical restrictions to ensure a necessary consistency and style in what we do. Certain fonts and colours are now recommended for headings, a size limit set for images, and so on. But these things are probably part of the natural growth cycle of any such project.

We have recently had to address, for the first time, the challenge of bringing new staff on board. Presently we are training a new teacher in the use of *FrontPage* and *Photoshop*. So far this is proving possible totally from within our own resources and experiences.

We are also faced with the need to make more school-focused use of project release time. To date, we have not usually been able to use co-ordination days to allow release for Web site work — as these have been required for project administration and publicity events. This placed enormous pressure on the class teachers at times. However, during the current school year we will be better placed to use co-ordination days to release teachers for part of a day to work on the Web site.

On the technical side, our main aspiration this year is to organise some further training in the use of Adobe and in adding sound to our site.

Where field-trips are concerned we plan to continue using the approach developed with our SIP. Indeed, one of our classes just recently went to Clara Lara Funpark to survey its facilities for the site. Through SIP we have learnt the *real* value of going on field trips and of bringing visiting experts into our classrooms. The enthusiasm of the children and the level of their learning from these visits is very impressive — there is no substitute for hands-on experience. Carefully structured field trips ensure a high level of enjoyment, learning and understanding.

Another important lesson we have learnt from our SIP experiences is not to be over ambitious. In the balance, it is better to do something simply and well than to attempt something that is wholly unrealistic and to fail completely. For the remainder of the project and beyond, each class will cover one topic per term and we will only publish once each term, making sure to avoid rush times like Christmas and the run into summer.

As teachers, we are very happy with the Web site and feel that while the effort involved was huge and took up much of our personal time, the resulting work is something that has given the schools much to be proud of and considerable positive publicity. Numbers in both schools have increased — at least in part because of this publicity. Ironically, the resulting increase in enrolment has made our Web site work more difficult! We all feel that ICT work is more manageable where there are smaller class sizes. We also feel that the skills we have acquired transfer smoothly to other aspects of ICT (beyond the site) and computers are now used widely in our classrooms. However, we have noticed that it is more difficult now to work to our publication deadlines, perhaps because we are not as focused this year. Last year there was more of a challenge and this kept us highly motivated.

In any event, we all agree that the work for the project has been very successful and we are anxious to continue the Web site even after the SIP Project ends. Now that we have the equipment and the software, the principal cost of doing so will be the Web-hosting fee. Even if our current project partners cannot financially support us much longer, we should not have undue difficulties raising the amount.

Concluding Comment

Glenrath.com is, in the main, directed at children and the site is composed around topics which are on the primary school curriculum and are seasonal. Therefore we hope the site will be useful either to help with homework or as part of project work in school . It is our intention that the site will continue — long beyond the life of the project — as a children's resource — documenting the flora, fauna and history of our area for ourselves and for other schools.

But we have also been methodical about building a part of the site which allows a teacher or parent to access content and suggestions relating to past work on the site. This archive details which classes/age-groups the work is most suitable for and lets the visiting adult know if there are activities relating to the pages held elsewhere on the site, or indeed on other sites that we know of. It is our intention that this aspect of the site will also be maintained as well as possible, so that the site remains useful for teachers in their planning for the use of the Internet.

On reflection, we would suggest that other schools anywhere in Ireland or indeed the world could successfully undertake this kind of project. They would however need to approach it with some caution and probably be prepared to put in some considerable amount of 'out of school' time. They could usefully start with a thorough audit of their staff's computer skills and then plan the site very carefully — documenting in advance each class's possible contribution, and each teachers role. In terms of ICT equipment the school should have — at a minimum — a couple of hi-specification PCs or Macs (with appropriate word-processing and presentation packages installed), printers, a scanner, a digital camera, a Web design package and some image manipulation software. Assuming the teachers are computer literate, a three-day course in Web design and publishing is likely to provide the required skills to realise the site. Some degree of technical support would also be most necessary.

The benefits of such a project are enormous not only in the area of technology but across the whole curriculum. *Glenrath.com* truly is a teaching and a learning resource and building it truly has been an educational experience for all of us involved.

Developing Fluency: ICT in Irish and English Language Skills at Infant and Remedial Levels in Primary Schools

Daithí Ó Murchú

Introduction

Our project is entitled: *The Development of Oral and Aural Language Skills at Infant and Remedial Levels in Primary Schools, in both Irish and English, through the Medium of Full Multimedia Programmes and ICT, within the Guidelines of the Revised Irish Curriculum* (SIP 056).

The original idea for this project emerged largely unprompted from my experiences as principal of a Gaelscoil — an Irish-medium primary school — in regard to the areas of language usage and development. It has long been recognised that the Irish language, in particular, has failed to catch the imagination of students and teachers in our educational system. One could even go as far as saying that large numbers of students dislike having to study Irish because the methodology behind its teaching has failed to keep pace with modern trends. Indeed, this may also be true of the methodology behind the development of English language in many bilingual/multilingual settings.

Put simply, our project is intended to address these problems and to set about developing for both teachers and students, a potential blueprint for the development of language usage in both Irish and English at primary level. Allied with this is a belief that new teaching and learning technologies — particularly ICT — could be more fully utilised to enhance the learning and teaching involved.

The main focus of what we do in our SIP falls on those students whose language learning is at a disadvantage either because of age or learning difficulties. This was a conscious decision. We chose to concentrate on the infant classes and on students throughout the school who were attending learning support because we believed that these groups were experiencing problems with language usage through no fault of their own. This has proven to be a good decision, and indeed has been a major influence in the direction we are taking and the work we are doing.

Background

Within the guidelines of the recently published Revised Irish Curriculum, particularly in the areas of the development of the Irish and English languages, it is proposed that teachers should embrace a new perspective in how and why we set about teaching language skills. We are encouraged to set about:

> "Promoting positive attitudes and developing an appreciation of the value of language — creating, fostering and maintaining the child's interest in expression and communication — developing confidence and competence in listening, speaking, reading and writing — enhancing emotional, imaginative and aesthetic development through oral reading and writing experiences".

> (Curaclam na Bunscoile, NCCA, 1999. English Language. pp. 10-12; Curaclam na Bunscoile, Gaeilge, Teanga. pp. 14-15).

Our project team would endorse these sentiments without reservation and in our work, we have concentrated on interpreting these curricular guidelines in a very direct sense — by making language learning fun.

We believed that through the identification of key words in the Irish and English languages, and the integration of these into a thematic visual arts programme — drama — we could encourage children to develop confidence and competence in language usage. Not alone that, but by encouraging the use of ICT (digital cameras, scanners, video cameras and multimedia programmes) within this programme, we would provide for children, in the project settings, a multitude of engaging learning experiences which would lead them systematically along the path of language acquisition. Increased familiarisation with the use of technology as a learning tool would be an integral and positive aspect of this process.

As instigator of the whole idea, it fell to me to canvass support for the idea and to persuade teaching colleagues from a number of schools to take up the challenge and opportunity of being a part of this SIP. The choice of project schools was therefore a matter of balance and judgement. The project needed to encompass the diversity of both language and location — though for reasons of easier implementation needed also to rest within the Counties of Limerick, Cork and Kerry. To ensure that the work we did was applicable across a broad range of social settings and contexts, we needed to work with students from rural and urban backgrounds. In all, six other schools (three Gaelscoileanna and three National schools) took up the challenge. This ensured a good mix of participants across a wide spectrum of school settings and contexts. We are confident, therefore, that what we are doing will be widely relevant to schools in Ireland when it comes to the development of oral and aural language skills in Irish and English within the guidelines of the Revised Curriculum.

The extent to which we intended to make use of ICT within our project led to an early decision to seek a reliable and understanding business partner who would help ensure that problems arising in these areas would be rectified quickly and at little or no cost. Micro Ireland, a Limerick-based company became our partners in this regard. Two other partner organisations also came on board: Mary Immaculate College, Limerick — to help ensure the academic validity of the project by providing expertise in assessing our work, and Limerick Education Centre, who assisted the project in a variety of ways from the outset of our work. We find that these partnerships work very well and help greatly with the running of the project from a technical and academic perspective.

Progress to Date

There have been a number of significant milestones and moments in our project to date.

One which particularly springs to mind would be the compilation of the project's key word registers which are now used extensively in the development of Irish and English language skills within the project schools. We examined the Dolch lists of words from a learning support perspective, and in consultation with our staffs and other educationalists, then supplemented these lists to include more modern words. We then divided these supplemented lists and words into both class and age groups. From the perspective of Irish, we started with the work done in the early 1960s in the identification of the key words in the spoken language and once again, following a similar pattern to that already practised on the Dolch listings, we compiled and supplemented a comprehensive list of the key words. The project schools and a number of others, external to the project, verified the appropriateness to age and class grouping of these lists. Subsequently, their feedback allowed us to consolidate our lists of words for the project.

Our work on key lists led to the development of the next stage of the work. We were now in a very secure position to design a full and inclusive, whole-school programme in drama which incorporated our listings in a meaningful and generative way. This programme encompassed the various levels already identified in the word lists and allowed us to introduce language learning that was both novel and fun. Language activities — in both Irish and English — were drawn up around eight themes which the students themselves had chosen. These were:

Class	Theme
Junior Infants	Our homes and families/Ár dtithe agus ár dteaghlaigh
Senior Infants	People in our community/Daoine in ár bPobal
First Class	Nature all around us/An Nádúr, thart timpeall orainn
Second Class	Our school /Ár scoil
Third Class	Lots to do/Rudaí le déanamh
Fourth Class	Customs and traditions/Custaim agus Traidisiún
Fifth Class	Local history/Stair in ár dtimpeall
Sixth Class	Local industry and commerce/Domhan áitiúil tionscail agus gnólachtaí

Table 2: Drama Programme Themes, SIP 056.

In essence, our students often started work by going out into their local environment to research these various themes — to take digital images, to interview, to observe, and so on. On returning to the classroom, they were then able to build storylines around these activities (drawing heavily on our word lists) and then develop and present them in the drama class. We hoped that the children would also, in time, transform their thoughts and their experiences into computer-generated, multimedia presentations which would help others in their school and beyond in their work on creative language development. *Microsoft PowerPoint* provides an ideal medium for this.

From the outset, the Infant and the learning support teachers in all the project schools found our word lists to be very useful in helping children to develop their language skills. In the Infant classes, the teachers were able to introduce these words in a phased manner using the drama programme as the medium of expression. In the learning support classes — having already been introduced to the words in their drama programme — the children were encouraged to use the various word lists in a more formal and focused manner. Certain words were chosen each day and the children were encouraged to use them in as many and varied ways as possible. The themes mentioned above were always utilised to help the children to focus on the possibilities of word usage. The ability and age range of the children in question varied greatly, so this actually proved a challenging task. But by working in small group situations, the teachers were able to elicit usage from the children without them being under too much pressure. This proved to be very effective and enjoyable. Indeed, the class teachers of the students who were attending learning support soon began to notice that the children were very positive about participation, when they themselves were developing the various themes in class.

At present, all of the project schools are involved in creating various *PowerPoint* presentations which encapsulate their students' responses to the themes. This is being helped through the provision of templates designed by the project lead school (in consultation with our partners). We expect that these templates will add a degree of continuity and cohesion to the work across the schools and so make it easier for other schools, outside the project, to recognise the various strands and hopefully adopt and adapt the programmes to their own situations. Another advantage of *PowerPoint* is that it allows our multimedia presentations to be easily adapted for viewing on — and downloading from — the Web.

Challenges Met

As the old saying goes: 'Is fada an bhóthar gan casadh — It is a long road, which has no turns' and the development of our project has not been without its problems. For example, one of the original schools had to withdraw from the project because of unforeseen problems, and changes of staff members within other schools caused a certain amount of discontinuity in the development of the training and technological aspects of the project. We have, to date, always found our way around these — it just meant working that bit harder to do so.

The most formidable challenge that we had to meet was probably the fact that — at the outset — most of the partner schools had not experienced any formal training in the use of ICT. Multimedia presentations therefore, presented a significant challenge particularly given our intention to integrate ICT so fully into the work. A detailed, logical and sequential programme had to be designed to ensure that each participant teacher was equipped with the necessary skills to implement and develop these themes. The provision of substitute cover by the NCTE and the Department of Education and Science greatly facilitated the implementation of this training programme (and the project in general). While it must be recognised that, even now, not every staff member of every project school is technically able to participate fully in the work of the project, it must also be said that we all support the project and seek to enhance our students' language acquisition by applying its principles.

The range in size of project schools — from small rural schools to large urban schools — also raised a number of issues. For instance, it was at times more difficult for the smaller schools to find time to implement the project. This was due to shared learning support teachers and multiple class groupings being taught by the same teacher. But size could also work the other way. In some cases — particularly as we grew in confidence in what we were doing — small school size was an advantage, as older children were able to mentor younger children. In these cases, peer-to-peer 'teaching' was found to be very effective, and the class teacher was afforded the time to be a more creative support to the work in progress.

In summary, what we have achieved so far has been the product of many hours of research, evaluation, implementation, assessment, re-design and re-implementation of the various strands of the project. We cannot say that our project encompassed all of these various strands from the outset, or that progress has been uniform across the project schools. Nor indeed can we say that we even expected our project to subsume such a range of activities and possibilities. That said, we are certain that we have progressed, and that each stage we have been through was necessary to ensure the overall success of our work. The development of language is undoubtedly a very complicated and exacting art.

Project Impacts on Teaching and Learning

Our project is impacting in a number of significant ways:

Firstly, it has caught the imagination of the parents in our schools. As a result they willingly offer their help with its implementation. This varies from studying various words and themes with the children, to providing advice on implementing the themes of the project. With this comes a sense of true partnership in education — teachers, students, parents and other partners working together as a team to the benefit of all.

Second, the manner in which we have set about achieving the aims and objectives of the Revised Curriculum, with reference to the development of language skills, is undoubtedly one of the major impacts of our project. There is a certain flexibility built into our materials. The teachers are presented with well-constructed exemplars which allowed for as much or as little creativity as they wished to input, in both the development of the Irish and English language programmes. Furthermore, the use of technology has become a natural ally in designing programmes which are student-centred and student-driven and therefore of more interest and value to our pupils. We, as teachers, may have chosen the themes, but we have seen the students adapt them, using the word lists in ways that mean both the academic requirements of the Revised Curriculum and the fun aspects of language learning have been successfully fused.

A third impact can be seen in the way that many of the children receiving learning support now develop their own personal language learning activities using words from the project lists which they themselves feel most comfortable with. This we believe is one of the major, unforeseen successes of the project. The Infants, on the other hand, may need a lot more assistance in targeting language for acquisition, but they greatly enjoyed looking at their work and hearing their voices on the computers.

Our work also introduced a new element to homework which supports language development. A considerable number of parents are now able to view their children's work on computers at home. This, we have found, leads to discussion and therefore enhances learning by complementing the work being done in the schools.

Another major but unexpected impact of our project, has been the demand among schools outside our project for access to the word lists, the drama programmes, and the presentations which we are designing. Put simply, our project addressed language teaching methodology in a novel manner and so the possibilities for using our approach in the teaching of minority languages and other major European languages, was quickly recognised. For instance, some of the student teachers who had placements in project schools were impressed enough to use our approach and materials at other schools around the country on subsequent placements. This led to the rather interesting situation where these schools began contacting us looking for more, in some cases for our 'finished product'! This is gratifying interest indeed, which in time we hope to meet.

In brief, there is no doubt in our minds that this project raises incredible possibilities and has far-reaching implications for the development of language skills in early years children and those receiving learning support — and not only in Ireland but also beyond. The templates and programmes which we have designed could be taken as they are and would allow schools to implement a comprehensive programme of language development. But we would hope that schools would instead look upon them as exemplars and design their own thematic work and multimedia presentations around the ideas and the methodology they contain. In that way what we are doing would be a source of *inspiration* as well as ideas.

The most significant remaining challenge for us is to finalise the materials and student presentations associated with each theme, and to find a way to provide all those who have expressed an interest in what we are doing with a detailed and comprehensive package of our work to date. To do this it will be necessary to develop a very significant presence for our project and/or to make available CD-ROMs and booklets outlining the aims and objectives, word lists, activity and presentation templates, and so on. This would allow our SIP to be emulated and further developed in other schools.

A considerable further investment of both time and money would be needed to achieve this, but the end results would be tangible and, we strongly believe, well worth it for all concerned.

Closing Comment

As stated at the outset, our project is concerned with language, its usage and its acquisition in the early years and through learning support. Our project also continues to show us that this is a very complex and challenging area of the Revised Curriculum.

In essence, the major contribution of our project to our understanding of the place of ICT in the process of education is that they should not be mutually exclusive. Furthermore, young children are well able to approach the challenges of the technological world. They are like natural sponges, absorbing languages at deeper levels through body and mind — the Montessori methodology of sensory learning — and through the medium of a more traditional curricular area — drama.

Our project would also affirm the capability, creativity and professionalism of Irish teachers. When presented with a curricular framework for the development of language skills, we were able to

integrate our understandings of teaching and learning with the tools of the new technology. This allowed us to produce exemplars in the development of language usage which could be emulated by any school willing to invest the time and effort required. All of which leads me to believe that our project will continue to develop after SIP has been concluded and — more importantly — be emulated and replicated in other local, national, and international settings.

From small acorns grow great oak trees. We would look upon our project from the point of view of the well-planted acorn and hope — with a considerable measure of confidence — that our own future work in the area, as well as the participation of other schools and organisations, will continue to nurture it.

Acknowledgements

To all of our sponsors, we in the project give heartfelt thanks, as our work would not have reached its present state without their technical, personal and corporate advice, their support, and their belief in what we are doing and its potential. We take off our hats to the NCTE and the Department of Education and Science for their support and encouragement in the development of our SIP and to all the schools, the students, parents, and boards of management involved. We wish to acknowledge the professionalism and the dedication of all the classroom teachers who contributed to this project. To the learning support teachers, we wish to give particular recognition, as they are often the unappreciated and forgotten heroes of our educational system. To my fellow principals and project co-ordinators and designers within the schools, Deirdre Dillane, Jack O'Connor, Jer Kirby, Donall Ó hAineafáin, Cathal Ó Riarda, Nóríde Uí Mhurchú and Máire, I wish to express my debt of gratitude for your energy, your excellence and your hunger for knowledge. Gabhaim buíochas ó chroí libh uile 'is bhí sé mar onóir dom comhoibriú libh le linn saoil an tionscnaimh nuálach seo.

Appendix

Participating Schools

- Gaelscoil Ó Doghair, Newcastle West, County Limerick (Lead School)
- Duagh N.S., Listowel, Co. Kerry
- Templeglantine N.S., Templeglantine, Co. Limerick
- Raheenagh N.S., Raheenagh, Co. Limerick
- Gaelscoil Thomás Dhaibhís, Mallow, Co. Cork
- Gaelscoil Sáirséal, Sr. An Droichid, Limerick City

Setanta: A School's Intranet Project

Ray O'Neill

Introduction

The introduction of information and communications technologies (ICT) to post primary schools in Ireland has been somewhat haphazard until recently. Schools have had little support in the form of policy or strategies for the introduction of ICT or by way of resources to bring ICT into their day-to-day practice. In the absence of coherent national initiatives, the local has had to suffice — and so, many post primary schools have set about obtaining hardware and software from within their own resources and devising approaches and strategies for the introduction of ICT to their school.

Then came indications that all this was about to change.

On 28th November 1997 the *Schools IT 2000* initiative was launched in St. Aidan's CBS, Dublin by An Taoiseach, Bertie Ahern TD and the Minister for Education and Science, Michéal Martin TD in the presence of Alfie Kane, Chief Executive of Telecom Éireann (now Eircom).

At that launch, An Taoiseach said

'We want every school in the country to achieve computer literacy.'

In his turn the Minister said:

'Ireland lags significantly behind its European Partners in the integration of information technologies in our schools.'

and

'Helping teachers to develop the skills necessary to use information technologies has been shown throughout the world as being the key to successfully introducing them in the classroom.'

In response to these challenges St. Aidan's began developing a school plan for ICT in January 1998. A number of key factors were identified:

- To date, computers have been used in schools to teach computing. However, the primary occupation of schools is teaching subjects and ICT is not one of these subjects. It appears that ICT is peripheral to most teachers.
- Commercially available software (courseware) is generally not adapted to the Irish market and as a result is not particularly useful.

From the start the Internet was an integral part of our thinking. However, while it provides a useful metaphor for teaching subject areas, it has its own problems. For instance, content appropriate to the teaching and learning context in this country is often difficult to find, so we are dependent on what others make available on the Internet. In addition, access speed is a problem and will continue to be until broadband technologies are rolled out and costed appropriately for school usage.

