Title:
A critical evaluation of the Department of Education and Science's initiatives to integrate ICT into the Republic of Ireland's Primary School Curriculum.

Author: John Murray

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Institution: The Westminster Institute of Education at Oxford Brookes University.

Statement of Originality
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Abstract

This study examines recent initiatives in the Irish Republic to integrate ICT into the primary school system. The study includes an analysis of the social, political and educational background to past initiatives, both government and teacher-led, to make more use of ICT in the general school system over the past 30 years. The government's programme to train thousands of teachers in ICT skills is discussed, in terms of both the logistics of training so many people and in terms of what assumptions about ICT use lay behind what the teachers were taught. The structures put in place to support schools in making the most of computer and communications technology are analysed. The Scoilnet website is assessed and suggestions offered on possible ways to improve it. In addition, a national ICT pilot project is discussed in detail.

There can be no doubt that tremendous progress has been made both at the level of planning and implementation and of government policy with regard to ICT in education. However, it is argued here that a recurring flaw in various initiatives was that too little consideration was given to the pedagogical implications of ICT use. In addition, progress to date has been endangered by a failure to measure the effectiveness of ICT initiatives,

insufficient qualitative research and pressures on the education budget nationally.

Introduction

Ireland has witnessed momentous political, social and economic changes over the last thirty years. These changes have had an effect on educational policy. The huge investment in ICT in education has had far-reaching effects and there are signs of an increasing urgent need to reflect on what has occurred and what lessons can be drawn from the experience. I hope this study will contribute to the ongoing debate on this matter.

This work is a study of the development of ICT in Irish schools since the 1970's. It was not until the middle of that decade that the Department of Education began to take an interest in the use of computers in schools, and indeed nothing much was done at that time, not because of a lack of interest, but because of a lack of money: the high cost of computers and their maintenance at the time dimmed the government's enthusiasm for breaking with what was considered the tried and true method of teaching with chalk and blackboard. The enlightened teachers who pressed the government to act thought that the Minister for Education's initiative in organising in-service Summer holiday courses in basic computer science was a mere paternalistic nod of approval, as the teachers themselves had to pay for the

instruction; but, as will be shown, out of these courses sprang a long line of initiatives which revolutionised teaching in Ireland.

First there was the Computer Education Society of Ireland (CESI), which became a cornerstone in the drive to use microcomputers to the best advantage in the country's schools later on. There followed The Schools IT 2000 Initiative, based on a European Union Initiative whose goal was to ensure that pupils in every school in the state would have the opportunity to become computer literate; the National Centre for Technology in Education (NCTE), a body set up to implement the programme; the Schools Integration Project (SIP) which was seen as a project which would identify the optimal training and support models, classroom techniques and overall strategy for ICT adoption in Irish schools; the Department for Education and Science's ICT Policy Unit which supervises the NCTE; the Technology Integration Initiative (TII), set up to ensure that every school would have at least one multimedia computer with access to the Internet ; the National Centre for Technology in Education (NCTE) a support system for schools; a Teaching Skills Initiative (TSI); Scoilnet, a website resource for teachers, pupils and parents; full time ICT Advisors were employed in Teacher/Education Centres around the country to help teachers. All these initiatives are examined and evaluated in this study.

We have come a long way since the 1970's and 1980's, a dismal era in terms of the Irish economy. What follows is a detailed study of the history of the changes implemented since those early days. It is divided thus:

Chapter 1 is a brief history of ICT initiatives in primary curriculum integration in Ireland and an appraisal of them. Chapter 2 assesses the role of the education partners in ICT curricular integration in Irish Primary Education. Chapter 3 is an analysis and a critical evaluation of the Scoilnet website, an official site run by the NCTE and the Department for Education and Science, which has officially designated it as a 'portal for access to education information and a source of curriculum and training materials for teachers'. Chapter 4 is an analysis of the Schools Integration Project (SIP) as a catalyst for ICT Curricular Integration, a project which envisaged schools working closely with other social partners, such as Industry, small businesses, the voluntary sector, as well as sport and community groups. Chapter 5 is devoted to taking stock of the current situation as regards ICT in Irish schools. It attempts to gauge progress, to access the effectiveness of what is now taking place in the classrooms, and looks to the future.

In aiming at an evaluation of these initiatives which have had such an impact on Irish schools, I have drawn upon studies such as *Carroll's Sharing Innovative Practice: The NCTE's School Integration Project (Dublin 2000)*, which contains informative essays on the excellent work done with the help of computers in schools, such as John-Joe Gallagher's account of the project *The Fieldfences of County Sligo: An ICT Heritage Project*; and various official Department of education and Science documents, such as the *Blueprint for the Future of ICT in Education (2000)*; *Charting our Education Future (1997); Schools IT 2000-Summary (1999)*; *Submissions to the Information Society Steering Committee (1996)*. I have also drawn upon such European Union official publications such as *Learning in the Information Society, an Action Plan for a European Education initiative 1996-1998*, and *P. McKenna's New Information Technology in the Irish School System (1992)*. Of course, independent evaluations, if I may be so bold as to call them such, are also drawn upon and evaluated, notably Trinity College Dublin's Centre for Research in IT in Education's publication, ICT for Learning: an International Perspective on the Irish Initiative, by Freeman, Holmes and Tangney (2001). A full bibliography of the books and articles consulted by me is given at the end of this thesis.