The Context of ICT Change

At a 1998 Teachers' Conference here in Dublin, Tom O'Dwyer, Director-General for Education, Training and Youth, at the European Commission delivered the keynote speech. In his address, he referred to numerous studies which showed the educational benefits of ICT, and then outlined the recognised obstacles to the use of educational multimedia in schools. They were:

- a lack of user-friendly multimedia equipment and software for teachers and pupils,
- insufficient quantities of equipment, with what exists often being technically obsolete, insufficiently used and rarely connected to a telecommunications network,
- insufficient quality and quantity of educational software adapted to the needs of users,
- difficulty in integrating educational multimedia into teachers' educational practice,
- a lack of teacher training and information.

The *Setanta* project was developed specifically to address these challenges in the context of our school's desire to maximise the opportunity on offer through *Schools IT 2000*, and particularly through the Schools Integration Project (SIP) element of this. We set out to plan and develop an intranet which would allow us to build and share teaching and learning materials right across the school.

The *Setanta* Edge

The *Setanta* Project — *Schools, Education, Teaching and Technology Applications* (SIP 042), centres on a unique partnership between St. Aidan's CBS and the School of Computer Applications, at Dublin City University (DCU). It draws on the skills, teaching interests and needs of the students and staff of St. Aidan's school and merges these with the expertise, research interests and needs of the staff and students at Dublin City University School of Computer Applications. This means the project has access to the multimedia skills of staff and technologies available in the School of Computer Applications, as well as the programming and development skills of its undergraduate students. These are judiciously combined with the pedagogic and curriculum knowledge of St. Aidan's teachers to meet: the needs of St. Aidan's School for real, usable applications of ICT involving the Internet in teaching; and the needs of DCU Computer Applications for 'real world' projects for its undergraduates. Essentially the *Setanta* Project uses the strengths of both institutions to meet our various needs. In brief:

- The School of Computer Applications DCU has skills, experience and research interests in the areas of Multimedia, Internet and Intranet technologies.
- Undergraduate students in Computer Applications are required to complete projects, and the increasing number of students means a growing demand for project opportunities. The projects, in this proposal, have the advantage of being 'real' and focused.
- St. Aidan's has a long record in innovating, promoting and developing technologies in post-primary education.
- St. Aidan's teaching staff has strong pedagogic and curriculum experience.
- St. Aidan's needs advanced multimedia, Internet and intranet support and advice to continue its innovation.
- The concept of a subject-based intranet meets the requirements of relevant and interesting course materials, with the advantages of no dial-up costs and high-speed access.

Project Goals

With all of the above ideas in mind, specific projects goals were identified. These were:

- to develop a model for a school-based intranet to support the teaching of second level school subjects,
- to include in this model, a description of the necessary hardware, software and human resources required to implement a system,
- to use the model in school and evaluate its strengths and weaknesses,

- to make the technology available to other schools.

Project Objectives

Goals such as these are at their best when they help with useful and realisable objectives. We quickly found that project objectives followed quickly and naturally from our goals. These objectives may best be understood in the following terms. The *Setanta* project sought:

- to increase the proficiency of a cross section of teachers in the use of PCs and the intranet, not just in terms of general ICT skills, but specifically related to their subjects,
- to establish an intranet of course materials,
- to make this intranet available in a classroom, facilitating fast access and tailored to the needs of the school and curriculum,
- to extend this intranet to include a range of subject classrooms.

Project Activities

Project activities may be summarised under the following headings:

- staff training in the use of the intranet and in the development of courseware,
- enlisting the expertise of DCU's School of Computer Applications in the reconfiguration of our existing network to facilitate the operation of a secure intranet,
- upgrading existing Internet access,
- devising content projects to meet the needs of St. Aidan's for appropriate courseware which will also be suitable as final year projects for Computer Applications students,
- enlisting the expertise of DCU's School of Computer Applications in developing courseware.

Developments to Date

There have been considerable developments to date across a number of strands of the project. These are outlined in some detail at Appendix 1 but can be summarised as follows:

A variety of training courses has taken place involving teachers and students. These cover both hardware and software aspects of the project and range from basic ICT skills to Web design, and include work on mobile computing in the classroom.

The first two stages of our hardware and software upgrade and reconfiguration programme have been completed. This includes the provision of PCs at key points about the school (staff room, careers areas), the reconfiguration and re-cabling of our existing network, and the purchase of key ICT peripherals (mainly data projectors and digital cameras) and the purchase of laptops for use in mobile units with the projectors. Dates have also been fixed for the next phase of our development.

In his address to the *Third European Conference on ICT in the Curriculum,* David Katz (3Com Director, Global Education Markets) highlighted a number of key factors required for a successful ICT project — one was the development of specific content by students themselves.

We saw this as an attractive and feasible proposition for development within the framework of the *Setanta* project. Consequently, a group of 20 students from St. Aidan's became participant-contributors in the project. Following training they have been involved in developing content for the intranet and maintaining the network. Participant-contributor training includes training in: Web authoring, in setting up laptops, data projectors and connecting to the network, in organising task groups to carry out particular functions relating to intranet maintenance and development. We believe that this will greatly empower the students involved in using ICT, increase their understanding of the technological world they live in and encourage their future participation in technological developments.

Content development has therefore played a central part in our project's work to date. St. Aidan's participant-contributor students have (under supervision) now completed the major site-build associated with Setanta. Five members of St. Aidan's staff — assisted by six students — are currently at work on specific site content for RE, History, Science and Geography. In addition, work on a virtual art gallery has been completed by two members of staff at DCU Computer Applications, and two of their students.

Highlights

On Friday 19th May 2000, St. Aidan's CBS in partnership with the School of Computer Applications at Dublin City University and the National Centre for Technology in Education presented the *Setanta* intranet project to its students their parents.

On the day there were presentations of *Setanta*, which uses an Internet metaphor to provide teaching materials to students in the school. The materials included our virtual art gallery and support materials for teaching Art along with an interactive Web on Science topics. The art gallery allows the viewer to walk around rooms within the gallery and view the paintings on display. It also includes audio which is used to give the background to the painting and in some cases video-clips which represent a more satisfactory way of viewing sculpture.

But is that what it is really all about?

Certainly it is heartening to be in a position to make public the successful outcome of so much work. To have built a robust and effective intranet and to help our students and staff grow in technical ability in the timescale that we have done is no small achievement.

However, the highpoints must also include all those small but significant moments that make a difference to how teaching and learning happens at St. Aidan's. For example, one member of St. Aidan's staff took up emailing so that he could stay in contact with his son who is backpacking in South America. He is now developing content for teaching Geography and junior Science. Another — a teacher of Irish whose own skills in IT are limited — had a difficult class for Irish. She took them to the computer room to write their postcards in Irish. After a couple of weeks she commented. "They know more Irish than I realised. The problem was I couldn't read their handwriting. When I thought they were wrong they were really right!"

Late in 1998, the first of two computers was made available in the staff room for teacher use. This was another small but important development — it helped provide an IT environment in the staff room. Our teachers could now see IT in use. Comments were soon heard like: 'If that eejit can use them so can I.' But on a more serious level the staff were being exposed to intuitive IT. They began to see possibilities that they had never considered, and they began to support and help each other. In time, more teachers began to use less obviously technical aspects of IT like digital cameras, scanning, video-conferencing. All of this helped make ICT an ordinary part of everyday life in the school. Staff and students were becoming used to an environment where these tools were ever-present. Technology became familiar and easy to use.

In a very real sense this project is about changing the culture of a school. Frequently in schools technology can only be accessed with difficulty. Instead of making it difficult for teachers to access and use technology, we have to try to make it difficult for them not to.

Equitable and Effective Access

Technology can have a liberating and transformative influence in schools, but these transformations require equitable and effective access. We have been very conscious of that within the *Setanta* project. A good sense of what we are trying to do is caught in the words of Jones, Valdez, Nowakowski, and Rasmussen (1994) who are worth quoting at length here. They describe four

indicators — connectivity, ubiquity, interconnectivity, and equity — that they suggest denote equitable and effective access to technology:

- Connectivity: "Connectivity refers to the technology's ability to access rich resources within and beyond the school because it is connected to those resources. Connections between a school and a telecommunications source must be in place if the school is to benefit from the wealth of free and low-cost resources on the information highway." (p. 14)

- Ubiquity: "In terms of ubiquity, the ideal situation would be for all students to have their own networked computer. Since that probably won't be the case anytime in the near future, technology is considered ubiquitous when computer, printer, media technologies, and other equipment are easily and readily available to teachers and students for problem solving, communication, collaboration, and data exchange. Simply having a computer or multimedia lab in every school is not ubiquitous, because students and teachers have to physically go somewhere and perhaps wait for some length of time before they can use the equipment. Networks of computers and other equipment — especially printers — throughout the school indicate high technology performance." (pp. 14, 16)

- Interconnectivity: "Interconnectivity occurs when students and teachers communicate and collaborate in diverse ways (exchanging data in different formats and publishing, for example) using technology." (p. 16)

- Equity: "For a school to be connected and interconnected, and for its technology to be ubiquitous, means that everyone has access to the best and most extensive resources the technology has to offer. If a system has home-school connections but no connections to the local library system or to the Internet, or if only students in gifted classes or in magnet schools know how to use those connections effectively, the technology is not being used equitably. Technology in schools should be available to all students so that everyone has access to rich and challenging learning opportunities." (p. 16)

We like to think that the *Setanta* experience has reflected a genuine concern for these principles, and significant practical progress towards achieving them within the work that we do at St. Aidan's.

Comment

The *Setanta* Project — *Schools, Education, Teaching and Technology Applications* (SIP 042), is still at an early stage. Current indications are that significant steps have been made toward integrating technology into the life of our school. It is certainly true that much of this progress has been achieved by empowering teachers around technology and enabling teachers to empower their students, through their own use of technology, within their own subject areas.

At the start of this project there were six teachers within the school that used ICT in some way during the school day. There are now only two teachers who do not.

We have gone some way to meeting the Minister's objective of 'Helping teachers to develop the skills necessary to use information technologies' so they can 'introduce them in the classroom' and, there is more to come.

Reference

Jones, B.F., Valdez, G., Nowakowski, J., and Rasmussen, C. (1995). *Plugging In: Choosing and Using Educational Technology.* Washington, DC: Council for Educational Development and Research, and North Central Regional Educational Laboratory. Available online: http://www.ncrel.org/sdrs/edtalk/toc.htm

Appendix

Training Courses to Date:

Course	Date	Participants
Basic Computer Skills	May 1999	12 teachers
PowerPoint	January 2000	5 teachers
Set-up and Use of Data Projector and Laptop	January 2000	10 teachers
Computer Applications	February 2000	21 teachers
Web Design	April 2000	14 students, 4 teachers
Set-up and Use of Data Projector and Laptop	October 2000	7 teachers
PowerPoint and FrontPage	November 2000	16 teachers
FrontPage	November 2000	48 students

Content Development

St. Aidan's

Development of Web site by students	25 students	Complete
Science site	1 teacher, 3 students	In development
Geography site	1 teacher, 3 students	In development
Religion site	1 teacher	In development
History site	2 teachers	In development

School of Computer Applications

Development of virtual art gallery	2 staff, 2 students	Complete

Current Work:

St. Aidan's

Development of additional subject content: RE Web, Geography Web, History Web, Science Web	In progress
Training in Web design and development for St. Aidan's students	Complete
Public presentation of the project, May 2000	Complete

Infrastructure:

Phase 1			Cost	Sponsor
Re-cable existing network	October 1999	Complete	£13,000	St. Aidan's
Upgrade network server	October 1999	Complete		
Reconfigure network to provide robust, secure access	October 1999	Complete		
Provide email/Internet access to computer room, staff room and main office	October 1999	Complete		
Two computers in the staff room	September 1999	Complete	£3,200	St. Aidan's
Data projectors (2)	January 2000	Complete	£6,400	SIP
Laptop (to use with data projectors)	January 2000	Complete	£1,803	SIP
Digital video camera	January 2000	Complete	£1,600	SIP
Digital still camera	September 2000	Complete	£1,100	St. Aidan's
Computer for Careers office	September 1999	Complete	£1,400	Tesco
Computer for Careers room	March 2000	Complete	£1,500	NCTE-Careers
Phase 2				
Cable every classroom in the school to provide access to the school network, intranet, Internet and email	April 2000	Complete	£8,500	St. Aidan's
Install courseware, video-conferencing software and hardware for use across Internet	February 2000	Complete	£2,500	St. Aidan's
Computers to two Science rooms	October 2000	Complete	£2,700	DES Science grant
Computer for Music room	September 2000	Complete	£1,200	Tesco
Provide second computer room	December 2000	In progress	£14,000	St. Aidan's
Provide computers to 12 classrooms	December 2000	In progress	£14,000	SIP

Comparative Social History: *Revisiting the 1937 Folklore Survey*

Síle O'Sullivan

Background

In 1937 at the request of Eamon De Valera, all senior National School pupils (i.e., fifth, sixth and seventh class pupils) in the country were invited to take part in a *National Folklore Survey*. This gave the participating pupils the chance to research and record their life and times. A valuable archive was assembled by the schools covering local customs, songs, games, piseogs and other superstitions, ruins, historical sites, and so on. This was documented in the pupils' own beautiful handwriting and presented to local libraries where it is preserved and available on micro-film.

Nothing similar has been attempted since on such a scale. We at Coachford National School, in Co Cork are lucky enough to live at the heart of an area rich in local culture and heritage. We decided that it could be very worthwhile educationally to revisit the survey returns for our local area — which was possible because the national survey was essentially a constellation of local projects — in order to compare our lives and times to those of the children living hereabouts sixty years or so ago. The only major difference in what we intended to do was that where they had used penmanship to document their world, we would make use of ICT as appropriate to document ours.

The result was an exciting and engaging educational adventure which has taken us all — teachers and pupils alike — to places we might otherwise never have been!

It was decided from the beginning that our project would be a whole school initiative. This meant that all seven teachers — six class teachers and the learning support teacher (shared) and all 146 pupils, from Junior Infants to Sixth Class — would participate. Parents, grandparents, local businesses, local farmers, Coachford Historical Society and the County Library would all be approached to provide the information and resource materials for the project.

Obviously to be considered a suitable proposal for inclusion in the newly-announced Schools Integration Project (SIP), we would find it necessary to place IT at the centre of the whole thing. But at the pre-application stage — while we suspected that IT would help/enhance the project — we weren't sure how!

In retrospect this was actually a useful position to be in: it meant that what we went on to learn and to do we did for a particular purpose — to find and use appropriate ICT as tools with which, and through which, to learn, rather than simply trying to find uses for the technology purely for its own sake.

Aims and Objectives

The aims of our comparative social history project were twofold:

- to instil and increase in our pupils an appreciation of the rich legacy bequeathed to us by our ancestors, as viewed by the children of yesterday and today,
- to enhance the children's understanding of the ever-changing and ever increasing use of Information and Communication Technology in our world.

The objectives of the project were:

- to foster and increase teamwork and collaboration among teachers and pupils in a whole-school situation and to enhance community/home/school links in the learning process,

- to provide opportunities for the pupils to engage in meaningful research, marrying traditional and modern methods,
- to provide a resource for future generations in the Coachford area.

Starting Out

The difficulty in the beginning was deciding where and how to start! There were many possible ways of approaching the project. As a staff we could not settle on any one — so a number of possibilities were teased through in those early days. Looking back, it is clear that one of the reasons for this was our not knowing exactly what we could do with ICT to produce or enhance the work of the project in any of its proposed forms.

We simply could not visualise how the project could be completed/presented using ICT.

However, we had to start somewhere so the project began by acquiring from the Cork County Library a copy of the work done by the 1937 pupils of Coachford National School (Clontéad National School as it was then). This was printed onto A3 paper from the microfilm and distributed among the teachers who studied the survey to identify what might be relevant for them and their pupils. This exercise proved useful. It gave some excellent headings for the work.

A series of meetings allowed us the opportunity to express interest in particular areas and to discuss the advantages and disadvantages of different age groups working with these areas.

Simultaneously, research was taking place into the hardware that our project would most likely need — its nature, its cost and purchase arrangements. As the project began to take shape, it became clear that our equipment needs centred around what we would require to compile and publish digitally the findings of the children's research. Through SIP we acquired a dedicated hi-specification computer, a laptop, three printers, a scanner, a digital camera, a CD-writer and a camcorder. This brought the total equipment in the school to six computers and six printers — a key figure as it meant it was now possible to have one computer and printer per classroom. The remaining equipment would 'migrate' as required around the school.

Training

Training was to play a major part in the early stages of the project. At the outset, our IT skills extended no further than word-processing and some minimal knowledge of the Internet. Luckily, we did have enough basic ICT knowledge to be able to identify the sort and level of further training that we needed.

In August 1999 we organised a one-week NCTE Phase 2 Course in IT in Coachford Community College. This course was completed by all of the five permanent teachers on the staff (along with fifteen other local teachers). Unfortunately, neither of our two part-time teachers could attend but were subsequently trained gradually by teachers on the fulltime staff and by Mr. Greene, a member of Coachford National School's ancillary staff.

Between December 1999 and February 2000, all staff members completed an eight week (2.5 hours weekly) course of training in multimedia authoring, including use of the scanner, digital camera, *PowerPoint* and *Microsoft Publisher*. Unfortunately, one of the temporary teachers who completed this training had to leave in February. This meant further training for her replacement by members of staff, but it was done.

Taken together, these courses provided the basic technical know-how and — more importantly — a strong sense of what was possible using ICT and the confidence for us to take the plunge. The project then began in earnest.

Project Areas

Eventually it was decided that the areas of research and the classes researching these would be as follows:

Area	Class
Farming	Sixth Class
Townlands and Historical Sites in the Coachford Area	Fifth Class and part of Fourth
Famous People from the Coachford Area — Living and Deceased	Third Class and part of Fourth
Coachford Village	Second Class and part of First
Education/School Life/Social Occasions	Junior and Senior Infants and part of First Class

Table 3: Areas of Study and Classes with Responsibility for Each.

Farming: Sixth Class

In the main, this area lent itself readily to a comparative study between what existed in 1937 and what exists today. Work in the area was completed under five main topic headings:

- Land Cultivation
- Dairying
- Pig Farming
- Care of Animals
- Crops

Each topic was studied by a group of pupils, typically 3 or 4, at least one of whom was from a farming background. To get a grasp on what happened in 1937, the pupils interviewed their grandparents, parents and older members of the local community. To enhance their research, they acquired photographs of old machinery from vintage collections in the area, and scanned photographs from various publications in the County Library.

A variety of approaches was used by those pupils looking into modern methods of farming: firstly, they sent out a survey questionnaire to each farmer in the locality and had 100% returns! Secondly, they visited a number of different types of farmers in the Coachford area — pig, dairy and tillage farmers. To maximise the value of these visits the pupils prepared questions in advance and also brought the camcorder to record what they could of the significant changes that the visit identified. For instance: new approaches to calving a cow, harvesting beet, milking cows, feeding pigs electronically, and so on. Pupils from a farming background in the class continued to do this throughout the farming year.

To further enhance the materials they gathered, the pupils visited the local mart and followed the procedure of selling an animal using the camcorder. This would readily compare with what used to happen at the fairs in the past.

Finally, a visit to the Agricultural Event of the Year — the National Ploughing Championships in Castletownroche — proved very worthwhile and provided invaluable information and video footage on modern methods of land cultivation, different animals, dairying, machinery, new and vintage and so on. It also turned up a number of addresses from which further information could be accessed.

Local industries — *O'Donovan Engineering* and *Dairygold* — while initially not part of the sixth class brief, had to be included as they are integrally related to farming in Coachford today. Similarly, how being part of the European Union has changed farming also became a significant part of the project.

In the end, each of the Farming topics expanded to such an extent that any one of the five would have been enough in itself for a project! The Sixth Class produced eight very high quality booklets, with a wonderful blend of text and pictures, some of which were scanned in and others taken by the digital camera, on their topics. They also created a farming calendar.

These pupils were fortunate in that they had a zip drive attached to their computer and they could readily download their photographs onto a zip disk.

Townlands and Historical Sites in the Coachford Area: Fifth Class and Part of Fourth

Again, each child was part of a small group — on average three pupils — each of which had responsibility for their townland and a historical site. Their brief was to find as much information as possible about these from their families, neighbours, Historical Society etc. In the event, each group produced a considerable amount of high quality material — including maps, photographs and text — using Microsoft Word and PowerPoint.

Later in the year, it was realised that everyday life, as experienced by the older children was not being captured by any class, so it was decided that each child in this class would keep a diary for a week. A variety of entries resulted — factual, anecdotal, philosophical, and personal. A representative sample of these formed a class diary. These entries were enhanced by pupils scanning in their own photographs and signatures.

One of the highlights of the research into Townlands and Historical Sites was the bus trip to all the sites accompanied by local historian, Mr. Anthony Greene. This proved both enjoyable and highly informative for all concerned.

Famous People — Living and Deceased: Third Class and Part of Fourth

This class, again divided into small working groups, concentrated mainly on people rather than places, and each group produced a *PowerPoint* presentation on one of ten famous people from the Coachford area.

They sought information from the families and friends of these people. They also researched their subjects' work and scanned in samples of their work where this was relevant, as in the case of Mr. Michael Quane, the sculptor. He invited the class to his home, spoke to them about sculpture and showed them examples of his work. Ms. Catherine Lynch, the artist, from Coachford Village, provided the children with photographs of her work which they scanned. Some newspaper cuttings on Mr. Seánie Barrett, the national boxing champion from Rylane, and Ms. Lynn Dunlea the camogie all-star were also scanned, and both of these people gave interviews to the class.

Some deceased parishioners were, in their time, famous or notorious as the case may be. A number of these also drew the attention of children from the class:

Mr Micheál Ó Murchú was a famous Gaelic poet (An Gabha Gaelach) who began his life as a blacksmith and went on to become President of the Gaelic League. Mr. Herbert Gillman, a Coachford man became Finance Minister in Ceylon (under British rule) and introduced decimal currency there around 1870. Dr. Philip Cross, a local landlord who was executed in 1888 for allegedly killing his wife in order to marry his mistress proved a very interesting study. Dr. Richard Barter, known locally and to some of his medical rivals as the 'Water Quack' was ahead of his time in water therapy, and founded the famous 'St Anne's Hydro'. As well as presentations on their life and times, the pupils of this class also produced a calendar and name cards featuring these people.

Along with famous people, this class also took responsibility for researching 'The Muskerry Tram' — a narrow gauge railway which served Cork–Coachford from 1886 to 1938 — as it played a significant role in the life of the people at the time. Some of the work this topic turned up was among the most interesting and unexpected of the project.

Coachford Village Life: First and Second Class

The pupils researched this topic in many different ways and focused as much on village life — then and now — as on the village itself. For instance, the children made a model of the village as it was in 1937 and collected memorabilia from olden days e.g., an old razor, a washing board, a water jug and bowl, a chamber pot, a 1937 Evening Echo, old spectacles, two china doll's tea sets, a stone hot water bottle, and so on.

They also visited the local supermarket and took photographs of those foods that did not exist in the past. There are lots! Indeed, foods and how they are packaged and sold differently nowadays — tea, biscuits, sweets etc., were a source of great interest to the children, and the exercise produced a considerable amount of materials and information for our project.

This class also investigated two other much-changed features of village life — water and the significance of the village pump, and the importance of the bicycle as a means of travel in the past. Much of what they uncovered surprised and delighted them.

However, it was perhaps two interviews that children in this class conducted which brought them nearest to life in the late 1930s. The children interviewed 93-year old Mrs. O'Sullivan, who was sacristan in the church in 1937 and got all the details of life/practices — physical and social that have since changed regarding the church. The importance of the local creamery at the time was discovered through an interview with Mrs. Peggy Foley who was Office Clerk in the creamery in 1937, and the many changes that have since occurred were identified.

Life Long Ago and Life Today: Senior and Junior Infants and part of First Class

For information on life long ago, the pupils brought home questionnaires to their grandparents. This provided them with invaluable data on how their grandparents celebrated Halloween, Christmas and Easter. The children typed this information (printed, first, by class teacher as the children could not read their grandparents' script!) onto the computer. This, they compared to the way these occasions are celebrated today.

Another topic researched by the children was pastimes. Each child in turn brought home the school's digital camera and made lovely arrangements of their toys — for example 'The Barbie and Ken Collection' — and took photographs of these to add to the class collection. Games of long ago and modern day games were learned and recorded on video.

Food long ago was researched and compared with food today. Here, again, children recorded their findings on camera. One of the highlights was making brown bread and cocoa in school and then enjoying them in class afterwards. Photographing the various stages and writing up the recipe on the computer later made a wonderful *PowerPoint* presentation.

Each child brought in a picture of his/her family which was scanned in and details then typed in by pupils. Children in this class also took photographs of their homes and described them. They also described in detail their hobbies, pets and favourite television programmes. School life was captured by scanning in samples of the children's art work, class readers, Maths books, workbooks, and so on.

Should children of the year 2037 want to know how Coachford's younger citizens went about their daily lives in 1999–2000, they need only access this information for comprehensive coverage!

Finishing Up

For the last months of the school year 1999–2000, our concentration turned to cataloguing and presenting the vast amount of information the project had assembled in as attractive and accessible a way as possible. This was greatly helped by the availability of substitute cover under the SIP arrangements — a crucial feature of the project that could all too easily be overlooked.

Pupils prepared captions, edited *PowerPoint* presentations, and displayed examples of all of their work on the different walls of the six classrooms and the hall. Books were completed and each class designed a tee-shirt encapsulating the area of research that was undertaken by them. These tee-shirts were worn on the night of the presentation by individual pupils from each class, who gave a synopsis of the work completed by their classmates.

The parents, grandparents, local farmers, local community, local businesses, the Historical Society, NCTE representatives, Cork ICT Advisor and anybody who was in any way involved or interested in this project was invited to our Project Showcase on the evening of 15 June 2000. The response was staggering and the feedback on the night so positive that the Coachford Parents' Association requested that the school be opened at some future date, so that the people of the village could really study the work. This was duly arranged with parents willingly offering to host the guest night.

The Road Ahead

That should have been the end of it but of course in the way of these things, it was not!

On the night of the presentation, which we as teachers and our pupils had considered the completion of the project, Séamus Knox, National Co-ordinator of SIP, suggested that the work we had done deserved to reach a far wider audience. We should consider putting the project on-line.

We had not expected this and had no expertise in creating a Web site but after some consideration, we decided to take the challenge. One of our teachers agreed to undergo specialist training in the area and he will begin to work with the other members of staff once he has mastered what is involved. Right now, decisions are being made on what exactly we will put online. To aid the Web-build, we requested from NCTE that each class got its own external zip-drive — to ease the difficulty we had experienced concerning the efficient storage, retrieval and general management of the many photographs, *PowerPoint* presentations, files and folders in each class. This was all we felt we needed in terms of extra technological assistance.

Another of our aspirations is to put some of the project materials on CD and present it to the County and City Libraries. This would be our way of thanking them for the work they do (and of course for helping us in the early days of our project). It would also mean that they have a rather special resource for any children of future generations interested to know what life was like for their predecessors in Coachford National School!

Impact and Change

It is still too early to say definitively how participation in SIP has changed the teaching and learning that goes on in our school. This is for a number of reasons:

Firstly, as will be clear from the previous section, we are still involved in the project — though considerably less so than last year. Answering the question may be easier when we eventually fully wind-down our activities in this area.

Secondly, because of the time that was spent on the project last year, teachers are conscious of maybe in some ways compensating for areas of the curriculum that were put to one side for the duration of the project. For this reason, it often feels that we are not now always pursuing ICT at the level our expertise would allow. In a sense, the balance remains to be found.

That is not to say that there has been no change. There has — and at a fundamental level.

For instance, during our annual Book Week in December, all the pupils from one class produced elaborate book reviews using their class computer and other computers in the school. They worked in a way similar to the approach we had taken in SIP and the reviews were completed in record time with no reference to the organisational problems or level of skill involved. It was almost as if this was just the way we have always done things! What appears to have happened is that a period of accelerated learning has empowered teachers and pupils in unexpected ways, and not just in relation to ICT usage. Classroom management has changed. We have found that it is easier to think about trusting pupils with the presentation of their work using ICT. Pupils are very comfortable with IT, even when they do not know everything.

Although our 'training' for the information age — our SIP! — was at times exhausting, any project we begin now seems very attainable by comparison and low-key ICT usage just seems to creep in everywhere.

For example, children in first and second class are watching the changes throughout the year in an ancient Horse Chestnut tree in the school field, and recording these using a digital camera. The children are very excited about this exercise which in some ways reflects the work of the artist Claude Monet, whom they have recently studied. What is worth noting is that this now seems very basic to the teacher involved. But the same teacher, or indeed any teacher on our staff, would not have dreamt of this approach even twelve months ago. Recently I noticed another teacher who is involved in a paired writing project with parents using *PowerPoint* to make out her notes.

Within classwork, the use of IT for making of posters, Christmas cards, word-processing, scanning in pictures, *PowerPoint* presentations, classroom captions, and so on, also seems to happen more naturally now.

The Importance of being *Generative*

Maybe, at this stage it might be worth making the point that much of the teaching and learning that took place during the intensive researching and presenting of our project — can be attributed in no small way to the notion of the *generative topic* as proposed by Hetland (1997).

When topics are constantly dealt with in a shallow way, children's view of learning will be faulty. Blais (1988) makes the point that children often do not understand shallowness because they have not experienced depth. But generative topics are topics which are interesting, provocative, open, hold out the possibility of multi-connections, and are accessible through a number of resources and entry points. They demand depth.

Our SIP was over *generative*, if anything, and so required all of us to be selective in guiding the learner to the most promising, intriguing, informative and challenging areas of a topic. This, I think was done with great skill and success by the teachers of Coachford, as our pupils appeared to have been effectively engaged with the topic, resulting in mastery of the topic as opposed to coverage of the topic.

Such changes in how teachers teach may seem small and unimportant. However, I see these changes as hugely relevant in the professional development and self-esteem of teachers and subsequently in our pupils' learning. The experience of completing a SIP has confirmed this belief considerably.

Essentially schooling is concerned with teaching and learning through an organised curriculum. Implicit in the New Curriculum (Curriculum na Bunscoile, 1971) were five organising principles: full and harmonious development of the child, due allowance for individual differences, the use of activity methods, an integrated curriculum and environment based learning. The Review Body on the Primary Curriculum (1990) endorsed these principles and recommended that they should be

implicit in any future curriculum development. The White Paper in Education (1995) further endorsed them when it iterates:

> 'The principles of the Primary Curriculum emphasise child-centred learning through project work, guided discovery activities and group teaching. These principles form the basis of teaching methodology within the curriculum framework. . . '(p.27)

Coachford School's SIP — *Revisiting the 1937 Folklore Survey* — was rooted firmly in these principles. We set out to respond to the challenge of providing, in an authentically integrated way, for activity and discovery-based learning through the local environment of the child. We believe that our project has successfully done this and that its ICT aspect has been of considerable significance in this achievement.

In conclusion, I would only add that what we have done could be replicated anywhere — given the right equipment and the dedication of the teachers involved. But whether any staff in its right mind would knowingly undertake such a project is a different question! Our SIP did not so much evolve as snowball into a much bigger project than any of us contemplated! It moved from ICT to professional values by way of curriculum and challenged us deeply. We have enjoyed the trip but it is not one for the faint hearted.

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Kilkenny Information Age Schools SIP Initiative

Fiona Phelan

Introduction

The Kilkenny SIP initiative is a unique partnership between Kilkenny Information Age, NCTE (National Centre for Technology in Education) and the Kilkenny City Schools. Following Kilkenny's selection as an Information Age town, the task force of Kilkenny Information Age allocated a total of £300,000 from the £1,000,000 grant towards the development of ICT in the education sector. During 1999, NCTE, Kilkenny Information Age and teachers held many meetings to identify and select projects for their respective schools.

Our SIP includes eight projects in total, covering a wide range of subjects and topics and our main aim is that each of the projects will produce exemplars of good practice of integrating ICT into the curriculum. It is also envisaged that Kilkenny Schools will be positioned to the forefront of ICT development. Minister Micheál Martin, the then Minister for Education and Science visited Kilkenny in November 1999 to officially launch the projects.

NCTE is providing resources towards the employment of a full-time SIP Co-ordinator along with project support grants and teacher release time to each of the schools. I was appointed in January 2000 and have been working since in co-operation with Séamus Knox (National Co-ordinator, SIP) of NCTE and the schools in implementing the projects and in organising customised training courses for the teachers, under the guidance and support of Kilkenny Education Centre.

All 19 schools in Kilkenny are participating in this initiative. Each of the post-primary schools and the Mother of Fair Love School have separate and distinct projects that reflect the needs of their students. These projects constitute seven of the eight SIP strands. The eighth strand involves each primary school and the three special schools (13 schools in total) in a project called the Kilkenny Archival Project. All eight are up and running as of September 2000. However, the St. Kieran's College project is in its second year.

All eight project strands are now described -outlining their origins, basic aims, the successes and difficulties encountered so far, how teaching in the schools has changed as a result of SIP and, finally, the road ahead.

St. Kieran's College

Kilkenny — Then and Now

St. Kieran's College already had a computer room in their school when applying for a SIP. Other rooms were becoming available on the college campus due to the closure of the boarding school. The drama and technical studies teacher, Don O'Connor (Project Leader) saw an opportunity to use one of the larger rooms as a mini film studio. A plan was submitted in September 1999 for the Kilkenny Then and Now project. This multimedia project focused on the history of Kilkenny through its architectural and archaeological heritage. The idea of the project was presented to the students. Those who wanted to participate in the project used their Wednesday afternoon activities class. Subjects covered by the students included Music, Computer Studies Technical Drawing, Local History and English, and the result of their endeavours was a Web site, a printed publication, a CD and video.

The implementation team included Ger Buckley, Technical Studies Teacher, Tom Hogan, IT Co-ordinator, Fr. Eamon O'Gorman, Music Teacher and Nicky Cashin, History Teacher. However, it was not until January 2000 that the eight PCs and Apple 3Gs arrived and it was nearly Easter when the bulk of the software arrived. The team received training on filming techniques, film editing and on desktop publishing. One of the students in the group had Web design skills and designed the Web site for the project himself. It can be accessed at http://homepage.eircom.net/~stkierans. There were technical problems downloading the film from the video camera to the Apple G3 and then there were more issues removing the edited film from the Apple G3. Don O'Connor stated that "a little knowledge is a dangerous thing." The team were under immense pressure to complete the project due to the delivery delays and technical problems. A lot of time outside of school hours was invested in the project by both the team and the students. A factor adding to this pressure was the fact that the team felt that the Kilkenny Then and Now project had to finish with that current group of students, as the following year, a different set of students were going to be involved.

Two students, Mel Clohessy and Martin Green were so rigorous in tracking down the information they required, that they even had a question raised in the Dáil so that they could secure access to copies of original drawings of Kilkenny Castle.

> Don O'Connor, the Project Leader in summing up said that:
> 'When we were planning this project last September (1999) we never envisaged the amount that both we the teachers and the pupils would learn. The students have learned how to take photographs, draw technical drawings by hand and on computer, how to research a topic, how to interview, basic computer skills and advanced skills such as touching up photographs to editing a film. It has been truly amazing!'

Derek Collins, a student who has become adept at scanning and manipulating images said he 'had learned an awful lot this year from the project' and that it had given him an 'insight into working with computers'.

Some of the students have also uploaded to the project Web site, tips that they learned when optimising images for the Internet and for printed publications.

Such was the success of their project that SIP is now a timetabled optional subject for Transition Year students. The theme of this year's project is: The Duel at the Triangle, a drama production based on the life of Henry Flood, a Kilkenny man who was a member of Grattan's Parliament. This year's students will have the opportunity to learn ICT skills along with research, set design, acting, music, filming and film editing skills. The same implementation team are involved this year. Due to the success of last year's group, many 'non-IT' students have opted for SIP involvement, as they would like to see their names on the cover of a CD, as well as have a starring role in a film!

SIP in St. Kieran's stands for Student Integrated Project and the first crop of students coined this term. This is very indicative of how much they felt the project was theirs. The students work in groups researching their allocated topics or devising backing music for film. Students must visit local museums and libraries to research their topics. Visits to the local recording studio are also organised so that the students can see how a musical CD is produced. In fact, one of last year's students has gone on to start recording his own CD.

This project encompasses the fact that ICT is a tool that can be used to enhance the educational experiences of students. This project can be replicated nationally, the themes taken by the implementation team so far have been local but they could just as easily be international. The underlying requirements are a dedicated room, reliable equipment, extremely interested and motivated teaching team, specific training, local contacts, local technical backup, and so on.

Mother of Fair Love School

Open Integrated Learning Systems (OILS) — Software for Special Needs Students

Michael Brennan, the Project Leader and Peter Donohoe, the Principal originally submitted a SIP proposal to investigate the usefulness of a *Citrix* Metaframe network running *OILS* software across the school.

Due to unforeseen circumstances, the implementation of the project was severely delayed. In that time, Michael and the school were beginning to doubt the validity of installing the Citrix Metaframe across the school as the technical backup was not available locally and not all teachers were interested in ICT. It was decided to install a 10 PC NT network across two classrooms instead. Shelia Herlihy was asked to participate in the project simply because her room was next to Michael's. She was not an 'IT type', however, she teaches Senior 1 and Michael teaches Senior 2 and all the students using the software are between 13 and 16 years of age. The students have mild to severe learning difficulties.

The *OILS* software program allows students to learn numeracy and literacy skills at their own pace. As part of the project, the class teachers Michael Brennan, Project Leader and Shelia Herlihy are endeavouring to develop pedagogical strategies for using this software with special needs pupils. Both teachers have been given customised training from SiR, the providers of the *Global Mathematics* and *Global English* integrated software. Michael has received personalised training on the use of *NT 4* in his school.

Each student, in both classrooms, uses the software for approximately 20 minutes a day. There have been technical problems with the PCs, the network and the *SiR* software. Michael finds that some days he will spend more time sorting out IT problems in both his and Shelia's room, rather than focusing on the learning experiences of the students. Understandably, this has frustrated him greatly. Shelia, Michael and the students are at the beginning of a steep learning curve.

CBS Secondary School

Integrating ICT into the Teaching of Foreign Languages

When applying to participate in SIP, Br. Dan O'Keeffe — the IT Co-ordinator in Kilkenny CBS Secondary school, knew that his school did not have the space or the need for another computer room as a networked classroom already existed in the school. But he felt that concentrating on finding ways of incorporating ICT into the teaching of foreign languages could be of real benefit to the students and the school. Currently students and teachers are investigating the benefit of CD-ROM based French and German language software in a networked computer environment.

The implementation team in this school are in the main 'non-IT types'. It has been difficult to try to persuade teachers to bring Transition Year students into the computer room to use language software. The teachers lack confidence in the technical area and are daunted by the numbers of computers in the room and the potential for technical problems. The way around this has been for Br. O'Keeffe to explain the rules of the room and procedures for turning on and off the computers to the teachers concerned, and in addition, he will sit in on the first session with the teacher and if further assistance is needed he will be available. The teachers mainly bring in their smaller groups as they find the reduced number of students more manageable in the technical environment.

Another aspect to this project is collaborative email and video-conferencing projects with partner schools in France and Germany. In November 2000, Mary O'Leary, Cork IT Advisor, and Richard Galvin, St. Angela's Secondary School, Cork, organised through NCTE, a training programme for schools involved in video-conferencing projects. Br. Dan O'Keeffe, the CBS IT Co-ordinator and

Judith Scully, German Teacher attended this. The video-conferencing system installed in the CBS is in the Music room. The ISDN line has been extended to this room as it is directly below the Computer room. The Music room also has tiered seating, so it will be ideal for group conferences. The teachers using this video-conferencing system only need to know the ISDN number of the school they are contacting and how to use a remote control. This system was chosen for its user-friendliness.

All teachers involved in this project agree that they need to be prepared and confident before they embark on bringing students into the computer room or to use the video conferencing system and this is going to take time. However, the teachers are beginning to see the potential benefits that ICT can bring to their teaching.

Loreto Secondary School

Data Logging in Biology, Chemistry and Physics

The Loreto Secondary School, Kilkenny, also had a networked computer room when applications were being sought for SIP. The Science teachers in the school felt that data logging equipment in Biology, Chemistry and Physics would be of benefit to their teaching methodologies. This equipment could also be used for practical/experimental work in class and students would have the opportunity to use it in project work.