There can be no doubt that tremendous progress has been made both at the level of planning and implementation of government policy with regard to ICT in education. But progress has been endangered by a failure to measure the effectiveness of ICT initiatives and by insufficient qualitative research and progress on the education budget nationally.

This study gives credit where it is due, and its critical evaluation of past and present initiatives may, I hope, be helpful to those who plan future government strategy in this field.

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I. The Background

I.1 The Political System

Ireland is a comparatively small European nation and the Republic has a population of approximately 3,750,000 people. Around 24 per cent of the population is under the age of 15. With almost a million people living in Dublin, the capital plays a major role on the economic and political life of the country. Given these conditions, the Irish educational system is a centralised and politically sensitive one.

The Minister for Education and Science is responsible to the Oireachtas (Upper and Lower Houses of Parliament, the Dail and the Seanad) for running the State's educational system and for devising and implementing educational policy. The Department of Education and Science provides the vast majority of current and capital funding for schools. The Department's budget for 2003 was approximately €4 billion.

I.2 The Educational System

Education is compulsory from 6 to 15 years and this age limit will soon be raised to 16. Indeed, the provision of primary education for all citizens is guaranteed under the Constitution.

Most children receive their primary education in the state-funded system of National Schools. Each school is run by a separate Board of Management, made up of representatives of parents, teachers and the local community. However, the schools receive the bulk of their funds from the State, which pays the teachers' salaries.

Most National Schools (Primary Schools) are denominational in nature, and National Schools are permitted to reflect the ethos of the religious grouping which runs them, be it Catholic, Church of Ireland, Jewish or Islamic. In recent years a number of schools have been set up as non-denominational institutions.

There are over 3,000 National Schools, with a total of 440,000 pupils (around half of all those in full-time education) and a staff of 21,850 full-time teachers. A National Inspectorate system is in place to ensure the curriculum is adhered to and standards are maintained.

Although there is continuous school-based assessment, there are no State-run examinations during schooling at Primary level, nor are there any examinations on leaving the Primary system.

Although, as has been noted, the Irish educational system is a highly centralised one, major initiatives in education are, in practice, developed through a lengthy period of consultation with interested parties, such as educationalists, teachers' unions, parents' groups and official bodies, such as the National Council for Curriculum and Assessment (NCCA) and the National Policy and Advisory Development Committee (NPADC). Indeed, the idea of social partnership has been seen by many to be a key factor in the Republic's recent economic success, as has the idea of reaching consensus in major economic, political and social projects, and is a particularly strong factor in Irish political culture. This is a far cry from the political atmosphere of the late 1970s and early 1980s, which was marked by ideological differences and mutually antagonistic jockeying between such group as employers and unions, industrial workers, farmers and so on.

There is, of course, as in all countries, still the sometimes vexed question of funding, and the Department of Finance also has a role to play in allocating funds to turn initiatives into reality.

I.3 The Economic Background

The Republic of Ireland in the 1980s had a very high level of national debt, a large public borrowing requirement, and little investment in infrastructure, chronically high unemployment and net emigration. In the 1990s, the State emerged as one of the fastest growing economies in the European Union. The average GDP growth rate between 1996 and 2000 was 9.24 per cent. Policy makers have placed a great emphasis on a skilled labour force as one of the factors, which contributed to the State's economic recovery. For a relatively small country, it is essential that outside investment is attracted and that the economy is export-driven. The government has estimated that there are over a thousand foreign-owned manufacturing or services companies in the Republic; since 1980 Ireland has attracted roughly 40 per cent of all US new inward investment in electronics in Europe and 25 per cent of all exports derive from the electronics sector. (DOEE, Facts about the Economy, p.11)

Education was one of the strands recognised by the Government as contributing to the future economic well-being of the State. In 1999, the Government introduced its Action Plan for the Information Society. Like many such documents, it is a mixture of aspiration, unfunded promises and

specific and funded policies. It is significant in that it showed a growing recognition by the authorities that schools could and should play a role in equipping the future work force for taking part in a society that would be affected by information technology.

More recently, the government has devised the National Development Plan for 2000 to 2006. Among the tasks the plan sets for itself is to deal with the State's infrastructure deficit, including transport and schools. However, the changed economic conditions since the May 2002 election have lead many to question where the funds to pay for the plan will come from in more difficult economic conditions.

I.4 The Social Partnership Model

An unusual aspect of Irish economic life is the concept of Social Partnership. Under this model, unions, employers and the Government negotiate national pay deals and back a variety of measures to combat social exclusion. The advantages of such a system are a reduction in days lost to industrial unrest, the facilitation of long-term planning once wage deals have been agreed and the fostering of a climate in which consensus is prized. It

also acts to moderate pay claims with the promise of tax reductions. However, some critics maintain that such a consensus model can act to stifle debate about the direction of economic policy. The first such deal was reached in 1987, with the three-year Programme for National Recovery. The programme has been followed by the Programme for Economic and Social Progress (1991-1993), the Programme for Competitiveness and Work (1994-1997), Partnership 2000 (1998-2000) and the Programme for Prosperity and Fairness (2000-2002).

The effect of these agreements has had a widespread effect on public policy in the State. When formulating policy, the Government is careful to take the opinions of the Social Partners (the unions, employers and charitable organisations and the voluntary sector generally) into account.

II. Early ICT Initiatives in the Republic

II.1 The 1970s - A Grassroots Support System

The use of computers in Irish education began in earnest in the 1970s. At that time computers were extremely expensive and way beyond the meagre budget of most schools. The Department of Education began organising in-service courses for post-primary teachers in 1971. These courses took place during the Summer holidays. In 1973 teachers with an interest in education and computing formed the Computer Education Society of Ireland (CESI). This support group for teachers is still offering support to teachers who have an interest in ICT and education. By the time microcomputers had become more affordable in the 1980s, the support base of a network of teachers and educationalists interested in ICT had already been formed.

This was a crucial platform of expertise on which future work could be securely based. An American educationalist has noted that teachers

> "must have access to other people from whom they can learn, either experts who have already mastered the resource or a community of teacher-learners who pool their efforts and share their exploratory findings". (Becker 1994 p. 303).

In a pioneering report in 1992 for the European Commission Task Force on Human Resources, Education, Training and Youth, Peter McKenna noted the involvement of teachers "from every level of the education system" as well as Inspectors from the Department of Education and Science. (McKenna, p.29)

On a more formal basis, Trinity College Dublin (the University of Dublin) began a part-time Diploma in Computers in Education as early as 1973. This gave teachers the chance to acquire formal qualifications in IT and education. This course was replaced in 1977/78 by a part-time M.Sc. course and the diploma course then resumed in 1978/79.

II.2 The 1980s and early 1990s – Increasing Official Recognition

Throughout the 1980s and early 90s various other initiatives were launched to promote IT in education. IT courses for primary teachers began in 1984 and attracted large numbers of teachers. IT in-service training has been part of Education Centre programmes since 1980.

Many local initiatives sprang up and were run by and for interested teachers. Among many such projects, a report on the topic has noted, for example, that from

> "1982 to 1991 Blackrock Teachers' Centre ran 45 IT courses attended by a total of 736 teachers with an average of 20 hours per teacher. These courses covered word processing, logo". (McKenna, p.30).

Teacher/Education Centres are supported by the Department of Education and Science but had to charge course fees to cover the cost of courses. This is no longer the case.

The five colleges of education that train Primary teachers all provide courses in ICT to prospective teachers.

In the 70s, 80s, and early 90s there was little direct Government investment in IT in education, as the country was in economic difficulties and the Government had other more pressing priorities.

II.3 The Celtic Tiger Years

As has been noted earlier, the economic boom of the 90s led to the "Celtic Tiger", an unprecedented economic boom that saw the State's GDP rise from 70 per cent of the EU average in 1993 to over 115 per cent in 2001. During this period job creation in Ireland ran at six times the EU average (Eurostat: pp.15, 21).

In the late 90s the use of ICT in Irish education became a government priority. In an official statement of national economic and social priorities, the Fianna Fáil/Progressive Democrat Coalition Government committed itself to integrating information technology throughout the school system. (Action Programme for the New Millennium: p.21*)*

The aim was a laudable and pragmatic one, and much political and economic capital has been devoted to achieving this aim. The evidence of political will to aid change is encouraging. Without leadership on a national

level, there will be resistance to what some inevitably will perceive as a threat to their established `turf' and the status quo.

Yet initiatives alone do not guarantee lasting change. An American academic has described "innovation overload" as a problem bedevilling many sincere but poorly thought-out schemes to improve education. He writes:

> "…the main problem is not the absence of innovation in schools, but rather the presence of too many disconnected, episodic, fragmented and episodically adorned projects". (Fullan, p.21)

Whether ICT investment can be characterised as having an overall strategy or can be seen as merely as a series of hasty initiatives, stop-go measures and windfall spending will be discussed at a later stage in this analysis.

The Republic of Ireland, as has been noted, has witnessed extra-ordinary economic growth over the past ten years, and the Government has, until fiscal year 2002, found itself in the happy position of having vast amounts of surplus tax revenue to devote to areas that have been poorly funded, among them education.

In the Department of Education's submission to the Information Society Steering Committee (a partnership body composed of industry, unions and Government bodies), the report's compliers noted that an ICT strategy would ideally

> "be driven from the bottom through local pilot projects with inbuilt provision for national dissemination of successful outcomes. The key to success in these cases has been developing a sense of ownership among teachers." (DES 1996 p.4)

Although this document was not a policy document *per se*, it did reflect official thinking at the time. The submission also noted that delivering projects at a local level would be an appropriate method "to develop curricular IT skills and an appropriate classroom pedagogy for IT." (DES 1996 p.4) It is clear that government had already moved from a centralising idea of implementing IT change to one that depended on close contact with local schools.

The official discussion also made it clear that integration was to be a key objective of any plan.