By Easter 2000, all the equipment and software was delivered to the school. The suppliers of the data logging equipment gave training sessions to the team. Helen Renehan the Project Leader, was in a position to allow some of her Transition Year and LCVP students to use the equipment prior to the summer break. In October, the Kilkenny/Carlow branch of the Irish Science Teachers Association organised an evening for schools undertaking data logging SIP projects, to disseminate their findings to date. Helen Renehan, Project Leader in the Loreto demonstrated how she uses the equipment to measure heart beat rates. Conor Goggin, Presentation College Cork showed how data logging could be used in Physics. Fergus O'Brien, Coláiste Muire, Cobh demonstrated how the equipment can be use to explain Charles Law and Boyles Law in Chemistry. Noel Clare from Our Lady's Cross and Passion in Kilcullen illustrated how data logging equipment can be used to record data on field trips and subsequently analysed in the lab.

As one teacher said, "if this equipment will help us to cover the course faster, it (data logging equipment) will be used." This is certainly proving to be the case when it comes to demonstration work. The results of an experiment can be simultaneously projected onto the board from the computer monitor and students can see the graphs being created as the experiment is being conducted. This allows the teacher the time in class to ask "what if" questions i.e., more time is available for the analysis rather than the recording of results.

In this school, there are two computers on trolleys that can be wheeled from the Chemistry to the Biology room or vice versa as the rooms are side by side. However, as the Science labs are already very congested, laptops would be a lot more convenient. The image of Science in secondary schools will be greatly enhanced by the use of technology such as data logging equipment. As the Department of Education and Science are providing funds for ICT in Science laboratories in schools, this project will continue into the future.

Presentation Secondary School

Integrating ICT into the Transition Year Programme

This school also already had a computer room prior to making its SIP application. However, there was a spare room that was big enough to be used both as a classroom and computer room. Jerry O'Dwyer, the I.T. Co-ordinator put forward a proposal to develop this room and give teachers from the Presentation Secondary school the opportunity to integrate ICT into their Transition Year Programme.

The project covers a wide range of subjects including Irish, English, Biology, French, Spanish, Religion, History and Geography and findings from this project will give an indication of the best way of incorporating ICT into a Transition Year programme. A Web site will be produced with lesson plans and tips for integrating ICT into the transition year programme. Pupils and teachers have been very enthusiastic in developing the various programs.

The project classroom has been designed so the teacher can integrate a traditional 'chalk and talk' class with ICT. Each subject is timetabled to use the room. Participation in the project has not been forced upon any teacher. However, as one teacher said 'using ICT is another way of tricking them (the pupils) into working.' Again some teachers were already confident in using ICT and had no difficulty integrating ICT into their own curricula. However, there are others who though willing, lack the skills and the confidence to do so effectively. Jerry O'Dwyer has provided training for these teachers once a week during lunchtime, and many are participating in the Intel Teach to the Future course. The teachers who have smaller classes are quicker to try out software packages and applications with their students. By Christmas, all Transition Year students had ICT skills as they were preparing for their ECDL exams. Teachers then did not have to teach the basics, they could concentrate on their subject area instead.

The main challenge now is to cater for the demand on the room. Even though the room is timetabled for each subject, not every teacher who is interested in using it can avail of it when they want.

The other issue in Transition Year, is the reality that though the whole class may be present today, due to a match, choir practice, a visiting speaker etc., the same number may not be present tomorrow. This can be difficult to manage or it can be advantageous, as the teacher is forced to use ICT when relevant to do so.

Kilkenny City Vocational School

W.R.I.T.E.
(Writing and Reading with Information Technology in Education)

The original proposal for this project was submitted by the then Principal. When she moved to another school the impetus for the proposed plan was lost although the project funding had already been secured. Through discussions with the new Principal and First Year teachers, it was decided to integrate ICT across the curriculum wherever possible to help students increase their literacy, numeracy and overall motivation levels. It was felt that this would blend in with the Department of Education and Science Retention Programme, which the school is also participating in.

The computers had been installed in a Computer room. Teachers were extremely anxious about bringing their whole classes into the Computer room, as they were not confident of their own ICT skills. As a result, an IT Class Assistant, Rita Lennon has been appointed for the current academic year to assist with the delivery of ICT initiatives in the classroom. This is the first such appointment in the post-primary sector. She works in collaboration with the Mathematics and English teachers.

Mary T. Dalton is the Project Co-ordinator and has been key to the development of the programme.

There are two First Year groups and the students have been broken into groups of four and released from their classes for two to three periods a week to go to the Computer room to work with ICT on their numeracy and literacy skills. The weekly spelling lists, written assignments and Maths are provided to the IT Assistant so that the appropriate software packages can be used with the students. Initially, it was difficult for the First Year students to remember when they were to go to the Computer room. After a few weeks, they got into the routine and now do not like missing out on their sessions. The IT Assistant is able to provide individual attention to the students as they attend the Computer room in small groups. It is envisaged that early in the second term, larger and whole class groups will be brought into the room by the class teachers and the teacher will be supported by the IT Assistant. There will be a Web site for this project where the team will provide resources and software evaluations.

There are a number of factors that are contributing to the success of this project: the support provided by the Principal, project leader, IT Co-ordinator and other staff members to the IT Assistant. In addition, the role of the IT Assistant was clearly outlined to the staff prior to the appointment. The IT Assistant has studied the JEB (Joint Examinations Board), and has excellent interpersonal and ICT skills.

The success of the project hinges around the fact that there is a dedicated IT Assistant in place. The students who attend this school need a lot of support and are very challenging to teach. The integration of ICT into the first year curriculum gives students a chance to use computers to improve their numeracy and literacy skills. If the IT Assistant role is not continued in the future there will be a lost opportunity for upcoming students and a lack of support on the ground for teachers. In addition, the time consuming nature of technical problems may be difficult to overcome if the IT Assistant is not available next year.

The next step for this project will be the inclusion of computers into the first year classrooms. Then teachers could break the students into groups while the IT assistant works with some of the students on the computers.

Kilkenny College

Technical Studies Instructional Video

The IT Co-ordinator and two of the Technical Studies teachers at Kilkenny College submitted a SIP proposal to create a Technical Studies Instructional Video. The technical studies teachers in Kilkenny College know that ICT can play a very useful role in the preparation, development and completion of projects. The instructional video will focus on how to use ICT in the research, design, manufacture, evaluation and presentation of projects for:

Leaving Certificate	Engineering Construction Studies
Junior Certificate	Technology Materials Technology (Wood) Materials Technology (Metal)

The video will be split into two parts. The first is an explanation and demonstration of how ICTs can be used; and the second is intended as training in some of the skills needed to use the technology illustrated in the first part. This year's students will be filmed as they complete their projects.

As St. Kieran's College implementation team are using video equipment, Kilkenny College was able to consult with them on what to buy and what not to buy. Technical training on how to shoot and

design the video has also been provided to the team.

The aim of this video is to enable students and teachers, through the use of information and communication technologies, to enhance project work in the technological subjects for Junior and Leaving Certificate examinations.

A Web site will also be created where the lessons learned and resources produced by the team will be provided.

Kilkenny Archival Project

This project involves the teachers and students of each participating Kilkenny primary and special school in developing a school Web site. When this primary school strand was first mooted it was seen at the time as an achievable goal for all of the schools involved. Each school would use the site to promote their school, the history of their locality, famous people of the locality and other student project work. However, not all of the schools were fully aware of the implications of the project and were just delighted to be receiving a free computer, printer, scanner and digital camera. The main issue arising in each school from this delivery of equipment, (as with the Eircom-Gateway delivery in 1998) was who was going to take it out of the box and use it?! Who was going to have responsibility for the project? In many cases, the Principal delegated the task to a member of staff who may have been an IT Co-ordinator or if the post did not exist, the role was assigned to a 'more technically minded' member of staff. However, in two cases the responsibility or a large part thereof has been assigned to a Resource Teacher. Resources are limited — one computer to 30 students in the mainstream primary school. This teacher has the flexibility to withdraw small groups from a class to work on various aspects of the project. This seems to have worked very well.

Each school has developed its own plan on how they are going to implement this project. The plan is relative to the skills, confidence and ICT resources of the teachers in the school. In some cases the teachers will be creating the Web site and in other cases, students will be inputting their own information/class work onto the Web site. The students will generally be in Fifth and Sixth Class. Each school is working at its own pace on their project. When teachers feel confident to use the equipment themselves they will then endeavour to integrate ICT into their classroom. For example, one school has a newly-built building. There is Internet access in each classroom and also in the Computer room. However, the 'Computer room' does not have computers in it, as the school has not got the resources to equip it. Due to this project, the teachers move their computers (which are on trolleys) to the Computer room for two days a week so that a class can work in groups on their projects at one time. The computers are then returned to their original classrooms for the other three days. The project leader told me that on days when the students know they are going into the Computer room, some of the boys get to school early to help set up the room.

The Principal and IT Co-ordinator, if there was one, were and still are the main contacts in each of the schools. Fortunately, in Kilkenny there is not a high turnover of teaching staff from one academic year to the next. However, in the schools where there is an extended team there seems to be a greater momentum for implementing the project.

Digital camera, Internet, email and Web site training were provided initially at night before Easter of 2000. Then a summer course was organised in July and 11 of the 13 schools were represented on this course. At the moment 12 of the 13 schools have uploaded their Web site. In the case of the 13th school the responsibility has just been recently assigned to two other teachers in the school and my priority for them, prior to Christmas, was to encourage them to use the digital camera to take photos of their students and to allow their students to take photos and to print them off. This was achieved and now I feel that after Christmas I may be able to start working on how to develop the Web site with the teachers. Again it is important to implement the projects at a pace that suits the school and the teachers involved.

The principal outcomes of this project will include:

- enhanced ICT skills and greater awareness of Internet-related issues among primary and special needs teachers in Kilkenny,
- enhanced ICT awareness in primary pupils,
- an increased sense of pride in pupils' own work when displayed on the Internet,
- the inclusion of information on local historical sites, people and events on the Web site,
- an increased opportunity for students to collaborate and research their work,
- ideas and resources on how to integrate ICT into the curriculum will be provided to teachers outside the project, from the Web site.

Concluding Comments

There are a number of clear headings emerging from the work of the Kilkenny Information Age School SIP initiative. Before ICT can be fully integrated into the curriculum in any Irish school the following issues need to be addressed:

Teacher training is of vital importance and the NCTE Teaching Skills Initiative has played an important part in providing basis ICT skills at both primary and post primary level. If you ever learned to drive a car, you had to pass a test to get a full driver's licence. The test was important because it forced you to learn the rules of the road and how to drive competently and safely, even if these rules were only heeded on the day of the test. My point is you practised for the test. If you practice computer skills you will then develop them. The ECDL and Intel Teach to the Future courses are offering this opportunity to teachers. It is only when you know how to drive that you can drive to Greece etc. Therefore, it is only when you know how and what can be done with a computer and software that you can begin to contemplate how it can be integrated into your subject area. All this takes time and varies from individual to individual.

Another impediment to the implementation of these projects has been technical issues. A teacher, and in particular, the Project Leader and/or IT Co-ordinator needs time to plan, fix, ring and meet with people to help with these technical issues. Unfortunately, the time required far out weighs the allocation for teacher release time currently available. Nevertheless, it does help. In addition, one of the most frustrating things is dealing with commercial enterprises. Many of these do not see schools as viable customers and hence will not deal with your complaint immediately, unless you are a blood relative!

As the amount of ICT equipment and other new technologies has increased in Kilkenny's schools, we have entered into a three month pilot scheme with a company that will provide technical support by telephone or through their Web site. This type of technical support is fine to a certain degree. However, the teacher still has to make the phone call, take down instructions from the phone (if the phone is not in the Computer room) and carry out the repair him/herself. This all takes time. There needs to be a concerted effort by the Department of Education and Science to provide financial support towards the maintenance of computers and computer systems in schools. If schools have financial support they can contract a local company for a maintenance contract or they can group together to obtain a more cost-efficient contract.

The SIP projects in Kilkenny have started, plans are in place, training has started, teachers are motivated, technical issues are being ironed out and students are using ICT in an integrated way with their curriculum. However, I feel that the maintenance issue is going to influence whether these projects will go on in the future. Yet, for vocational, social and pedagogical reasons ICT seems to be here to stay in Irish schools. Kilkenny City schools have risen to the challenge of integrating ICT into the Irish primary and post primary curriculum and will be positioned to the forefront of ICT development.

The lessons learned and resources produced by teachers involved in these projects will be available through http://www.sip.ie/sip055.

Dundalk Learning Network:
Education ICT in the Community

John Rust

Introduction

The purpose of the *Dundalk Learning Network* (DLN) Schools Integration Project is to establish a connected learning community in the Dundalk area that will include schools, the community and local enterprise.

A three-pronged approach has been designed to provide the most realistic method of achieving this goal. It includes:

1. the development of a technology infrastructure that allows access for all the project partners to a Dundalk Intranet,

2. the establishment of the requisite support structures and training programmes (essential to sustain interest and momentum),

3. the implementation of a series of initiatives to engage the partners in utilising the new facilities productively.

The *Dundalk Learning Network* SIP involves using Web-based technologies to enhance communication between schools and between the schools and the wider community; *Wired for Learning*, a suite of collaboration software programs from IBM, is used by the DLN to achieve our goal.

Project Background

In 1997, Dundalk Chamber of Commerce initiated and co-ordinated Dundalk's submission to the Telecom Éireann (now eircom) Information Age Town Project. The idea of a 'Wide Area Network', initially named DMAN (Dundalk Municipal Area Network), was explored and developed. The activities of the Industry Committee led to the establishment of a new company, Dundalk 2000 Information Age Limited. This company was set up to establish and administer an Endowment Fund for Education and Community using monies donated by local companies. The Endowment Fund's initial campaign raised £100,000.

The launch of *Schools IT 2000*, a Department of Education and Science initiative for the integration of Information and Communication Technologies (ICT) into Irish education, provided Dundalk 2000 Information Age Limited with the opportunity to present their vision of a Wide Area Network in Dundalk to representatives of the Department of Education and Science and the National Centre for Technology in Education (NCTE). Subsequently, NCTE helped refine the model for *Dundalk Learning Network* and so our Schools Integration Project (SIP 059) was launched.

Dundalk Schools that had applied for SIP funding, or that were successful applicants for funding from the *Dundalk 2000* Endowment fund, were invited to participate in DLN.

In addition, NCTE arranged for DLN to join Cobh and Blakestown schools in the joint *IBM* and Department of Education and Science Wired for Learning (WfL) £1.5 million initiative for Irish schools.

Wired for Learning is an Internet-based initiative concerning communication among all of the school community. Its suite of applications is installed on a school or district server and allows access from home, the work place or anywhere across the globe. This is made available either as guest access or registered user access — with the latter obviously having privileges and facility that the former does not.

In its essentials, *WfL* makes it possible to extend the school day and involve in education, the broad community previously 'beyond the classroom walls'. It provides teachers with increased opportunities to communicate and collaborate with other teachers and it provides parents and community members with a portal for involvement with school life. If used well WfL offers unrivalled opportunities for students to apply their knowledge to — and learn from — real world experiences.

Project Partners

There are eight schools in the *Dundalk Learning Network*, three Primary, four Post Primary and one Special School. These schools had either applied for a SIP or had made a successful application for funding from Dundalk Information Age Ltd. (A full list of partner schools is included in the Appendix.)

NCTE is a major sponsor of this project. Our industry partners include IBM, Quantum Ireland, AIB, Fyffes, ESB, Glen Dimplex, KPMG, National Pen, DigiWeb and many others who support the project through Dundalk 2000 Information Age Limited.

Each school has agreed to a minimum of two hours per week community access to their computer facilities.

Project Aims

We are keen to develop a human and technical infrastructure that revolves around our unique learning network. As such, we would aim to achieve as outcomes:

- a project group of schools with a strong and modern technology infrastructure,

- a project group of schools with a teaching staff trained in the use of IT in an educational context,

- a DLN server accessible to the entire Dundalk community,

- a stable software platform able to provide an effective and secure communications tool,

- a situation where each project school is the focal point for community use of and, access to, ICT,

- a DLN server providing a focal point for local business to encourage the use of the DLN for advertising, communication, sharing information and other general use,

- a model for the support of each school's IT infrastructure.

Project Development

In December 1999, I was seconded to the NCTE to act as a full time project co-ordinator for the Dundalk Learning Network; I am based in the Dundalk Institute of Technology's Regional Development Centre.

By January 2000, the management structure of the project was finalised, and a steering committee was in place. This committee consisted of:

- the Principal of each Network school,

- the National SIP Co-ordinator, (Mr. Séamus Knox),

- a representative from Dundalk 2000 Information Age Limited,

- a representative of Dundalk Employment Partnership,

- the IBM Wired for Learning project manager,
- the Head of Computing in DkIT (Mr. Denis Cummins) Chairperson of the Group.
- the Project Co-ordinator (John Rust).

This group is wholly responsible for the management of the project and meets for regular monthly meetings. A Management Committee was also formed, consisting of an IT teacher from each school. In addition, a Curriculum Advisory Group consisting of teachers and community advisors was created to advise on curriculum content.

An order for a server was placed with IBM. The specifications decided upon were; twin *Pentium Xeon* 550MHz processors, 1Gb of RAM, 108Gb Hard disk in a RAID[1] format of 6 x 18Gb's.

As project co-ordinator, I visited each project school and completed a technology audit with the assistance of each Principal. Our assessment highlighted the need for additional resources to be allocated to some of the schools — a need that the NCTE addressed by providing grant assistance.

During this period Dundalk Information Age Town Ltd., released a large portion of its Endowment Fund to a number of project schools. These funds were used for IT purposes only. Each school has a networked computer lab with between 15 and 30 PCs and also a data projector; Internet access is provided by 128k ISDN lines.

Negotiations began in February with *eircom* for fixed Internet access for the DLN server. A 256k 'leased line' was ordered from them to provide access to the server and its software. Figure 9 represents this arrangement graphically.
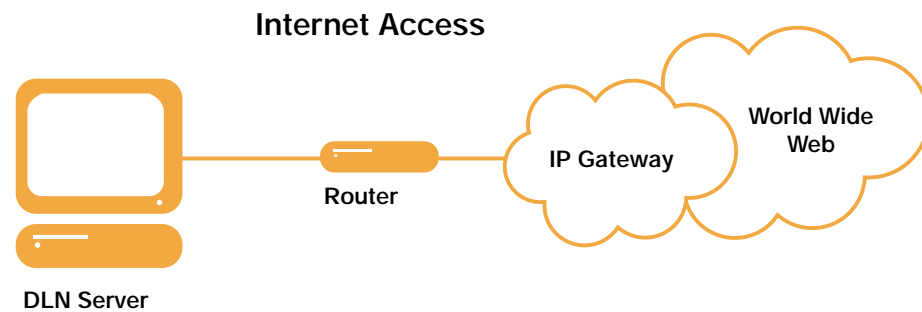
Internet Access

Figure 9: The DLS Layout

The initial set-up costs were £21,000; the annual running costs will be in the region of £18,000.

Assembling the various threads took time and a further month passed before the server could go live. Finally, domain name registration was completed; the essential IP addresses were allocated; the server was assembled; Windows NT server software and Lotus Notes software was installed; and IBM software engineers configured the Wired for Learning databases for each of the eight schools.

In recognition of the large investment made by Quantum Ireland Ltd., the DLS server was named the 'Quantum Municipal Server'.

On the 25th of March 2000, the server went live on the Internet. Figure 10 represents the architecture involved.
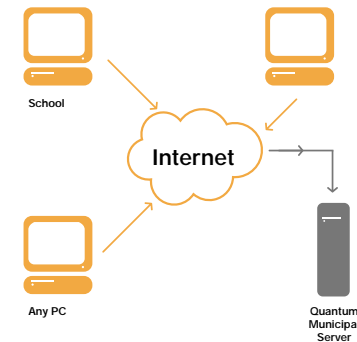
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1   Random array of inexpensive disks.

Figure 10: The Quantum Municipal Server Arrangement

During March, each school nominated one or two teachers who were willing to train as 'Key Tutors' and who were also willing to assume the role of 'School Administrators' for the project. A three-day training course was provided for these tutors on the Wired for Learning software. The software is Web-based, accessed using either Netscape or Internet Explorer browsers. During the training course the tutors made invaluable contributions to IBM software engineers who were in the process of adapting the software from its original American format to one that was more suitable for an Irish educational environment. Whilst this process is still on –going, it is worth noting that inconsistencies between American and Irish educational systems caused a certain amount of frustration during the early months of the project roll-out to the Dundalk Learning Network schools.

During the spring and early summer, teachers were trained in the use of the Wired for Learning software.