> "The need to integrate technology into teaching and learning right across the curriculum is a major national challenge which must be met in the interests of Ireland's future economic well-being." (DES 1996 p.1)

More specifically the document also recommended that the government set up a national network to advise and support schools in using ICT. The report also makes specific reference to the concept of partnership. "The aim of this partnership approach, which will have a number of different strands, will be to enhance the effect of Government investment and to more effectively plan, fund and implement the integration of ICTs into education …A key dimension of that partnership will be the involvement of all the partners in education and the social partners". (DES 1996 p.4)

The report, clearly anticipating possible stumbling blocks along the way to devising a funding mechanism and strategy for ICT, avoided a technology- driven approach.

> "The dilemma for teachers in this new age of information is to ensure that technology is made adapt to learning rather that vice-versa. Thus the teacher may start with an educational problem and move to a solution which encompasses technology. Sadly, this process has often been reversed in the past" (DES 1996 p.29)

The report went on to moot the idea of a national ICT umbrella unit and the necessity for a system for training and supporting teachers in the use of ICT.

III. The Schools IT 2000 Project

III. 1 National and EU Developments

With the growing ubiquity of information technology and the growing realisation of its role in transforming the economy, the government began to examine seriously the issue of ICT in education. The government was also prompted by a European Union project, Learning in the Information Society, an Action Plan for a European Education Initiative 1996- 1998. The stated objective of the plan was to

> "accelerate schools' entry into the information society, to encourage widespread application of multimedia pedagogical practices and the forming of a critical mass of users, products and educational multimedia services, and to reinforce the European dimension of education and training with the tools of the information society." (EU 1996 p.4)

The main focus of the programme was to encourage EU member-states to get their schools connected to the Internet and, more specifically, to

engage schools in educational projects that transcended national borders. The project did much to make policy-makers in Ireland more aware of the potential of ICT as an educational tool.

In November 1997, the Schools IT 2000 project was launched. Within the space of three years, over €50 million of public funds had been spent on the project. The overall goal of the Schools IT 2000 Initiative was

> "to ensure that pupils in every school would have the opportunity to achieve computer and Internet literacy and to equip themselves for participation in the information society." (DofES 1996 p.27)

In 1998, the National Centre for Technology in Education (NCTE) was set up to implement the programme. The Department of Education's ICT Policy Unit acts as a supervisory body for the NCTE.

The Schools IT 2000 programme provided funds for schools to purchase ICT equipment, technical support for schools and, crucially, teacher training in the use of ICT.

Bull and his colleagues noted two crucial factors in realising the potential of ICT: adequate technical support and thorough and ongoing

instructional support. (Bull et al.1997) It is clear that these needs had been recognised in the Irish plan.

III. 2 Objective of Plan

Two key objectives, albeit somewhat nebulous ones, of the Schools IT 2000 Initiative were that schools would be equipped for the information age and that pupils would be comfortable in working with computers. In addition, there was a strong emphasis on training teachers to be more familiar with ICT as a teaching tool and enhancing the professional skills of teachers. This emphasis was enlightened and reflects the teaching unions' input, in part, into the programme.

III. 3 Technology Integration Initiative

The means by which these ambitious targets were to be met involved the creation of the Technology Integration Initiative (TII). In the first plank of this initiative was a commitment that every school would have, at the minimum, one multimedia computer with access to the Internet by the end of 1999. In addition, schools would be connected to the Internet. The second

part of the initiative was that the NCTE (National Centre for Technology in Education) would support schools in developing their ICT infrastructure. It was envisaged that by the end of 2001, a minimum of 60,000 multimedia computers would be in place in schools.

III.4 Teaching Skills Initiative

As regards training teachers to make the most of this new technology-rich environment, a Teaching Skills Initiative (TSI) was developed. There was an emphasis not just on training teachers to be familiar with ICT but, importantly, developing an awareness of the pedagogical basis for effective use of ICT. The teacher training programme will be discussed in detail in a later chapter.

III.5 Schools Support Initiative

This initiative consisted of two main strands, the Schools Integration Project (SIP) Initiative and the ScoilNet website. The SIP initiative, overseen by the NCTE, was a pilot programme originally intended for 40 schools. Eventually 361 schools, involving 71 projects, participated in this valuable initiative. The pilot projects were conducted in association with higher education, businesses, industries, the community and education

centres. The projects were highly imaginative and went a long way to ensuring schools were given a sense of ownership of the emerging project.

ScoilNet, an online resource for teachers and pupils was developed. This will be discussed in detail in a later chapter.

To oversee this ambitious programme, a dedicated unit within the Department of Education and Science, the ICT Policy Unit, was set up.

The NCTE was tasked with managing the implementation of the IT Schools 2000 Initiative and to provide policy advice to the Department.

Full-time ICT Advisors were assigned to the Teaching Centres around the country to train and support teachers and school principals. The role of these ICT Advisers will be discussed in detail later.

The government put up funding of €50 million for the project. (I have converted all punt figures to their euro equivalent.) In an unusual development, Telecom Eireann, which was then the State telecommunications monopoly, agreed in 1998 to invest approximately €18 million to ensure schools were connected to the Internet. This development would have been unthinkable without the social partnership model which had come to dominate official thinking by this time. Telecom Eireann would

in due course be privatised as Eircom, a company which was caught up in the downturn which hit Europe's telecom companies. The timing of Telecom Eireann's investment was indeed fortuitous. Perhaps Eircom's shareholders might not agree, but that is another story.

The National Policy and Advisory Development Committee (NPADC) was established by the government in 1998. It was made up of representatives of the social partners (employers, unions and assorted lobby groups) and was given the task of advising the Minister for Education and Science on ICT in Irish education, with a particular emphasis on future policy.

III.6 Audit

Given this unprecedented level of investment, it was essential that an audit be conducted to gauge whether the plan's ambitious targets were being met. In 1998 the NPADC decided to commission a national survey of ICT use in schools in order to accurately target further school funding initiatives. Price Waterhouse Cooper, a private-sector consultancy firm, successfully tendered for this contract. This report, and the results of other NCTE surveys, was published in 2001 (*The Impact of Schools IT 2000*) and a copy has been sent to every school in the country.

The report found that there are approximately 56,000 multimedia computers in Irish first and second-level schools – an increase of 65 per cent since 1998.

- This translates into an average of 8.7 computers per first-level school.
- Pupil : Computer ratios are 17.7 : 1 at primary level
- All schools had been provided with an Internet connection by early 1999.

In addition, some 8 per cent of primary schools had websites on which school details and student work were published. Professional development in ICT had been given to 20,000 teachers, an astonishing figure. (NPADC 2001)

As the purpose of this chapter is to give an overview of ICT initiatives, I will not go into the findings of the NPADC report on the pedagogical aspects of the programme, which I will discuss in a later chapter.

IV Blueprint for Future of ICT in Education

IV.1 Objectives

In December 2001 Minister for Education and Science, Dr. Michael Woods, TD, launched a new programme: Blueprint for the Future of ICT in Education. The plan will see an investment of circa €108m until the end of 2003. This investment will build upon the achievements to date.

The objectives and strategies of the new plan were:

- **€78.72m (£62m)** capital grant aid for first and second-level schools
- Priority for Special Needs students
- **€29.2m (£23m)** for support services including teacher training,
- The development of ICT school plans to meet individual school needs
- Locally based teacher training
- The development of Education Web resources
- A new scheme of innovative ICT projects
- Collaboration with other European countries

- Partnership with the social partners, with industry and with the broader community.
- Feedback from schools to determine future priorities (DES 2000 p.5)

The first phase of grants under the new initiative, some €25 million, were issued before the end of 2001 and a further grant was issued to all primary and second level schools, while the third phase will be made available during 2003.

In the foreword to the document, which set out this initiative, Dr. Woods, the then Minister for Education and Science wrote:

> "For the first time, principals and teachers will be given the opportunity to shape the way in which this extensive investment impacts on the schools by developing individual ICT Plans designed to meet the infrastructure and training needs of their particular students." (DES 2000 p.3)

The Minister's plan was ambitious and expensive and aimed to provide all schools in the Republic with:

- State-of-the-art infrastructure
- Leading-edge hardware and software
- Extensive training and support for principals and teachers
- A significant reduction in the pupil to computer ratio

- Broadened ICT curriculum integration

IV.2 Funding

This radical initiative provided the following funds to primary schools:

- Basic grant of €1,905 (£1,500) plus €19.05 (£15) per pupil
- Additional €95 (£75) per pupil in respect of all pupils in special classes
- Resource and learning support teachers (primary) receive a grant of €635 (£500) per allocated post

As this was a capitation grant, the greater the number of pupils in a particular school, the more money it received. A Primary School with 200 pupils will have received €5,700 in 2001, €5,700 in 2002 and will get another €5,700 in 2003. In total, a school of this size will receive €17,100.

In addition, schools may apply for funding under the Special Needs Fund (Primary) which caters for the particular ICT needs of pupils with special educational needs.

Schools received two tranches of such grants and, following feedback received from schools in 2002, will receive one further grant in 2003.

The installation of electrical wiring, as opposed to network cabling, is not covered by this grant. Schools should apply to the DES Minor Works Fund in order to source funds for benching and wiring. This is in my opinion a major drawback, as wiring is very expensive and the DES Minor Works Fund amounts to a paltry sum in most schools.

IV.3 Further Developments

In May 2002, each of the 20 ICT Advisors conducted ICT Planning Seminars for Principals of Primary Schools. These seminars were primarily to introduce the ICT Planning and Advice for Schools Pack 2002**.**

The 'pack' consists of three discreet components:

ICT Planning

The ICT planning section centers on the planning matrix. The matrix identifies outcomes of change at certain stages within a developmental framework. Schools can use it to ascertain their current stage of ICT development, plan their next move and monitor progress. The planning section also outlines the key areas to be considered during the ICT planning process and provides guidelines for writing an ICT plan.

ICT Case Studies

The case studies describe schools at different stages of ICT development. They are designed to highlight how schools can target their ICT funding most strategically and effectively.

ICT Advice Sheets

The ICT advice sheets provide information on ICT equipment, peripherals, networking and software. They are designed to be information resource for principals making ICT hardware purchases for their schools.

The main thrust of the current government plan can be summarised as follows:

Capital Provision

This funding is for hardware, software and networking in schools. It includes cabling, but significantly, does not cover wiring.