In hindsight, embarking on a training program during this busy time of the school year was probably not the ideal route to take; experience has shown that the autumn and winter terms appear to be a better time to run courses. After nine months of the project, 55% of teachers in the 8 project schools have been trained to use Wired for Learning. During the early days of the project it became apparent that the IT teacher in each school needed support in maintaining the IT infrastructure in place in their school. The NCTE and IBM designed a Windows NT course and the IT teachers from each attended an intensive three-day course in IBM head-office.

Finding a suitable date for an official project launch proved to be a difficult obstacle to overcome. It was six months into the project before the official launch took place. The wait was well worth it! The publicity from the launch helped raise the project profile in Dundalk and it also generated interest from the Post Primary schools in Dundalk that were not involved in the project. Each of these schools has applied to join the Network.

Further official recognition of the project was achieved in September when one of the Network schools hosted the visit of the European Commissioner for Education, Sport and Culture Ms. Viviane Reding and the Minister for Education Dr. Michael Woods. After watching a number of presentations and speaking with teachers and parents Commissioner Reding said,

'From what I have seen today, Dundalk is way ahead of other parts of Europe in terms of advancements in IT, and the partnership between schools, industry and community sets an excellent example. The work that you do here as part of the Dundalk Learning Network will help other schools throughout Europe to adopt the project, and I will certainly bring stories of its success back to the European Commission.'

As well as providing the Network with technical assistance and the Chairperson of the Steering Group, Dundalk Institute of Technology also provided the project co-ordinator with a shared office space in the Development Centre. The Centre is a valuable resource for small companies or individuals who are developing a commercial enterprise. The success of the Network to date, the publicity gained from the official launch and the innovative nature of the project caused the Institute to re-examine its relationship with the project. It was considered more appropriate to provide the Network with its own private office in the Development Centre and to list the Network as one of the 'Incubation Enterprises' in the building.

Network Activities

Schools

Schools in the Network have benefited from considerable financial investment that has improved the standard of the IT infrastructure in their schools. One of the negative results of this improvement has been the added burden of the maintenance of the computer facilities. The full-time nature of the position of project co-ordinator has proven to be an important resource for the Network schools in this respect. School principals have called on him to assist with network problems, offer advice on IT hardware or software purchases and so on.

Software

Wired for Learning features a suite of applications that enhance collaboration between teachers and parents, teachers and students, parents and the school.

All users must agree to an acceptable use policy during the registration process. The registration process also links parents and their children to their school within a searchable database

This allows access to the following:

- *Events@School* provides an online school calendar,
- *HomePage* provides an easy to use interface for creating Web pages,
- *Private Conference* provides a secure means for parents and teachers to communicate online,
- *Instructional Planner* allows teachers to create lesson plans and higher level Unit Plans and subsequently share these valuable resources with other teachers within the Network,
- *Talk@School* provides a community-based bulletin board facility,
- *Teachers Lounge* provides a secure means for communicating within a school,
- *Team Projects* allows teachers to assign work to students in a non-class contact method.

This paper is being written midway through the life of the project and so we have reached the stage where generation of content is extremely important. With appropriate content, teachers will have a legitimate reason to make use of *Wired for Learning* to collaborate with their colleagues and to work within the *WfL* framework with their pupils. This activity will be discussed later in this paper.

Use of the *WfL* software peaked during training courses but dropped to much lower levels of use as the school year has progressed. Each school has content posted on its *Events@School* database. The IT teachers across the eight schools make occasional use of the *Teachers Lounge*. Every teacher who is registered has their own *HomePage*; a number of teachers update these pages on a regular basis.

Student Use

I personally work with two groups of Transition Year students; visiting their schools on a weekly basis, I help these students with HTML, Web page design and general computer skills. The students are designing Web pages for a portal *Wired for Learning* site that can be viewed at

http://www.wiredforlearning.net. These classes are a useful and practical addition to the Transition Year curriculum.

Transition Year students are receiving instruction in *Wired for Learning*. A special Team Project has been set up so that Transition Year students can access Web page design tasks from home or during computer class when the project co-ordinator is not able to be present. The students also use *Team HomePages* within the *Wired for Learning* framework to showcase the work of their small business enterprise schemes. The response to these classes has been very positive; parents viewed the HTML work of the students during a Transition Year night and they were very impressed with what they saw.

The classes also provide an opportunity for the project co-ordinator to meet with the school principal, the IT teachers and also the school staff on a regular and informal basis.

Parent Use

When schools joined the Network they agreed to open up their computer facilities to the general school community for a minimum of two hours per week. This has proved to be an excellent facility for the parent body. A group of twenty parents have been trained to act as parent tutors. The majority of these parents already had a high level of computer expertise; they received training in the use of the *Wired for Learning* software and provided valuable input into the development of a course for the wider parent body. The reaction of these parents to the *Wired for Learning* software was very positive. They felt that the software would strengthen and enhance the communications between parents and teachers. The ability to enter an online *Private Conference* from any Internet access point with a teacher was warmly received. Use of teacher *HomePages* to inform parents on homework policy and to provide homework content to pupils absent from school due to illness, was seen as a positive reason to use the Internet. Each of these parent tutors agreed to deliver a course in their respective school to other parents. During these courses it is hoped that other parents will be identified who would be willing to become tutors themselves.

Wider Community

Dundalk Learning Network is a partnership between education groups, industry and the community. The implementation of a series of initiatives to engage the partners in utilising the new facilities of the server and the Wired for Learning software productively, is one of the projects main goals. The first step in achieving this goal was the development of a basic computer course and the offering of it to one of our partners. A group of twenty-four employees of *National Pen* received basic IT training during the summer months using the computer facilities of one of the Network schools. This training was delivered at a time when the school computer room in previous years had been closed for school holidays. In return for this training, *National Pen* provided the Network with a supply of promotional pens bearing the Network logo, Web site URL and the names of the project schools.

The Road Ahead

The coming months will see a consolidation of the project across the eight Network schools. The technical infrastructure that is necessary to facilitate a connected learning community in Dundalk is in place. The core Network schools have a solid IT base that allows teachers, students and parents to access the Wired for Learning site from within the school. Generating curriculum-based IT content is a priority for the remainder of the current school year. The Wired for Learning software will be utilised to engage teachers, students and parents in a broad range of initiatives. The role of the Management Team and the Curriculum Advisory Group will be crucial to the success of these initiatives.

The IT teachers on the Management Team will liaise with and assist the parent-tutors during the delivery of IT courses to parents. They will also manage their own school-based IT initiatives. The

Curriculum Advisory Group will guarantee the integrity of the initiatives and ensure that the 'technology' does not overshadow the educational content of the initiatives.

The remaining Post Primary schools in Dundalk have written to the NCTE requesting admission to the Dundalk Learning Network. There are also a considerable number of Primary Schools that have expressed an interest in being part of the Network. The development of a model that will facilitate the entry of other schools into the Network will be an important step towards the expansion of the project across the whole community in Dundalk and surrounding areas.

Another avenue that requires development is the generation of interest among the business community of Dundalk in using the DLN server for advertising, communication, sharing information and other general use. A partnership between the business and education communities will provide a solid foundation, ensuring the future financial viability of the Network.

The geographical location of Dundalk offers the unique possibility of 'Cross-Border' co-operation, with schools and the community of Northern Ireland linking to the Wired for Learning software on the DLN server.

One of the *Wired for Learning* applications, the Instructional Planner, has the potential to become a valuable resource for all teachers, not just in Dundalk, but also all over the country. As explained earlier in the paper, Instructional Planner allows a teacher to share their educational expertise through the creation of unit plans, lesson plans and activities. This expertise could be in the form of subject content, methodologies, classroom management strategies or approaches for dealing with literacy issues. However, this feature requires a large time commitment on the part of teachers to compile these plans. Teachers also need time and opportunity to access computers either at school or from their own homes. Less than 50% of the Network teachers have Internet access from home. If an initiative could be implemented to improve this figure, then perhaps teachers might be more disposed to use the Instructional Planner.

In the overall context of the SIP initiative, *Dundalk Learning Network* came on stream considerably later than the majority of other SIPs. Although the project has achieved a number of its declared goals there is still a considerable amount of work to be done. While a clearer picture of the impact of the Network on the project partners will emerge by the end of the current school year, most of those involved in the project hope that further resources will be made available so that the project timeline can be extended.

Dundalk Learning Network has shown how a variety of project partners can come together and co-operate effectively at differing levels. There are many challenges ahead, challenges that the partners can surmount so that a genuine, connected, learning community can flourish in Dundalk.

Appendix

Schools involved in the DLN:

- Redeemer Boys' School N.S.
- S.N. Muire na nGael
- St. Joseph's N.S.
- Coláiste Rís Post Primary School
- St. Louis Post Primary School
- St. Vincent's Post Primary School
- O' Fiaich College (VEC)
- St. Brigid's Special School

Figure 11:
The WfL Interface

Wired for Learning: A School Administrator's Perspective

John Tyrrell

Introduction

Scoil Mhuire Senior in Blakestown, is one of three sites engaged in the *Wired for Learning* SIP project *(WfL)*. Blakestown is a western suburb of Dublin situated beside the Blanchardstown Shopping Centre. The primary schools are designated 'disadvantaged' by the Department of Education and Science (DES), and the Community school receives similar concessions. Together, the three schools form one of three sites nationally in a *'Wired for Learning'* project sponsored by IBM and funded jointly by IBM and the DES through the national Centre for Technology in Education (NCTE). The project is in its second year, although negotiations with the DES continued for a year before the schools became involved.

What I propose to do is outline, as succinctly as possible, what you would see of the project if you visited a *WfL* school — what teachers are doing, what children are doing and what parents are doing. But to make sense of this, it will be helpful initially to outline some of the essential elements of *Wired for Learning* that we have used to date: how we use them; and their impact on the school community.

I will then outline the context of *Wired for Learning* — the other schools/sites involved and the roles of NCTE and IBM (the industrial partner who has committed considerable material and human resources to the project). I expect that the journey of teachers from the start to their present state will be of interest and should be acknowledged.

Looking to the future, one of the major challenges is the task of sustaining the commitment and supporting the on-going professional development of teachers. In this context, the technical expertise, while important, may be considerably easier to provide than the education and professional development that is required to optimise and integrate the use of the technology in the classroom. Industrial partnership — the relationship of the industrial partner to the school as it engages in development planning is significant, particularly in the context of the introduction and implementation of the new curriculum with which all primary schools are engaging right now.

When I return to the present position, I will outline in more detail the applications we have used to date, their organisational and logistical implications and speculate on where we might go from here.

The Background

Scoil Mhuire Senior

Scoil Mhuire Senior is a senior primary co-educational school with an enrolment of 360 pupils, situated beside Blanchardstown Shopping Centre. We share this Wired for Learning site with our colleagues in Scoil Mhuire Junior and Blakestown Community School. The school is designated as educationally disadvantaged under the DES scheme.

Disaffection among a significant minority of pupils manifests itself in a negative attitude to authority, lack of motivation and resistance to learning. The effects of this on the day to day working conditions of teachers are very wearing and make recruitment and retention of suitable teachers, particularly substitute and supply teachers, difficult at times.

While increased employment with the advent of the 'Celtic Tiger' has improved the economic status of families, many of the jobs are unskilled or semi-skilled, involve unsocial hours and are mostly available to females. Mothers, who were the stabilising home influence, are now often absent when children are home from school in the evenings or before they leave for school in the mornings. Apart from a few exceptions, children are generally well nourished and clothed. A significant number of them stay up late at night with little supervision of television viewing. Parents who try to regularise children's routines find themselves in conflict with prevailing cultural norms.

Teachers are committed, talented and supportive, and the atmosphere in the school is characterised by care and mutual respect. While relationships between teachers and pupils are friendly, teachers diligently maintain good discipline in their classes. There is a perceived need to keep routines regular, as a minority of difficult pupils in each class do not cope well with change, and resultant disruption can spread very quickly.

Participation in this IT project has provided the school with a computer laboratory containing fifteen computers. Additionally, each classroom is equipped with a computer and a small number of computers, in a dedicated room, are provided for educationally disabled children. All the computers in the school are networked and are linked to the internal school intranet as well as having access to the Internet. Teachers in the school have participated in up to eighty hours of training. Many have spent time voluntarily after school hours, individually or in clusters, extending their skills.

Schools — Business Partnership

This partnership involves clusters of schools located at three sites, (Blakestown, Cobh and Dundalk), IBM, the DES (represented by NCTE) and Eircom who sponsor *Schools IT 2000.* While regular links exist between the various schools involved, the evolution of *WfL* is different in each school, although considerable similarities do exist.

IBM

IBM have been involved in schools educational programmes around the world — North and South America, Vietnam, Australia, Italy, the UK, etc. However, involvement in schools-business partnership has been a new experience for IBM (Ireland). *Wired for Learning* was developed in the US, driven to a large extent by the passion of IBM chairman, Louis V.Gerstner, and the obsession of Americans with falling standards and the need for school improvement.

In the short time that the partnership has existed, significant progress has been made in the levels of understanding on both sides. However, much remains to be achieved. Increased knowledge sharing and enhanced communication have dissipated some teachers' suspicion and mistrust about motives and motivation of IBM. However it is also important that IBM personnel realise and respect the validity of the reservations of teachers regarding such issues as parental involvement, assessment and evaluation of pupils and programmes, and other pedagogical and moral elements, which are part and parcel of the education process. Evidence indicates some progress in this area.

As well as the hardware provision outlined above, IBM have been very actively involved in support of the implementation of *Wired for Learning*. They have organised several change-management workshops, have brought personnel from the US to share *WfL* expertise, have created management and communication structures which have strengthened the process, and have brought some people to *WfL* sites in the US at crucial stages of the implementation process. Some aspects of their 'Project Management Structure' have been adapted successfully for the curriculum and development planning of our school.

NCTE

The contribution of NCTE is significant on a number of fronts:

* the design and funding of specific training for teachers, beyond the national Phase 1 and Phase 2 courses.

- funding for additional *eircom* charges,
- the provision of 0.25 of a teacher has been crucial to the success of the project, despite the difficulties of procuring substitute cover.

The Contributions of Teachers

At a time when teachers are coming in for so much criticism about what the public often perceives as short hours, inflexibility and resistance to change, I think it is appropriate to acknowledge the contribution of teachers to this specific project, and indeed to the *Schools IT 2000* initiative nationally.

Despite lack of consultation in the protracted start-up negotiations, all teachers rowed in behind the project from day one, placing the good of their pupils above their own personal reservations and apprehensions

Skills acquisition through participation in Phase 1 and Phase 2 of *Schools IT 2000*, specially designed *WfL* courses, ECDL etc., has enhanced the ICT competence of teachers throughout the school, with consequent benefit to pupils.

People have been most generous with their own 'after school time', staying back in the Computer room, taking home laptops, preparing lessons and lesson plans for adaptation to the technology. Without this kind of commitment, the project would not have succeeded to the extent to which it has. At a time when demands for productivity figure so prominently in pay negotiations one can only wonder whether account will be taken of the productivity being delivered by teachers before the introduction of any pay increases. Apart from IT innovation, teachers need to find a language that adequately describes the complexity of the job they do and quantifies the input required for successful implementation of curricular reform.

Having a dedicated IT co-ordinator has been crucial to the development of the project also. Apart from the technical skills required, there is the very complex task of constantly moving the staff along, identifying various (most often unexpressed) needs of teachers, knowing when to intervene and when not, providing software and having it evaluated, keeping staff informed of developments as the project evolves — all require a lot of skill and demand a lot of time. Following staff discussion, we felt it appropriate to allocate a person as fulltime co-ordinator for a couple of years, from our normal teaching allocation.

School Objectives for IT

By adapting the core objectives of *Schools IT 2000* to the needs of our school and the specific potential of Wired for Learning, we articulated a set of school-level objectives for our project. These were:

- to enhance the relevance of education for children by using Information and Communications Technology,
- to tackle the high rates of literacy problems among disadvantaged pupils through the use of ICT,
- to better prepare children for a future which relies heavily on ICT,
- to implement Wired for Learning as a professional development tool,
- to enhance teacher/teacher communication and resource sharing,
- to involve and engage parents and the local community in their children's education.

Wired for Learning Applications

Wired for Learning is based on *Lotus Notes/Domino* technology and consists of the following suite of applications, each of which facilitates a specific aspect of the project.

- *Private Conferences:* This feature can be used to set up private conferences between a teacher/parent, teacher/student and teacher/teacher.
- *Teachers Lounge:* This feature allows for threaded discussions that are restricted to teachers only. Its purpose is to facilitate discussion between teachers.
- *Team Projects:* Teachers use this feature to set up and assign students to collaborative Web-based projects.
- *Instructional Planner:* This provides a framework for teachers to develop and share lesson plans and resources.
- *Homepage Designer:* This feature enables teachers and students to create a personal homepage which can also be used to communicate with parents.
- *Events@School:* This is an online calendar of school events.
- *Talk@School:* This is a discussion area open to anyone who is registered on the Wired for Learning site. It is devoted to community-based discussions on school and school-related issues.
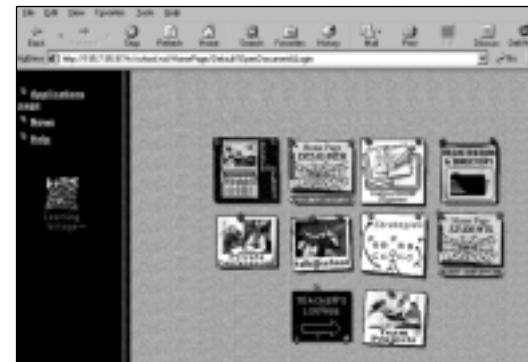
Figure 12: A Screen Grab showing the User-friendly Interface of the WfL Home Page at the Blakestown Site.

Plans for the Future

It would be difficult to overstate the progress of the past year. Familiarity of pupils and teachers with the technology has benefited the school on many levels and we look forward with confidence to further growth and development. For a variety of reasons, the rate of progress will inevitably decrease as the process and its applications increase in complexity. We need to ensure that we conserve the progress to date as well as further develop suitable applications. Accordingly we aim to:

- Sustain the use of *Teachers Lounge* in the Planning Process — this has had a very beneficial effect on the school and has enhanced professional development of teachers. It provides a facility to maintain ongoing electronic conversation between staff meetings.
- Promote greater awareness of the *Class Homepages*. This has a very positive effect on 'Pupil Morale', promotes self esteem for groups, with the positive knock-on for individual pupils.

- continue the use of the *Instructional Planner* by using it as a resource repository. The role of the Instructional Planner as a lesson repository has been somewhat overtaken by the advances made in ScoilNet. A recently published handbook on the usage of this has been circulated to schools by NCTE.

While the use of Private Conference for communication between particular groups of teachers (e.g., class teachers and special needs teachers) is being considered, there is concern among some teachers about the implications of storing confidential information. It is used as a vehicle for exclusive consultation between groups of teachers (e.g., the Confirmation classes).

Access for Parents has been flagged as an integral part of *Wired for Learning* from the start. For technical reasons, remote access to Scoil Mhuire's (Junior and Senior) *Wired for Learning* site is not yet available to parents. While initial training has been provided for some parents in anticipation of such access, the implications, conditions and access content for parents need to be considered carefully by teachers ahead of the provision of such access.

Conclusion

The launch of *Schools IT 2000* would seem to mark a major innovation in terms of the financial investment and the scale of change envisaged for education ICT in this country. This seems nothing short of radical. From our experiences of the *Wired for Learning* project, we would suggest that two of the more urgent issues in need of address are those of partnership and time.

Partnership

Research literature in the area of partnership for education ICT all too often neglects investigation of school/business partnerships. Where such partnerships exist, they are generally confined to second level schools and rarely go beyond the provision of financial aid to cash-strapped schools or the provision of work-experience for Transition students. However, the *WfL* partnership promises much more. It is still in its infancy and much remains to be done if the benefits are to be realised in the best interests of the students, teachers and the community at large.

Time

The amount of time required for the implementation of projects on the scale and ambition of *WfL* and indeed also required for the many other reform initiatives facing our schools, needs to be recognised. 'Snatched moments' before or after school, at lunchtime and so on, do not even begin to provide the quality time required for consultation, discussion and professional consideration that are essential if such reform is to take root. The allocation of 45 days substitute cover to release teachers to engage in *WfL*-related activity has been of enormous help to many individual teachers and to the development of the project. The efforts required to procure substitute cover pay handsome dividends for the school. It is, however, unrealistic to expect present pupil contact time to be further reduced. Perhaps it is time to consider lengthening the school week and paying teachers for the additional time and expertise that serious reform requires.