Internet access

When broadband Internet access is available, the mechanism of delivery to the classroom will, generally speaking, be via a network solution. Putting such an infrastructure in place will enable expanded access to the Internet

within the school.

The Scoilnet Website

The government intends that the use of the Scoilnet website as an educational portal, will lead to the development of interactive resources and other software usage, that will help integrate ICT into the school curriculum.

Teaching Skills Initiative (TSI)

The TSI initiative is ongoing, and the number of courses being offered is expanding. These and other topics will be discussed in later chapters.

Chapter 2

The Role of the Education Partners in ICT Curricular Integration, in Irish Primary Education.

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1. The Need for Change
2. Creating A Stable Climate for Change

II. Agents of Change

1. Delivering Training
2. Who Should Train the Teachers?
3. ICT Advisors
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I. Empowering Teachers

I.1 The Need for Change

One writer on the integration of computer technology into informed teaching practice has captured in an arresting, if somewhat dramatic, image the way in which computer technology can be relegated if thought has not been applied to how it will be used. Mary Burns was reminded of nothing less than a morgue where

> "computer use was limited to some skill-and-drill software. Indeed, the defining image of technology was that of the corpse: computers, still and silent, covered by sheets". (Burns, p.296)

The point is telling and reminds us how what are touted as marvellous technological resources for teachers and pupils can become a nuisance, a source of anxiety or draped and dust-gathering reminders of long-forgotten promises of improvements.

In some ways, such a situation prevailed in the Republic of Ireland before the massive investment in ICT successive governments have committed themselves to. This is not to suggest there were not pockets of

excellence in the harnessing of ICT's potential in education. However, such local efforts did not amount to a national strategy.

I.2 Creating A Stable Climate for Change

To create long-term and strategic change, short-term flurries of innovations are seldom effective. To ensure that teachers are given the best conditions in which to learn, a careful and planned environment is essential. As one writer, in an article on giving teachers meaningful input and a sense of ownership of a process of agreed change, has noted:

> "Much as proponents of change enjoy metaphors of white-water rafting and turbulence, most classroom teachers require something quite different … classrooms are more likely to change when there is a degree of stability." (McKenzie, p.27)

Stability can be much easier to achieve, in a highly centralised educational system such as Ireland's, if there is a clear commitment on the part of the authorities to create a fully worked out programme of reform. Sabatier and Mazmanian (1979) suggest a number of hallmarks that can serve as reasonably reliable predictors whether a policy initiative will succeed or fail, that is to say whether it will or not be integrated and institutionalised. Their observations were focused on politics per se but their insights are applicable to the politics of education. They include

having a worked-out theoretical basis for the policy, an unambiguous policy directive, informed implementers, active support from the policy framers, and an on-going manifestation of the high priority placed on it by those who recommend the change. (Sabatier and Mazmanian 1979 p.483) ICT Advisors working in Teacher/Education Centres implement ICT policy, but unfortunately do not always have an input into the formulation of such policies. Of course, politicians like to be associated with success and an effective policy is likely to attract many influential "patrons" to champion the process over time.

It is imperative that any reform of ICT in education involves all the stakeholders. The reformist agendas of a huge bureaucracy can seem distant to those who may have valuable experience and practical suggestions, but who are expected to adopt new techniques quickly. By means of pilot projects, such as the development of the document entitled, *ICT Guidelines-Primary* and the NCTE Technology Integration Initiative (TII), teachers were able to develop a sense of ownership, or more accurately a sense of being partners in change, in the development of broader ICT initiative in Irish schools.

It is essential that initiatives should not be over ambitious or they may fail. This makes for a fairly small project, but the risk is that the success of such a task is seen as an end in itself and the bigger picture is ignored, while political will or resources dwindle. Incremental improvements are welcome, of course, but are not always the stuff of deep shifts in approach. With a small investment the stakes are much lower for everyone involved and there is less of a will to overcome obstacles that any ambitious strategy invariably involves.

II. Agents of Change

II.1 Delivering Training

The Schools IT 2000 Initiative, which included the NCTE Teaching Skills Initiative (TII), involved putting 60,000 computers into schools. This has been completed and teachers are happy to give up a week of their Summer holidays in exchange for a school owned laptop, free Internet account and three days off during the academic year. The completion of this programme is quite an achievement when one considers that the Republic of Ireland has just over 40,000 teachers, which is roughly 10% of the UK total number of teachers.

Roger Frost in the *Guardian* on October 13th, 1998, was pleased with developments in Ireland, even at that early stage. He stated that:

> "If the UK wants a model of ICT training to hold up, it needs to look no further than Ireland. While the UK prepares to train its workforce, Ireland has already taken a cohort of 8,000 through the fist phase of its training plan." (Frost 1998 p.7)

He quotes Seonad Cook, the then NCTE Teaching Skills Initiative Project Officer:

> "We're consulting with as many people as we possibility can-the education centres, unions, universities curriculum council-to see what people need. And as far as subject teachers need, we're consulting with the Irish subject associations and doing research on what has happened in different countries. There's no point in reinventing the wheel and making mistakes that could be avoided". (Frost 1998, p.8)

There is no doubt that the NCTE initiative was and still is a bold and, for the most part, successful attempt to train teachers in the new technologies. But Roger Frost's article paints a rather rosy picture of the NCTE Teaching Skills Initiative. If this training initiative is to be used as a model for UK ICT teacher training, as Roger Frost proposes, then its shortcomings must be acknowledged and commented on. Lack of money has always been a problem. ICT Advisors who were involved in the early phases, often ran courses without enough software or manuals. To be fair these teething problems have now been resolved. These inefficiencies caused many problems but were eventually resolved in time. It must be emphasised that this was not the fault of the NCTE, as they were short of staff and resources and in fact did Trojan work to overcome these difficulties.