Becoming Digital: The Ennis Primary Schools SIP Initiative

Anne Walsh

Introduction

To put this wide-ranging project in context, it is necessary to go back to September 1998 when a local taskforce was successful in its bid for Ennis to become what is now called *eircom* Ennis Information Age Town. This new status caused huge excitement among the people of Ennis but the schools quickly realised that while the abundance of equipment attaching to the initiative would offer the opportunity for dramatic changes in teaching and learning, it would also bring new challenges to the teachers of the town.

Dr. Kyran Kennedy, director of the Clare Education Centre, rallied the principals of the Ennis schools. They met to discuss the 'digital' future, and in a first move towards taking the initiative in this, set up a steering committee led by Pat Hanrahan, Principal of Scoil Chriost Rí — an early champion locally of the use of Information and Communication Technologies (ICT) in the curriculum.

Principals nominated co-ordinators in their schools to help draw up a plan to make effective use of the opportunities ahead. Fortunately, many of these co-ordinators were people identified as facilitators by the Information Age Town and had been given basic training in computer use. Their expertise was to be a real benefit, not only to their schools, but also to the Schools Integration Project (SIP) which also developed from those early meetings.

The Steering Committee and co-ordinators met on a regular basis for several months, but when schools were asked to put their ideas on paper to be included in a joint submission under the newly announced SIP arrangements, this proved to be a daunting and extremely protracted task. Brainstorming sessions and discussions continued until every school was satisfied that they could contribute to the project in some significant way. This process required great tenacity on behalf of the chairman — some schools were well advanced with IT while others had virtually no experience, with the result that all brought different interests and expectations to the discussion. In time, however, a detailed project submission was drafted by the Steering Committee and sent to NCTE.

The Information Age Town project equipped our schools lavishly in ICT terms: each primary school was equipped with one PC to every nine pupils and Networked Rooms were installed in all except one Junior and one Special school. Each school received digital cameras, scanners and data projectors. The Special school was furnished with nine touch screens, switches and other adaptive devices as well as their wish list of software. Given the technological richness of our new setting, the project focused on the processes that were likely to be involved in harnessing this for teaching and learning purposes, rather than on the technology itself.

Much to our delight our proposal was approved.

Project Purposes

In broad terms, the purpose of our project has been to examine and record the processes involved as teachers grappled with a huge range of technological equipment. The challenge lay in capturing what people decided to do with the equipment, and the changes, if any, in teaching and learning that evolved from this use.

Two things made this challenge even more daunting:

Even before the Information Age Town initiative, some of the Ennis primary schools had already arrived at a stage where they were quite comfortable with new technologies. However, the majority of teachers in the town were a little apprehensive at the prospect of mastering new skills and then finding ways of using these to enhance learning for their students. Progress in ICT usage and thinking would consequently — at least in the initial stages of the project — be very mixed and uneven.

Secondly, uniquely among SIP settings, the Ennis SIP tried to involve *all* primary teachers in *all* our schools and not just restrict the activity to one or two champions in each school.

Notwithstanding the above, we relished the opportunity that SIP presented.

Early Decisions

A number of possible avenues of progress for our work quickly became apparent to us:

With such a large number of computers in the Ennis homes, the project could usefully explore the area of communication between home and school. In establishing and monitoring ICT-facilitated links between home and school, it was hoped to communicate school notices and also to pilot some homework activities.

Another intention of our project was to publish an account of our experiences and the processes involved. One of the earliest decisions we made was to pursue actively the idea of publishing to the Web as individual schools, or collectively as appropriate. A very considerable amount of innovation was to result from this decision.

We chose also to seek close and meaningful relations with our three key partners:

eircom **Ennis Information Age Town,** who provided the original equipment, provided training for tutors, teachers and LAN administrators and now also part-fund technical support.

The Clare Education Centre which acts as an educational partner and a valuable resource for the project. Advice is available from the ICT advisor and director. (The project's full time co-ordinator has an office and facilities at the Clare Education Centre.)

The NCTE who provided funding for software, training and other incidental expenses, and who funded a full time co-ordinator for the project as well as partial release for a co-ordinator in each school. (They also part fund technical support as a pilot in this area).

Each of these was to have a major bearing on the direction and nature that the project later assumed.

Milestones and Achievements

We are now a year and a half into the project and a wide range of deeply integrated, curriculum-driven use of the ICT and other new technologies are day-to-day reality in Ennis primary schools. Typically, our students are involved in collaborative email projects both national and international. The younger children have used email to communicate between local schools, while older children have been involved in a wide range of national, European and international projects. Many have become highly proficient in multimedia authoring, word processing and using the Internet as a resource to help with their studies. They handle scanners and digital cameras with ease. Students throughout the town are using a wide range of software packages in creative and effective ways to add value to their class work. In fact, computers have become a natural and useful means of extension to all areas of work in our schools.

Aside from direct curriculum use there are other areas that we have addressed in our project. These have included the management of networked rooms, technical support issues, communication between home and school and our Network survey, which looked at Ennis teachers' views towards using networked rooms. They have also included some significant changes in our classroom practices such as using peer-to-peer ICT tutoring to produce materials in younger classes.

We have also made appreciable progress in relation to the challenges we set ourselves regarding Web publishing. A dedicated SIP Web site now draws together many of the achievements of our project. This can be found at http://www.sip.ie/sip058. But each school has also developed its own Web site which also contains a dedicated section for SIP content. These are mainly used to post detail about the projects that the schools are involved in, with the resources section of the site giving detail about curriculum-based projects and related teaching activity. Typically these projects cover a wide range of activities from very simple activities using *Word* or *Paint* to elaborate, cross-curricular work.

For example, the First Class children made a record of the birds that they saw daily in their school yard. They later used Word to write about the birds, then drew pictures or used clip art to illustrate their writing. The children are not taught keyboard skills but still are encouraged to use their computer to present their work. There are many examples of similar work on the school Web site and on those of the other schools. In general, these also link to information on the teachers underlying objectives for the activity in question. The Holy Family Junior School site can be found at http://hfjs.ennis.ie.

Our unique circumstances also allowed us to look closely at the issue of managing networked teaching rooms. As mentioned earlier, we now have a large concentration of such rooms in the town. The management of these rooms has proven a serious challenge to the schools and they have tried to find solutions to this in a number of different ways. Three schools opted for full time ICT resource teachers who are also fully responsible for the management of the school network. Others rely on individual school co-ordinators to take charge of the management of the network and also teach a class full time. A number of schools have split the role between two or more people who share the task.

None of these, however, have proved to be without their problems. In the first instance, the teachers in question come from within the normal teacher-allocation of the school. The result is an increase in class size/pupil-teacher ratio. In addition, resource teachers are often needed for other resource activities and so time given to computer work results in less time being available for these. This could be particularly problematic if the resource teacher in question also has a special needs brief. The second scenario — the part-time ICT resource teacher — causes very considerable stress to individual teachers. Whether working alone or with a colleague, teachers in these part-time roles still find it necessary to undertake long hours of voluntary work after school or at the weekends to keep abreast of necessary work.

The nub of this is, of course, the issue of technical support and service. The model we piloted involved funding an outside agency — in this case a reputable local IT firm — to regularly visit and maintain our school facilities. This was funded jointly by *eircom* IAT and NCTE.

Two points emerged very strongly from our experiences in these areas:

Full-time ICT teachers will increasingly be required to meet demand as more and more schools arrive at the level of ICT infrastructure we have in Ennis. The core function of these teachers should concern the management of the school's ICT resources, and the facilitation and integration of ICT throughout the school.

Technical maintenance — beyond very basic 'troubleshooting' — is best left to capable technicians, not teachers. Otherwise valuable teaching and learning time is lost in a frustrating and frequently unsuccessful search for fixes and repairs.

In our original submission we expressed our intention to explore the setting-up of ICT-assisted home/school learning situations and channels of communication. Given the number of Ennis homes buying-into the IAT programme, we saw an excellent opportunity to address this area. However, we recently surveyed the homes of children across the primary schools for email addresses and found that only about forty-five percent had activated their Internet and email accounts. Financial reasons were cited in most cases but other reasons also played a part. For instance, the majority of students from the two special schools lived outside the town boundaries and so did not qualify for a subsidised PC under the IAT scheme.

With less than half of our students able to access email communications and activities, this part of our project had to be put on-hold.

The evaluation of software, especially that used in networked rooms, was another area of attention within our SIP. We had originally intended to evaluate one particular Integrated Learning Programme but for a variety of reasons the schools decided to take up other software options. We have not therefore progressed as far in this regard as we had hoped. However, even the evaluation that we did complete proved quite difficult. The majority of project teachers are not familiar with the process and found the guidelines we had been given too inflexible. However, we have now developed our own framework and hope — with the benefit of some extra training from the NCTE — to improve the quality and quantity of evaluations published on our SIP Web site.

Another aspect of our SIP dealt with how teachers used the networked rooms and particularly how they integrated time in the school's networked room with their class work. A variety of practices emerged as the year progressed. When surveyed, many of the teachers evidently still regarded work in the computer room as something extra and separate from their real work in the classroom. However, there was also evidence of much innovative and creative teaching in the schools and the number of teachers in this bracket is increasing rapidly.

Finally, there is the question of widening the circle of ICT-active teachers.

In our original SIP submission we stated our intention to work systematically to involve all teachers in all primary schools in ICT-enhanced teaching activity. Getting such a large group of teachers on board has been a considerable challenge for the principals and co-ordinators. All Ennis teachers availed of the initial induction course in basic computing provided by the Information Age town. This was followed by an almost 100% uptake on the NCTE Phase 1 and Phase 2 courses. The Clare ICT advisor and SIP co-ordinator have provided extra training and support through user groups which address areas like software use, multimedia authoring, Web design, use of digital cameras, scanners and other peripherals.

This has been one of the strengths of the project.

As groups of teachers gained proficiency in these areas they began to gain confidence and started to see the possibilities of using ICT to enhance the teaching and learning in their classrooms. Many of the schools developed support groups for their staff — often holding their meetings and activities in the school's own networked rooms. This proved to be a highly effective way of getting teachers to share ideas and think out new initiatives.

Impacts on Teaching and Learning

As the Ennis project is so big in size, there has been a very large range of project activities covering a wide range of school types. A brief consideration of some of these may help illustrate the changes that have started to happen in teaching and learning across the project schools:

Multimedia User Group — Special Education

St. Clare's school is a special school for pupils with moderate/severe special needs. Teachers in the junior classes have used ICT to enhance the teaching of oral language for pupils with severely delayed language development. Teachers are using the digital camera along with the authoring package *HyperStudio* to make individual software programmes for children — an activity that backs-up the type of language work already carried on at the school. Certain children are more attracted by the multimedia elements integral to this method of teaching and are responding very well to the approach. As a consequence, a number of parents have requested training on the software so that they can continue working with their children at home. A user group has now emerged which contains parents and staff from the various resource classes in the town.

Bóthar — Development Education

In Holy Family Junior School a First Class group carried out a project that involved sending a goat to a developing country. This proved to be a very effective integrated project involving Civics, Geography, Religion and English. In working on the project, the children had the opportunity to develop socially and educationally and also to use their ICT skills. Team spirit and co-operation were important elements for the children. An appreciation of distance and place was also developed. The children learnt something about different cultures, something that is particularly relevant to Ennis with the recent influx of different nationalities to the town.

As part of their work, the children used email to communicate with the Bóthar organisation and learnt about the project on the Internet at http://www.bothar.ie. They were excited by the goat farm, which they visited in Co. Offaly. They then used *Microsoft Word* to write about their project and the digital camera and clip art were used to illustrate it. The end product is an excellent example of how these young children used ICT in a very natural way. Interestingly, the children talk about their project in terms of what they learnt about Africa and developing countries — not about its ICT elements. These seem 'invisible' to them!

Survive in Europe

Another activity that illustrates how using technology fits in very well with everyday schoolwork is the 'Survive in Europe' project at Scoil Chríost Rí. This included aspects of Geography, History, Art, SPHE and ICT. This project also involves mixed ability group work. The objective of the activity is to promote cultural links and communications with partner schools in Europe. The children used the Internet to research information, email to communicate with pen pals, Word to produce booklets and fact-files and the digital camera and scanner to incorporate images into their booklets.

These children have become so comfortable with the technologies that they are often to be found working on their *PowerPoint* presentations during break, and at other out-of-class times. They are interested in quality content and their use of the Internet and email is just an effective way to find out things and to communicate with their peers in Europe.

Local Relevance — Educational Value

Almost as a spin off of our SIP, we have produced a wide range of class project and lesson resources that could readily be used by other teachers in similar settings throughout the country. Our resources are particular to the Irish curriculum and illustrate some nice ways of integrating ICT with aspects of the Revised Curriculum.

Ironically, we now find it easier to incorporate ICT into our day-to-day work than to articulate how we are doing so! However, using the action research principles derived from recent NCTE-provided training, we are improving at reflecting on our experiences and — hopefully — this may result in case study and exemplar materials which will be of value to other teachers around the country.

Such autonomy is not confined to teachers alone: at this stage of our SIP it is heartening to see our pupils producing their own materials with less and less direct involvement from us, the teachers.

SIP — A Window on our World

Because of our status as the *eircom* Information Age Town, the town receives many visitors from home and abroad who come to see the effects on the town of having this abundance of technological equipment. Naturally, many who visit have a particular interest in education and they ask to see the effect ICT is having on our schools. We have received visitors from England, Denmark, Finland, Sweden, Holland and the United States to name but a few. Our pupils have gained great confidence from meeting and talking to these visitors and we believe that these opportunities have done much to increase the self-esteem of our students. As a result of one visit, one of our schools has begun work on a project with Danish, Norwegian and French partners which, if successful, will be broadened out to include other schools in the town.

As well as hosting visitors, our SIP has also been involved in a number of public presentations of our work in progress.

For instance, our students put on a very impressive display for the *Connected Communities* event last September and again met the public and talked about their work at the Ennis Schools Connected Dissemination Day in November. Project teachers have also played their part in this through an Ennis SIP presence at several international technology conferences. This included presenting an overview of our project at the *Global Connections Conference* in Phoenix, Arizona where we were one of six countries represented. More recently, at an ICT Conference in Germany we presented our project to a European audience. This conference examined the use of ICT within a constructivist approach to learning. This is the approach under-pinning many of the changes evident in the Revised Curriculum.

It was heartening to see how well so much of what we are doing within our SIP compared with what we saw and heard at these conferences.

Many more examples of topics and activities developed as part of our SIP are posted on our Web site. This can be accessed at http://www.sip.ie/sip058.

Future Challenges

Within SIP. . .

At this stage of our SIP, there are still areas that we feel we have not yet fully addressed, but which the coming months will allow time and opportunity to explore. For instance, we intend to move on the question of software evaluation as a matter of priority. We will also continue with our recent policy of using the more experienced teachers to assist colleagues in other schools in issues of basic network management.

However, the arrival of a *FirstClass*-powered intranet on the scene is probably what now interests teachers in project schools most of all. The *eircom* Information Age Town project has given us access to their server and has provided us with an administrator to train us on how to set up and administer on-line conferences using *FirstClass*. This training is now well under way and the administrator is working with a lead group of teachers which is setting up learning activities and buzz groups to allow pupils to communicate and collaborate with each other.

. . .and Beyond

It may seem strange to be thinking of what will happen beyond SIP when so much remains to be finished but we are keen to build on the work done to date and see forward planning as a necessary and proper part of this.

The process of integrating technology into the learning environment in our schools will take many years of exploration and research. We regard our work as an ongoing process. Already, there are signs that people see possibilities in ICT now, that may not have been visible to them previously. For example, we find ourselves wondering how ICT might assist in teaching and learning for students with dyslexia and hearing impairment. The possibilities opened up by straightforward, and ready access to a secure and safe *FirstClass* environment are also intriguing.

Closing Comment

Our SIP will never really be over until all primary school teachers in Ennis are comfortable and confident in using ICT to extend and develop the learning taking place — whether in networked rooms or using classroom technology.

But there are a number of early indications that we are well on our way to that point.

As recently as May 2000, a survey of teachers' attitudes to the working in the networked room suggested that many still regarded this as an 'extra' to their class work. The past few months have seen a remarkable shift in attitude however. This became particularly apparent as we prepared for our Dissemination Day in November 2000. Perhaps we simply became more conscious of the significance of what has happened to teaching and learning in our schools, and the role we — and our new found ICT abilities — were playing in these changes. The scale of change we are a part of could be seen unmistakeably in the work displayed by our students on the day.

As teachers we have been influenced and encouraged by each other through our SIP and as a result, we have grown professionally. However, our adaptations to new ICT-enhanced approaches in teaching and learning are important far beyond Ennis alone. All primary teachers in the country face similar challenges in the future as their schools invest increasingly in ICT and other new technologies.

The Ennis Primary Schools' SIP has been a learning experience for all of us involved, and we now realise that we are slowly getting to where we want to be, by walking together and sharing the road.

Appendix

The eight primary schools involved in the Ennis SIP are:

- Ennis National School
- Scoil Chriost Ri
- St. Anne's School (Mild learning difficulties)
- Holy Family Junior
- St. Clare's School (Moderate learning difficulties)
- Bunscoil na mBraithre
- Holy Family Senior
- Gaelscoil Mhicil Ciosog

Using ICT in the Leaving Certificate Applied Programme

Donal Whelan

Introduction

Our school has a long tradition — thanks to its Christian Brothers' origins — of having a particular regard for education relating to social equality. Consequently, over the years we have enthusiastically taken on board projects such as VPTP and the Leaving Certificate Applied. The Leaving Certificate Applied (LCA) is a two-year, alternative leaving certificate programme which has a strong vocational element and places considerable emphasis on preparation for the world of work. In general, many who opt for the LCA would be non-academically motivated and/or have a negative attitude to school and learning. A number would also have had disciplinary difficulties during their earlier progress through the system. Many would come from socio-economically disadvantaged backgrounds and would only stay on at school because of their parents' wishes.

We have also run a special class for students with severe learning difficulties for the past fifteen years. Such initiatives put great demands upon the teaching staff involved, but we at St. Joseph's CBS, Nenagh, pride ourselves on the commitment that we bring to our work for students in these areas.

The class of 1999 was our third LCA cycle. Some of us, who had taught all cycles and who had experienced the difficulties involved, felt that a new approach should be considered. Thanks to the active interest and encouragement of our Learning Support teacher, Ms Marie Whelan, we decided to make an application for SIP funding to test the efficacy of IT as a teaching tool for our Fifth Year LCA class in 1999. From our experiences with LCA classes we felt that ICT in general, and portable technology in particular, would benefit the boys. In particular, it would offer a different approach to taking a course which has a strong orientation towards the production and presentation of research work.

It was from this simple idea that *Using ICT to Teach General Subjects to an LCA Class* (SIP 053) emerged.

Framing Decisions

A number of conditions and decisions helped shape the project at the early stages. These included the fact that, for many of our students purchasing a home computer would not be an option. Much of what we planned therefore, revolved around getting enough portable technology in place to resource the entire classgroup. The equipment was of course only half of the equation — much depended also on getting high-quality, relevant software into place so that the technology could be used to full advantage. Initially, our plan was to examine the commercial software on the market for second level schools and evaluate its usefulness in the LCA context. As you will see later, we greatly modified this approach in light of the circumstances.

But it was perhaps the most daring of our early decisions which was to have the most defining impact on how our SIP eventually developed.

Marie Whelan had previously been involved in a VEC project called Mol an Óige — an initiative under the aegis of North Tipperary VEC which focused on retaining students in school, particularly at senior level. As part of that project, she had visited Wales to see the work being done at Ponty Pridd College in the Rhonda Valley. This is a 'second chance' college set up in an unemployment

blackspot where the coal mines had been shut down. It offered retraining to adults as well as second level courses, and it makes considerable use of computing as a teaching and learning tool within the vast majority of its programmes. We decided to take the whole group on a visit to Ponty Pridd so that the boys could see for themselves the way ICT was used at the college. Our hope was that this would act as an inspiration and a model for what we were about to attempt ourselves.

Early Stages

As a core group of three teachers, we prepared an application for SIP funding, drew up a detailed listing of what would be required to resource the project, and then sat back to wait for a decision from NCTE. Much to our delight our application was accepted with only one reservation: we did not get funding for the 0.5 teacher release that we had requested. We did, however, get enough to cover 0.25 of a teacher and this went some way towards helping implementing our project.