II.2 Who Should Train the Teachers?

Each Teacher/Education Centre, run under the auspices of the Department of Education and Science has a Director and administrative staff who runs a variety of courses for teachers during the academic year. It is the role of the ICT Advisor to support schools and teachers in promoting the objectives of the Department of Education and Science's Schools ICT 2000 policy within the implementation framework of the NCTE.

A crucial aspect of the strategy was to define the responsibilities of the regional ICT advisors, a process which mirrored what teachers would expect or hope for in such colleagues. Teachers were recruited to assist their colleagues in getting to grips with ICT. It is helpful for teachers to see that someone who has experienced the realities of teaching is the one whose job it is to help them either get to grips with the basics of ICT, or to help in realising more ambitious projects at schools.

Richard Ackerman notes that professional development programmes aimed at teachers in the United States

> "are increasingly moving away from presentations by experts and toward programs that involve administrators and teachers as facilitators of their own renewal and growth". (Ackerman 1996 p.22).

It is a pity that Prof Ackerman, in a slip of the pen in an otherwise fascinating and enlightening article, seems by implication to exclude teachers from the set of experts. Another American study found that teachers are the most effective trainers "because they are trusted by their colleagues to understand the realities of the classroom". (Foa 1996, p.1)

II.3 ICT Advisors

The official job description of the ICT Advisor is as follows:

"The ICT Advisor will carry out the following tasks with the guidance and support of the Education Centre, and the NCTE where appropriate:

- Plan and develop a programme of support for the Principals, ICT co-ordinating teachers and other teachers in their region, related to all aspects of the Schools IT 2000 project.

- Assist in the local management and organisation of all initiatives, and of the TSI and SIP in particular.

- Assist in the preparation and editing of appropriate resource materials to complement the Advisor's role, and the facilitation of workshops

and special interest groups who are involved in preparing such resources.

- Directly deliver training and demonstration of ICT applications when necessary.

- In conjunction with the Education Centre, build local data and information, as well as resource pools housed in Education Centres such as software libraries, which aid the implementation of the project.

- Help to create dynamic local support networks of Principals, ICT co-ordinating teachers, and teachers through the Education Centres. Assist other key players, including management groups and parents, in the development of support networks and in the interfacing of these networks with the teachers' groups where necessary.

- Work with other ICT Advisors and the NCTE to develop national support networks of Principals, ICT co-ordinating teachers, teachers and other key players including management groups and parents.

- Provide advice and disseminate information, directly and through support networks developed, to schools on all aspects of Schools IT 2000 and in conjunction with NCTE's information dissemination activities.

- Plan and co-ordinate the provision of technical support to schools where required.

- Promote participation of the social partners in the implementation of Schools IT 2000 on a local level through awareness raising, information dissemination and partnership building.

- Participate as required by the NCTE in the general development of the Schools IT 2000 project, providing information and feedback from the region to inform the national and local implementation.

- Monitor, review and contribute to formal evaluation of the different aspects of the implementation of the initiatives, in conjunction with the NCTE.

- Prepare periodic reports as required, and prepare and provide data concerning the ongoing work of the ICT advisory service as required." (NCTE, 2000).

It would seem that in framing the job description, the NCTE went to some pains to leave very little out and indeed the job is a busy one. Behind the Human Resources rhetoric, there can be discerned a view of the ICT Advisor as mentor, trainer, technical support technician, cheerleader and researcher.

With a teaching workforce truly comfortable with ICT and, equally as important, with ICT truly integrated into the curriculum, teachers themselves

would assume these roles. But to get to that perhaps utopian vision, teachers have to learn to walk before they can run.

II.4 A Partnership with Teachers

Richard Hall has succinctly put what many teachers know intuitively.

> "Giving students the big picture will enable them to see "what's in it for me", a crucial concept in motivating learning. By engaging with learners about the educational methods that underpin a course and by negotiating the course culture with them, the learning experience can become a holistic process with manageable outcomes." (Hall 2002 p.152)

In addition, where the learners are themselves teachers, it stands to reason that they should be given a clear idea of what the course is intended to accomplish and how the course will help in their profession. Such a process is never a one-way street, of course. On a practical basis, feedback from the learners serves to sharpen the content of the course and help ensure that the overall objectives are met.