The initial stages were very difficult, especially because there was a long delay in acquiring the laptop computers. As we have been an *Apple* school from the earliest times — with a large investment in Apple-compatible software — we decided to acquire *i-Books* for the students.

Sourcing the equipment delayed things but also gave us time to work on or put in place other aspects of the project which were to prove useful.

Many of our teaching staff have completed NCTE Phases 1 and 2 ICT training, and were very favourably disposed to the introduction of IT as a classroom tool. We decided to run additional night classes for the teachers of LCA specifically, but left these open to other staff also. This helped increase both confidence and technical ability.

Another decision facilitated by the delayed start-up also turned out to be most auspicious. To involve the students' families in the project and to encourage the students to return to stay on in school, we decided to organise free Introduction to Computing classes for the parents and adult siblings of the yeargroup. The take up rate on this was gratifying — of a potential 29 parents, an average of 20 turned up each night of the course. (We decided on the strength of the interest shown to continue these classes this year. On our survey, word-processing and Internet usage were the preferred options for the next session.)

The Ponty Pridd Visit

We travelled to Ponty Pridd in February 2000 and visited the college to meet students and staff involved in a number of programmes there. This had a major impact on all of us and on the subsequent work of our SIP.

The boys were astounded by the workshop approach of the students. Course tutors, lecturers and teachers, working in conjunction with a small team of materials developers led by Mark Owen, devised comprehensive but straightforward worksheets in each area of study, using only a word-processing package. These were completed by students in their own time — by coming to computer laboratories, taking down the appropriate sheets from the shelves and working away at their own pace. Interestingly, the emphasis was on 'home-produced' teaching and learning materials because like us — only earlier — Ponty Pridd College had found commercial materials not adequately focused for their courses. In fact, apart from CAD packages in the engineering and technical graphics areas, the only program suite in use at the college is *Microsoft Office*. This is used very much in a 'content free' way — with the emphasis on building carefully graded, course-specific resources using these basic programs. Obviously, the staff there has greater technical back-up than would be available to a second level school in Ireland, and considerable office support in drafting programs and worksheets. However, the overall approach was one our students — and we ourselves — found interesting and impressive.

The trip also proved important due to its social aspect and the bonding effect it had on the group.

Arising from this visit, we arranged a weekend course back in Nenagh for the entire staff of St. Joseph's. This course was given by Mark Owen and Gareth Williams, Deputy Head of Ponty Pridd College. We found the experience was most informative in demonstrating effective methods of using ICT as a teaching and learning tool. Gareth William's tutorial on using *PowerPoint* was especially well received. In fact, using *PowerPoint* in conjunction with the data projector has since become a very important part of teaching the LCA for some teachers. There are two principal reasons why this is so: First, it allowed teachers to adapt material already prepared for OHP — and so served as a way of adding freshness to material whose quality had already been established in LCA classrooms. Second, it provided a demonstrable advantage to using IT in the classroom — the effect was clearly worthwhile, and so these teachers were prepared to make the extra effort involved in moving to the new technology.

The visit to Wales was a turning point for our SIP in another important sense. It confirmed what we had begun to suspect about needing to devise our own material for the LCA classes. At present, the DES provides a syllabus which contains guidelines for each subject. However, there are no textbooks aimed specifically at LCA. Consequently, a lot of extra work falls to the teacher who has to develop teaching based on the guidelines, direct research around LCA tasks, and oversee the pupils' work largely on an individual basis. Obviously, this was going to have a major influence on the uptake of ICT by the subject teachers. Some could be expected to manage this better than others, in the main because certain aspects of LCA are better suited to using ICT than others.

The SIP Difference

The core of the LCA course is the completion of seven tasks over two years. This requires a written or typed folder showing the aims, action plan and research carried out by the student in his area, such as social education, career choice, IT as a specialism, and so on. These tasks are assessed by external examiners who conduct an oral examination of the work prepared by the student. This interview can extend to ten minutes. In previous years, we had experienced frustration for students and teachers alike when bottlenecks occurred in the Computer room, as students all tried to print-off their work in the same few (last!) days.

That didn't happen with this group, however. Because each boy had his own laptop, they could work in their own room or at home, and by using our *AirPort* system (*Apple's* wireless network) they could print out their work from their own classroom.

Personal organisation skills are also something the LCA students often fall down on. But again, the laptops provided by our SIP helped greatly in this regard. Project students learned to organise themselves by creating desktop folders for their subject areas and saving their work. Most learned very early on the dangers of not saving work regularly! They became adept at inserting clip art, surfing the Net (not always for 'educational' material — at least, not what I would consider educational) and using drawing and painting programs to enhance their presentation. As many of them have major literacy problems, Spellchecker was a help.

The purchase of a digital video camera by the Transition Year group also opened up some interesting possibilities for the LCA class who have already used a digital still camera for their task folders. I hope to do some work in this area in the final term when the students have finished all their tasks and key assignments.

A Few Quibbles. . .

While our SIP has been as successful in all major aspects as we could ever have hoped, we had, however, a few unforeseen moments:

In my innocence, I envisaged myself, as SIP co-ordinator, sampling commercial software in my office during my vast amount of project time and selecting programs for trialling in the different subject areas. The reality was vastly different. While we did test many packages — and even used parts of some — we discovered early on that commercial software in general, did not suit our programme. So, while the teacher allocation of five hours per week initially seemed generous, in reality it was not adequate if the co-ordinator was to have time for materials development work. In reality, most of the project time went on assisting in the classroom, setting up data projectors, rescuing laptops from crashes, un-jamming printers, and so on.

Once the *i-Books* arrived, we observed a number of practices that gave us pause for thought. A major drawback was that our students' immediate response when they needed material was to 'surf the Net', rather than first exhausting other sources. For example, each laptop came with a two CD-ROM encyclopaedia from *World Book*. When the students tried these out initially, they enjoyed them — particularly the video clips. But we soon found they had to be constantly reminded to use their disks — or books from the library as a starting-point, rather than simply launching and surfing simply because it was possible to do so. Another disappointment for us was in the area of typing. Each computer had a copy of *Mavis Beacon* — the typing tutor, which the students were supposed to use for a short period each night to improve their keyboard skills. There was a very poor response to this, admittedly tedious, task. Despite this, they became reasonably quick with the two-finger method of typing.

Finally, I had hoped that we would be able to create a Web site earlier on in the project. However, with the delay in launch and the subsequent rush to get into the technology in all its classroom aspects — time just seemed to disappear on us. This remains an aim for the future however — and one that we are confident that we will in time achieve.

… and a High Point

Following the official launch of our SIP project by the Minister, Michael Woods, John Mallon of *Apple* Computers in Cork interviewed the boys at length. He was so impressed with their interest that he invited them to visit the Apple plant in Cork, which we duly did, fitting it in with a trip to the College of Commerce where the boys were given career information on PLC courses open to them in ICT and other areas.

Given what I have said earlier about the nature of the LCA intake and the low expectations many of these boys brought with them, it was wonderful to see them making genuine and interested enquiries about the production processes at Apple and to see some of them now contemplating further PLC training — thus raising their career targets to a higher plane than builder's labourer or handyman.

Impact on Teaching and Learning

Our SIP has had a number of what are likely to be lasting impacts on how we approach teaching and learning within the LCA at St. Joseph's. It has also impacted on how we approach the use of ICT in teaching and learning more generally across the school.

As the LCA course is predominantly task-oriented, access to personal computers helped greatly. Literacy was, and still is, a major problem for some of our boys. The laptops were used to take dictation or notes from the board. While this occupied the students for long periods, the nature of the LCA class is such that a lot of attention has to be given on a one-to one basis. We have found the integration of ICT into how we teach to be a good way of freeing-up teacher time for this purpose.

The Internet was used extensively in LCA classes — but not exclusively for educational purposes, it must be conceded. Using the carrot and stick approach we found that the boys would

concentrate upon their class work if they were rewarded with some discretionary time on the Internet now and again. This needed strict monitoring, but in general, they complied with the guidelines, which basically were: if you stray into an unsuitable site, close it immediately. The penalty for breaching this rule — losing the classgroup its Internet access for a week — had to be implemented only once, in the early days. A paper jam in the printer identified the culprit and peer pressure prevented any repetition of the offence. The level of student effort fostered by SIP is also likely to change opinions on the possibilities of LCA work.

Our SIP also helped the boys to develop their sense of responsibility. Each boy had to care for his own computer, ensuring it was charged for class and locked away in school any day he did not take it home. Despite some early reservations, there was minimal physical damage done to the equipment over the life of the project; one machine lost the cover of the CD drive, and only two machines had to be returned to Apple for major repairs to the operating system. Overall, the boys were very careful with their machines and they will be ready to be passed on to the next LCA class in September.

Of course, there were also a number of more sobering issues that our project helped to highlight. For instance, the experience of our SIP would suggest strongly that — nationally — the teacher allocation for schools teaching LCA needs to be increased, and that the question of introducing properly qualified teachers as classroom assistants needs also to be addressed. It was only after eighteen months of pleading that our Learning Resource teacher obtained some hours for a qualified teacher to work individually with one of the LCA class who is a Downs Syndrome child. The difference the additional help has made for him, albeit at this late stage, is already very noticeable. This illustrated for us the importance of having qualified help to take these extra hours.

The most radical impact of our SIP however must be the decision to become over the next few years, Ireland's first laptop-equipped school.

Over sixty students in our First Year classes have had laptops purchased for them by their parents in a venture initiated by our vice-principal and member of the LCA co-ordinating team, Tim Brophy. This was possible as a direct result of the publicity, which the school achieved from the SIP. These purchases are not the sole preserve of more affluent parents but are spread across the entire first year. The cost is being spread over the five-year term of school life, financed mainly by local Credit Union loans, with a guarantee that the laptops will be upgraded every three years at a reasonable rate. This scheme is in its infancy at present but will obviously benefit from the LCA experience, not least because a number of us teach both classgroups. Portable technology in the secondary schools is an area which requires a lot more research and testing if it is to be extended generally, but we have made what we feel is a significant start in that direction.

The Rest of SIP and Beyond

Overall, we are very satisfied with our participation in the SIP programme and would be keen to continue developing laptop-based ICT usage within our LCA programme. Unfortunately, we are only too aware that our school would not be in a position to finance laptops for a new class each year. The current First Year cohort (complete with laptops) will not be eligible for LCA for another four years. Consequently, the best compromise in the interim would be to pass on our existing supply of laptops to each Sixth Year class to use for one year.

We feel that a project such as our SIP could be replicated and would work elsewhere, subject to the following criteria:

1. Delivery of laptops by the September commencement of the programme,

2. The pupils involved being reasonably computer literate, as a minimum, prior to starting LCA,

3. A robust network with a school-based server is vital if work is to be transferable between students and teacher,

4. A majority of the staff involved feeling confident in their ICT ability to start the process — you learn as you go along, as with all the best teaching.

We would see the three major successes of our SIP project as:

*   raising the self-esteem and generating a feeling of achievement among LCA students,
*   retaining students in the education system who were otherwise likely to fall away,
*   removing the fear of failure for students who have too much experience of this already.

As mentioned earlier, many students who come into LCA do so because they have little academic motivation, having slipped through the net for one reason or another as they progressed through junior cycle. For most of them, this was the first time in their school life that they were objects of envy and stood out. Being known as 'the laptop class' had a very important effect on the boys and gave them a strong sense of being unique.

Most of these boys were coming into Fifth Year reluctantly and, in most cases, only because their parents were insisting on their remaining in school. We have had no drop-outs over this LCA programme to date: all of these boys left summer jobs paying in the region of £150 to £200 per week to return to school in September. LCA, as a course of study for such pupils, has great potential, not only as a preparation for work but also at a social level, improving their communication skills and general attitude — the main difficulty heretofore has been in convincing the boys that this is so.

The abilities of our LCA students ranges widely and, in general, their literacy levels are very poor. Most did not like to write anything because of their fear of failure. For these reasons, the LCA cohort often feel that that they are not really 'students' like their coevals whom they usually refer to as 'swots'. Yet this classgroup now use the laptop's Spellchecker (having been warned of its limitations) and ask, without inhibition, for guidance when they feel they need it. As their familiarity with the hardware increased, so did their confidence. They delighted in showing off to us how they could do things with programs or change their desktops to weird and wonderful pictures. The LCA boys are drawn from four different Junior Certificate classes, which did not do Transition Year. However, they bonded very quickly and from the outset supported one another with hardware problems such as printer or system crashes. The early trip to Wales was a great help in this regard. For nearly all of them, it was a first trip outside Ireland and a first stay in a hotel. Their attitude to learning improved when they saw the age mix in Ponty Pridd College — where students ranged in age from teenagers to senior citizens, all working at their computers and at their own pace.

This LCA course and SIP have played a major part in transforming the teaching and learning experience at St. Joseph's and as a staff we are grateful to have been part of the experiment. From a school developmental aspect, SIP has really transformed our ICT facilities — from a staff development perspective it has been equally successful. It is exactly twenty years since our present Vice-Principal took delivery of the first personal computer to reach Nenagh CBS — a Sinclair ZX80 with IK memory, to be followed by my Commodore PET with 16K! We have come a long way since then. Now our school has a full wireless network system covering the entire classroom area, plus a wide range of the latest computer technology, and a strategy to roll this gradually upwards throughout the school. We also have a much more confident staff who are open to the idea of using new technologies to everyone's advantage.

Closing Comment

LCA students generally have a high drop-out rate, as many of them acquire reasonably well-paid (in comparative terms) summer jobs and remain on or else enter into an apprenticeship with their summer employers.

This September we had a 100% return to school by the 15 students opting for LCA. The use of laptops, changes in teaching methods and raised self-esteem were, I believe, all contributory factors. The interest our work with i-Books generated has had a very favourable impact on all involved — both staff and students, but without the push generated by our SIP, none of this would have happened so soon, if at all.

Section 4:
Additional Material

The Schools Integration Project (SIP): Background and Early Development

Conor Galvin and Aidan Mulkeen

The Nature and Context of SIP

The Schools Integration Project (SIP) is a central feature of *Schools IT 2000* — the on-going drive to place information and communication technologies at the heart of the educational experience across the compulsory years of schooling in this country. The stated aim of SIP is 'to foster whole school development in relation to information and communication technology (ICT) integration' through the establishment of 'pilot projects' in a number of schools working 'in partnership with the education centres, the community, industry, businesses, and third level institutions' (NCTE, 1998).

The Project was announced in late 1997 as part of the *Schools IT 2000* initiative. Due to the prioritising of training under the Teaching Skills Initiative (TSI), which characterised much of the initial focus of the initiative, it was not until the early summer of 1998 that an invitation was issued to schools to bid for funding to undertake special projects involving ICT. These bids were made against a detailed and demanding (but transparent) set of selection criteria. Interest in SIP was such that it took a number of months to sort and select the projects for support. Consequently, it was April 1999 before SIP was formally launched. For most SIP schools, work, other than planning and preparation, could only then begin in earnest. For many, it would be September 1999 before their projects initialised.

A number of features which were to impact heavily on the future direction of the project became apparent early on: First, far more schools were to be involved in SIP than had originally been envisaged. Originally, forty SIP *schools* had been proposed — this has now become at least forty SIP *projects* involving well in excess of 200 schools. Clearly, this was to have profound implications for both the funding mechanisms and the levels of support required to help schools develop their SIP activities. Secondly, there had been a significant response from the business sector to calls for support of individual projects and lines of action within SIP. For many commentators this came as a considerable surprise. In the main, this response comprised large-party IT sector support for projects which in some way or other dovetailed with their own development agendas. However, a good deal of more small-scale, local support was also evident. And thirdly, the range of proposed activities was immense and the levels of ICT skills and understandings that schools brought to the SIP arena was equally disparate. This was to prove a significant logistical challenge for all concerned with the support of the Project.

In brief, by the spring of 2000, SIP had come to consist of 57 separate and highly diverse school-level projects, each of which was intended in some way to test-out or develop ICT applications, pedagogies and/or resources that may have particular relevance to the Irish context. These projects involved anything from one to a dozen schools; and covered a bewildering range of topics, activities and intended outcomes. They were also very different in the nature and detail of the support and assistance they required from the core SIP staff at NCTE and from the ICT Advisors then being appointed to Education Centres up and down the country.

For convenience, SIP activities can be grouped under six general headings: Science/Mathematics, Humanities/Languages, Culture and the Arts, Special Education, Technical/Internet, and 'other' — a category which includes a number of highly ambitious public-private partnership projects, as well as work on developing ICT in relation to career guidance and counselling.

The National Centre for Technology in Education (NCTE) oversees SIP and has been responsible for the selection, resourcing and support of the projects. Precise mechanisms for the formal evaluation of the project are still under consideration. However, this and the dissemination of results/outcomes will likely rest also with the Centre. It may finally be worth noting that the scale of the SIP enterprise makes it one of the largest, nationally co-ordinated, school-level ICT initiatives currently taking place in Europe.

Snapshots from the SIP World

There are no 'typical' SIP projects. Each is a unique amalgam of people and places, of interests and abilities and each will have its own full and unique story to tell in time. Nevertheless, it may help to understand SIP better, if we consider the experience to date of two specific projects. These projects are very different in their aim, focus and rationale but offer a number of useful insights into the development of SIPs and the sorts of difficulties that SIPs invariably face. It is hoped that, in this way, a better understanding of the principal issues and challenges SIP schools have encountered can be brought to the more widely-cast discussion of the national SIP experience which follows.

The *Classroom of Tomorrow* SIP

This project has its origins in a pre-existing IT project of the same name and seeks to develop further earlier work on the impact of broadband technologies in education. In particular, it concerns the likely impact on teaching and learning, across a range of very different schools, of readily available robust network facilities, email activity and video-conferencing. The project involves ten schools in all and is cross-phase — that is, it involves both primary and second-level schools. It is led and co-ordinated by Pobalscoil Neasáin, Baldoyle, Co. Dublin. Most of the participating schools are in the greater Dublin area although Coolderry Central School, Birr, Co. Offaly figures among the primary school partners and Presentation Secondary School, Limerick among the second-level.[1]

On the second-level side, much of the technical aspect of the project involves testing out the uses of continuous broadband Internet access, and the resolution of difficulties relating to broadband video-conferencing on low-end machines. The project's curriculum focus is mostly on enabling teachers to utilise ICT for collaboration and to exploit existing Web-based resources as an integral yet transparent component of their teaching strategies. The subject teachers have concentrated on developing transferable resources (both paper and e-based) relating to junior Science, French, History and Geography.

On the primary side, the technical focus is more firmly on the usage of video-conferencing between participating schools. The primary curriculum focus is — unsurprisingly — more theme/activity than subject directed, with the preparation and exchange of information on the schools' artwork, poetry and nature tables providing a nexus for much of this work. An emphasis is placed on the replicability of project outcomes in other schools and as such, capital expenditure has been kept to a minimum.

Progress to date is seen by the project co-ordinator as encouraging, though not without its difficulties, and the learning gains as impressive. For instance, there is increasing evidence among the students at the lead school of what the co-ordinator terms 'higher order thinking skills' and 'opportunistic learning'. This relates in the main to the real-life application of ICT skills such as the current Fifth Year's work on preparing slide presentations. These ICT-connected challenges are felt to give rise to increased self-esteem and confidence — important attributes in an education setting where a sizeable number of pupils come from a disadvantaged background. Other reported examples of progress include a marked upswing in the number of teachers using the schools' IT

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1   For more information on project aims, participating schools etc., see http://www.sip.ie/

facilities, albeit in the main for reasons such as email and materials sourcing on the Net. Pupils are also starting to access email facilities more readily and frequently across the project schools, to mail each other or in some cases to mail their parents; this is still at an early stage of evolution but is seen as a positive development by the co-ordinator.

Evaluation is built into the day-to-day aspects of the project. Questionnaires are regularly completed by participating schools and fed through the co-ordinator to an outside group who have agreed to act as independent evaluators of the SIP. Replicability is seen to be both possible and desirable by those involved and continuity is not seen as a major issue — at least at the lead school. However, there will need to be a degree of re-alignment when the principal commercial partner withdraws from the project this summer (in line with their original intention), and aspects of the funding arrangements will most likely need to be renegotiated with NCTE if the project is to deliver on certain of the more ambitious elements of its remit.

The *Primary Science and ICT* SIP (Celbridge)

This project originally involved four schools using ICT in the incorporation of Science in the primary curriculum. However, the Celbridge school — geographically separated from the rest of the project cluster — has effectively operated alone. As an all-girls school with an entirely female staff and a 'low technology' culture, the school sought to find a single unifying theme involving all classes in a coherent whole-school project. The proposed introduction of Science formally into the primary school curriculum provided this. With the launch of SIP, a predominantly ICT-based approach was felt to be both appropriate and achievable.

The notion of 'The Green School' formed the basis for planning the curriculum aspects of the project. The staff met as a whole and in small 'interest groups' to plan and prepare curriculum materials and teaching ideas. Basic IT training was provided by running an NCTE Phase 1 course in the school. In addition, the school is fortunate to have almost full-time IT support, as the IT co-ordinator is at present the resource teacher, by an accident of school demographics. On the technical side, much of the project work centres on a base unit — an MPC with scanner and a digital camera — and a mobile unit with a laptop and data projector. The mobile unit is scheduled to visit each class for one hour per week and is available on request outside of this roster. A second laptop is used extensively in classes by individuals or groups of pupils, and by teachers, to preview software and prepare material. A number of girls in Fifth and Sixth Class were taught to set up the laptop and projector. Nine Fifth Class girls are now available in groups of three to do this when required (by the less IT confident teachers). Interestingly, these 'IT helpers' were not chosen solely on the basis of technical skill, but are judged to be those most likely to benefit from the confidence this responsibility brings.

This whole school ICT project took 'litter' as its starting point. The work began with a questionnaire survey followed by an analysis of the litter generated from packed lunches. On a particular day, each class was asked one by one to empty the litter in their lunchboxes onto a tarpaulin in the playground. The rising mountain of waste was recorded with a digital camera, and the resulting pictures later put on display. The younger classes simply looked at the quantity of waste, while the older classes engaged in classification and analysis exercises, dividing the material into recyclable, re-usable, biodegradable etc.

After this initial whole-school activity, each class took on different follow-up Science topics. Junior Infants looked at food and decomposition, First Class looked at water and Fifth Class looked at light and water. The ICT work was integrated with other activities, including Art, 3D displays and actual experiments. After the priming period, there was initially some use of Science software in a whole-class teaching context at Fifth and Sixth class level. This is now spreading across the school range. While the Science software is judged as not suitable for teaching a topic *ab initio*, it is seen as useful for reinforcing topics that had been covered in other ways. In some cases the graphics and multimedia elements in the software facilitated the illustration of 'difficult' concepts in ways that would otherwise have been difficult, if not impossible. However, finding appropriate software is

reported to be time-consuming, and it is not always possible to find wholly suitable material, especially for the junior classes. The generation of such material is within the frame of the project but so far — because of time pressure — represents only a minor element of the work.

The project is already reporting some learning gains. There is a clear motivational benefit, as the pupils are enthusiastic about ICT. The digital camera proved particularly popular and useful. The whole-school nature of the project has also been a benefit, generating interest in Science. The use of some of the older pupils as ICT helpers has been beneficial in raising confidence and skill as well as providing a level of support for the less skilled teachers. One very positive development is the way the project is engaging increasing numbers of the school's teachers in ICT work, as witnessed by increased demand for access to the second laptop.

Sustaining progress to date and realising the full pedagogical potential of the mobile unit are seen as the major challenges now facing the project. With the advent of a new school year, the current IT support arrangements are likely to prove untenable and there are worries among the project team on this score.

Emerging Issues

As noted earlier, one of the outstanding features of SIP is the variety of aims, approaches, activities and experiences to be found at the level of the school. We hope that something of the flavour of this has been caught in the preceding section. As might be expected with innovative projects, there is a characteristic dynamism to be found at the sites described above and indeed at almost every site visited. Without making any claims to absolute comprehensiveness, we would suggest that there are a number of issues which emerged from considering the work taking place at the sites visited in terms of successes and difficulties. Two are particularly important: technicality versus sustainability, and replication.

Technicality v Sustainability

A significant number of SIP projects are 'high tech' focused, in the sense that they are primarily experiments in the technology infrastructure of the school. These projects include work on school networked solutions and intranets — such as that taking place at St Helen's SNS in Portmarnock, Co. Dublin, which is piloting a 'thin client' network or the Wired for Learning project at Blakestown, Co. Dublin, which involves primary and second level schools in using a sophisticated intranet structure to allow teachers, pupils and parents to communicate in new ways, sharing ideas and information, and holding private discussions where required. Other 'high tech' projects revolve around video-conferencing and wide-area networking — such as the West Cork Information Technology Network, which involves a consortium of 13 schools from across the entire West Cork region, or the *Classroom of Tomorrow* SIP outlined earlier.

A defining characteristic of these projects is their very heavy reliance on technical infrastructure and intervention into the teaching and learning activity. This requires a similarly high level of technical capability either through a SIP/ICT co-ordinator with high levels of technical skill or through access to a technician and/or technical support from a sponsor company. Many of these projects require very high levels of technical sophistication, and so have needed hours (and in some cases weeks) of technical work on the part of the SIP co-ordinator — work which the project team may not have foreseen or fully appreciated and which may even have proved a serious challenge to the viability of the project.

Indeed, technical support is a recurring issue across the majority of the sites visited, but particularly so at the 'high tech' sites. Where external support is needed, this is expensive. SIP funding can cushion this to a point but, in the longer term, call-out fees and technical service contracts may prove simply beyond the budgets of the vast majority of schools. Where the ICT co-ordinator is responsible, this is very time consuming and can take the co-ordinator's attention

from curricular challenges. Either way, there are issues of sustainability involved which need careful consideration. Failure to address this problem may — ironically — present the technical dimension of these projects as a disincentive to widespread adoption rather than a spur.

A second group of projects centre on relatively 'low tech' equipment, typically the familiar items such as laptops, data projectors and digital cameras. Such projects would include, for example, the type of work being done on *The Marine* SIP at Ballygunner, Co. Wexford, or on the *Primary Science and ICT* SIP at Celbridge. While these projects require a degree of training and familiarisation activities for teachers, the relative simplicity of the technology allows for faster induction and project initialisation. These projects have typically been able to focus more quickly on the curricular part of their task. In short, they have been engaging earlier with the pedagogical challenges of ICT usage within their chosen area. These may reasonably be characterised as the 'high teach' projects.

Where curricular work has begun in earnest on such projects, those visited report certain well rehearsed benefits: There is general agreement that there is a substantial motivational benefit, with pupils/students demonstrating enthusiasm for the technology. There is support for the notion that technology can facilitate the use of more authentic activities, and this authenticity is in itself a motivator which goes beyond interest in the technology per se. Some of the projects add considerably to our understanding of the development of more exploratory and self driven learning, and of meaningful group work. In addition, some use ICT to devise whole-school or cross curricular projects, which act as a hook for other curriculum content.

However, a number of less evident but valuable lessons are also emerging from this group of projects. For example, in terms of project vitality, much depended on the timing of funding and training. Schools work on a rhythm — a point not perhaps fully appreciated in the funding mechanisms for the project nationally. Even a small delay in the arrival of equipment can put back a project by an entire term. Nevertheless, once the technology is in place, and basic training done, the challenges are essentially pedagogic, rather than technical — a point which is clearly appreciated at SIP schools up and down the country. There is considerable evidence from the SIP sites visited, even this early, that valuable pedagogical and curricular (or cross curricular) work can be done with relatively straightforward technology. Data projectors, laptops and digital cameras seem particularly important in such projects.

Projects of both natures also have much to tell about sustainability. As the capital costs of these projects has been met by the SIP programme, the recurring cost is likely to be relatively small in the short term, and so it is likely that most of the schools visited could afford — in equipment terms — to continue to run the project after the funded period. With the 'high teach' projects, the limit to sustainability is likely to be the imagination to devise appropriate and novel activities which can engage pupils and teachers alike in ICT-enhanced teaching and learning activity. For example, while one cannot imagine running a whole-school litter theme project every year, it is certainly feasible that a range of similar projects could be developed, and repeated on a cycle over a period of years. Ripple effects from ICT usage in 'high teach' ways are also a very real possibility — for instance, there is no reason why primary Science lessons using laptops and data projectors could not spark interest in the teaching of other curriculum elements in a similar or related way at the schools involved. Indeed, there is some evidence to suggest that this is already happening at the Celbridge site. Similar spreading of 'high teach' usage has also been noted on The Marine SIP at Ballygunner, Co Waterford.

For the 'high tech' projects, the threat to sustainability is twofold and appreciably more significant: Firstly there is the question of the recurring capital cost on project equipment. At many of the sites visited, this is so high that it could not be renewed or replaced by the school without substantial external funding. Secondly, there is the issue of technical skills. Many of these 'high tech' projects rely on individual teachers with unusually high levels of ICT skills, and if they should leave (be promoted? win the Lotto?) it is questionable whether the schools would be able to continue to manage the technology. Innovation fatigue is also likely to figure in these settings in the longer

term: that it has not already started to do so in a major way reflects great credit on the teachers and schools involved.

Replication

Replication is perhaps the most important aspect of the dissemination strategy underlying *Schools IT 2000,* and as such, documenting and evaluating the SIP experience at the level of the school is very important. If the lessons, practices and materials emerging from the projects are to be spread effectively throughout the system as a whole, the SIP experience must be characterised by on-going, systematic recording, collating and analysis of information. Hard decisions will need to be made about what should be as well as what can be replicated and how best this agenda can be pursued. Comprehensive, critically informed documentation at school level offers the best leverage on this.

Unfortunately, our visits would suggest that this documentation is not happening within most projects and that there are a number of reasons why this may be so. First, the day-to-day practicalities of keeping a project operational are proving more onerous and far more time-consuming than many of the schools originally assumed or anticipated. A small number of projects — such as the *Control Technology: Empowering Minds* SIP which is supported by the developers of the project technology at MIT and locally by a College of Education[2] — have had external pedagogic and evaluative support, as well as specialist technical training. These have found the path much easier in a number of significant ways — not least of which is the time it frees up for evaluation activities and the expertise in relation to the same that it provides for the project. However, the majority of sites visited enjoy no such support and are able to devote little if any time to the process of documenting the development of their projects. Simply keeping the project on track ''consumes every minute'' in the words of one co-ordinator. Basically, most of the effort going into the SIPs at visit sites goes into getting the projects up and running and then trying to keep them there. Wear and tear on timescales relating to unforeseen technical difficulties and to indifferent and uninformed technical support would account for a worryingly large part of this effort. Every site visited has had some story to tell about difficulties concerning the cost, quality and accessibility of technical support, and about days, if not weeks, lost on the head of such difficulties. It is ironic that the documentation of most of this falls by the wayside as the schools spend so much precious SIP-time attempting to find practical solutions to these problems as they are encountered.

Another reason why schools may neglect the documentation of project developments seems to relate to a genuine lack of appreciation at the sites of the role and functions of evaluation — in either a project management or a research sense. Some elements of project management training have been made available to those who could attend NCTE sponsored workshops; but — if the site visits are any indication of the wider reality — the uptake on this was patchy and the follow-through often lacked conviction. SIP teachers were not convinced by the arguments put forward in support of project evaluation actions; or, if they were, found themselves in situations where such activities proved inoperative.

Additionally, the stop-start nature of affairs surrounding the early days of the project nationally helped cause a degree of uncertainty at many of the sites about what is involved in the planning of documentation and review activities. The suddenness with which events then began to unfold caught schools unprepared and unsure of what was expected in relation to systematic project evaluation. In a very understandable move, co-ordinators came quickly to focus on the 'priority areas' of drawing down funding, winning (and holding) support within the school staff for SIP-related activities, and 'accounting' for the project rather than compiling an account of it.

Early indications from the schools visited would also suggest that project type is likely to have a

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2   The project seeks to develop groupwork, problem solving and mechanical skills, as well as mathematical reasoning. See http://www.sip.ie/Project/?themeID=6#042 and Butler in this volume.

major influence on replication and replicability. The 'high teach' projects may prove more easily replicable as they involve a relatively small investment and are dependent — in the main — on tried and tested technology which can be handled with a little training. The focus they place on pedagogy and curriculum development may also offer outcomes that teachers elsewhere find attractive and worthwhile, as the professionalising nature of such developments may sit relatively easily with teachers and schools. On the other hand, the 'high tech' projects are both expensive and technologically ambitious. As such, they comprise valuable ICT flagship projects, but run a real risk of being seen only in those terms. What may be overlooked is that these projects could be replicated on a wide scale, but only with a very substantial increase in expenditure. Given the emergence of models of provision based on 'managed services' — such as the recent DENI initiative in Northern Ireland or a host of similar experiments in England and Wales — this is not completely out of the question.[3] Managed services involve this level of capital expenditure on infrastructure and hardware; not necessarily on the part of the government, however. It would involve a radical shift in thinking regarding ownership of an increasingly central feature of Ireland's education infrastructure, with political and ideological dimensions that would need careful resolution.

In short, the barriers to replication likely to face SIP would seem to be formidable. The cost of replicability is an issue with deep political and philosophical, as well as financial, import. But value for that investment is contingent on careful and informed decisions based on SIP outcomes — whether relating to 'high tech' or 'high teach' project outcomes. Regardless of project type, there is a need to convince SIP co-ordinators of the value of formative evaluation of project developments, and the functions of comprehensive documentation in this process. There is also a need to fund realistically the time, training and effort involved — from the local through to the national level. Projects may need to be offered extension funding if their progress to date has been severely hindered by technological failures or by lack of appropriate training and support at appropriate times. A number of SIP co-ordinators may need extension in their roles because their projects logistically could not begin before September 1999. The indications from sites visited are that if we do not find ways to do these things, we seriously risk losing the work invested to date in a considerable number of the project sites nation-wide. Investing in ensuring the full achievement of project aims by a maximum number of SIPs is likely to prove the key to the effective replication of the best features of the project nationally. In terms of the overall impact of SIP this will not be a cheap undertaking: it will, however, be a critical one.

Closing Comment

Some common themes and important lessons emerged from what was essentially a first-look at work in progress across a sizeable sample of the schools involved in the SIP initiative. Most of the projects started later than expected, and for reasons usually beyond their control. Many began their curricular work in the middle of the 1998–99 school year — but many others found they had to delay their start-ups until September 1999 or even later — and have had to work more intensely to achieve their goals in the shorter time-scale, or settle for achieving less than they had originally hoped. This is perhaps why, while most of the projects have done very substantial work, most are not yet in a position to consider the work complete — a fact which is certainly a source of disappointment and frustration at a number of the sites we visited.[4]

Most of the projects also seem to have found the work more time consuming, and more demanding than originally anticipated. Teacher time — or rather lack of it — is therefore likely to

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3   See McMullan (2000) for a detailed account of the DENI initiative.

4   This paper draws on visits to fourteen SIP projects, involving close to thirty schools in all, from across the range of geographical locations and technical interests covered by SIP. It is based on a similarly titled paper first read at the Education Studies Association of Ireland Annual Conference 2000. We would like to acknowledge the assistance of the following people who made site-visits in support of our research: Clare Brophy, Tom Nelson, Joan Brophy, Denis Treacy, Frances Doyle.

remain a significant block to sustainability even in 'high teach' settings. Planning, resourcing, managing and implementing change — on the scale that most SIPs are attempting — are time-expensive activities and one gets a sense from speaking with teachers on SIP sites that interest and early enthusiasm have carried many projects through their darker moments. Innovative projects require more energy, imagination and effort by teachers than might be imagined at first. Most projects underestimated the effort involved. Innovative projects also require a measured blend of support and training because training and staff development are important ingredients in ensuring project vitality and success. However, they are not the only part of the equation — the personal qualities of the co-ordinating teachers and, indeed, of all of the teachers actively involved with the work of 'their' SIPs in their schools — are also a key factor in project success. Innovative projects require creative, critically informed, optimistic and trenchant project people with a strong sense of what is possible and worth pursuing in their area. SIP has many such adherents from the school across to the national level. That is how the Schools Integration Project has begun to demonstrate that it is possible to do worthwhile curricular work with ICT in schools, despite the constraints of time and curriculum.

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SIP Symposium Programme

1 - 2 December 2000, Portmarnock, Co Dublin.

Friday, 1 December

12.00 -12.30	Registration

12.30 - 12.45	Welcoming Address:
	Jerome Morrisey, Director, NCTE

12.45 - 1.30	Keynote Address:
	'ICT in education - Making a difference?'
	Roger Blamire, Innovation Manager, EUN

1.30 - 2.30	Lunch

2.30 - 3.15

Presentation A	Presentation B	Presentation C	Presentation D	Presentation E
Dundalk Learning Network	Data Logging in Teaching Science	Comparative Social History: 1937 and1999	Technology in Music	Improving Literacy Among Adolescents with Learning Difficulties
John Rust	*Declan Kennedy*	*Sheila O'Sullivan*	*Catherine Frost*	
[Community Access]	[Data Logging at the Second Level]	[ICT as Learning Tools]	[Integrating Technology into Music Education]	*Archie Hinfey*
				[Special Needs Education]

3.15 - 4.00

Presentation F	Presentation G	Presentation H	Presentation I	Presentation J
The Ennis Primary Schools SIP Initiative	The Web as a Teaching and Learning Resource	The Use of ICT in Teaching Mathematics	Startech – Learning Together	Developing an Intra-net in a Post Primary Environment
Anne Walshe	*Heather Lawson*	*John Fahey*	*Michael Crowley*	*Ray O'Neill*
[Web Publishing in Education]	[www.glenrath.com]	*Seán O'Tuama*	[The West Cork Learning Network]	[Resourcing the Curriculum]
		[Enhancing Mathematics at Second Level]		

4.00 - 4.15	Coffee

4.15 - 5.45

Workshop K	Workshop L	Workshop M	Workshop N	Workshop O
Linking with EU ICT Projects	The Intel Teach to the Future Project	Evaluating your SIP: Some Suggestions	WebBoard	Better Web Pages
Dermot King	*Jim Enright*	*Adrian Keena*	*Ken Turner*	*Greg Gilligan*
Léargas	ICT Advisor, Laois	St Patrick's Boys NS, Castlebar	Cambridge University	NCTE

8.00	Mulled Wine Reception,
	followed by
	Christmas Dinner and Seasonal Entertainment

Saturday, 2 December

9.00 - 9.30	An overview of SIP including Project publications to date.
	Breeda Meleady and Adrienne Webb, Project Officers, SIP

9.30 - 11.00

Workshop P	Workshop Q	Workshop R	Workshop S	Workshop T
Using portable ICT Equipment in the Classroom	Schools IT Planning	Making Use of Local Setting in ICT Projects	Publishing Children's Work in a SIP Context	Making Good Use of ICT Peripherals
Tim Brophy & Josie Walsh	*Pat Seaver & Tom McFadden*	*Daithi McSweeney & Adrian Keena*	*John Burns & Michael Cremin*	*Helen O'Connell and Breeda Meleady*

11.00 - 11.30	Coffee

11.30 - 12.15

Presentation U	Presentation V	Presentation W	Presentation X	Presentation Y
Kilkenny Information Age SIP Initiative	Control Technology Empowering Minds	Field Fences of Sligo	Integrating English and ICT	Wired for Learning
Fiona Phelan	*Deirdre Butler*	*John Joe Gallagher*	*Denis Bates*	*John Tyrrell*
[City-wide ICT Initiatives]	[Programmable Lego in Primary Education]	[Primary/Secondary Heritage Study]	[ICT in Second Level English Teaching]	[Schools Information Management System]

12.15 – 1.00

Presentation AA	Presentation BB	Presentation CC	Presentation DD	Presentation EE
Dublin Inner-city Schools Computerisation (DISC) Project	The Use of ICT in Learning Support	The Use of ICT in Teaching Religious Education	Laptop Use in the Leaving Certificate Applied Programme	ICT & the Development of Language in a Cross-curricular Forum.
Riona Fitzgerald	*Paddy Carroll*	*Tom Gunning*	*Donal Whelan*	*Daithi Ó Murchu*
[Support Network for School Innovation]	[ICT in Primary Education]	[Supporting Change in RE Teaching Across a Number of Second Level Schools]	[Portable Technology]	[Multimedia in language teaching]

1.00 - 2.00	Lunch

2.00 - 3.00

Roundtable FF	Roundtable GG	Roundtable HH	Roundtable II	Roundtable JJ
Content	Policy	Integration	Professionality	Innovation
Jerome Morrissey *Brendan Tangney*	*Ruth Carmody* *Conor Galvin*	*Deirdre Butler* *Aidan Mulkeen*	*Seamus O'Cannain* *Janet Moody*	*Kyran Kennedy* *Bryn Holmes*

3.00 - 3.45	Closing Address:
	'Where does IT go from here…?'
	Conor Galvin, UCD

3.45	Close of Conference
	Seamus Knox, National Co-ordinator, SIP

4.00	Coffee