On a broader point, an important part of the process was to ground the teaching of essential ICT skills in the experience, outlook and resources of the teachers themselves, rather than to adopt overly rigid formulae. The list of essential skills and overall course content was centrally planned, to be sure, but was itself developed through a process of debate, demand and lobbying that did involve the teachers and the wider educational

community. National politicians, local elected officials, professional bodies, think-tanks such as the Economic and Social Research Institute (ESRI), civil servants, opposition parties, pressure groups such as the National Parents' Council (NCP), academics, international bodies such as the OECD, and the unions such as the Irish National Teachers' Organisation (INTO), The Association of Secondary Teachers in Ireland (ASTI), The Teachers Union of Ireland (TUI), and even the European Union all contribute to the mix.

III. Hows and Whys of Training

III.1 Something for Everyone

It is all too easy to assume that the teachers all have a certain level of skill using even elementary computer programs. Such an assumption may lead those less comfortable with technology to feel uncomfortable or left behind in classes, so it essential that provision is made for all, regardless of their familiarity with technology. A supportive start may indeed be a "crucial factor" in a teacher's willingness to further explore ICT. (Bitner & Bitner, p. 96)

It is also important that teachers feel that they can express doubts or misgivings or even admit to a lack of enthusiasm. As an American scholar has noted:

> "The focus on initial commitment is misplaced. Deep understanding and commitment follow action; they do not precede it. As people gain experience in the improvement process and begin to see benefits, their enthusiasm for and commitment to the process are likely to increase". (Du Four 2003)

This is an important point to bear in mind. The process of training is in no way to seek "evangelists" for ICT or to fill teachers with a zeal. Rather it is to seek steady increments in skills and inculcate a sense of confidence; with that confidence can come ways to see ICT as a tool that can aid the teacher in a host of ways.

The following were the courses that helped teachers get to grips with ICT and to see how it could aid them in their professional lives.

Course Title	**Target Group**	**Duration (hours)**
ICT Introductory Course Phase 1 for Primary Teachers	Primary	20
ICT Introductory Course Phase 2 for Primary Teachers	Primary	20
ICT Introductory Course Phase 1 for Post Primary Teachers	Post Primary	20
ICT Introductory Course Phase 2 for Post Primary Teachers	Post Primary	20
The Internet	Primary/Post Primary	10
ICT and the Primary Curriculum	Primary	20
Intel Teach to the Future	Primary/Post Primary	30
Basic Troubleshooting for the Teacher	Primary/Post Primary	10
Multimedia Authoring	Primary/Post Primary	10
ICT & Special Needs – The Basics	Resource teachers for Special Needs/Teachers with Special Needs students in their class/Classroom assistants	20
ICT & Special Needs – Learning Support ICT & Special Needs-Mild	Learning Support teachers at both primary and post-primary levels (also mainstream teachers who have students with learning difficulties in their class and teachers who have a large number of disadvantaged students in their class)	20
ICT in the Teaching of Mathematics	Post Primary Mathematics Teachers	20
ICT and Guidance	Guidance Counsellors	20
Creating a School Website	Primary/Post Primary Teachers	10
Network Management	Primary/Post Primary Teachers	20

Teachers, like other learners, are more inclined to learn when training is linked to the reality of their situation as this makes the experience meaningful. A properly structured and arranged programme, with thought-out materials and with an adequate venue and timetabling, is more likely to occur in such a situation. The content of the overall programme should reflect the basic principles and overall goal of the wider initiative that inspired it.

Mehlinger identifies some principles adopted by a school in Michigan that greatly aided ICT integration. He says that technology should:

- increase student skills in problem solving
- thinking and analysis and organisation of information
- help students to become more at ease with technology and come to the realisation that technologies are just tools to help them in their study
- help students concentrate on using ICT as a tool to further their knowledge and to make learning a personal experience
- develop a learning process that is active and participatory.(Mehlinger 1997, p. A23)

These principles are equally applicable to the task of training teachers to make the most of ICT.

III.2 Something for Primary Teachers

This is not the place to list each and every detail of all the courses but it is useful, I believe, to single out a few of especial relevance to primary teachers. The Introductory Course Phase 1 for Primary Teachers lasted about 20 hours and aimed to develop confidence in the use ICT; introduce teachers to the potential of ICT; review the types of educational software available and their potential use in the classroom; introduce the Internet and e-mail. Fairly basic stuff, perhaps. But the very foundation of subsequent discoveries in ICT.

Phase 2 of the Introductory Course also took 20 hours to complete and built on the topics introduced in Introductory Course Phase 1, particularly in relation to word processing and computer hardware. It examined types of software, pedagogical aspects of computer software and software evaluation; introduced basic troubleshooting and computer maintenance techniques; and examined the use of the Internet and e-mail within an educational context. By this stage most teachers have increased in

their confidence in using ICT and display an increasing grasp of what the technology can offer.

The Internet course takes around 10 hours and explores what the Internet is and its potential within education and allow participants to browse and search the Internet, and save and print from it and explore issues such as Internet security, educational benefits, cost implications and protecting children against illegal and harmful uses of the Internet. It also introduces e-mail as a communications tool, examine its uses within the school and outlines how e-mail can enhance certain learning and communication activities.

The ICT and the Primary Curriculum Course specifically focuses over 20 hours on how ICT can assist in students learning language and literacy skills in English and Irish; early learning difficulties; science; email projects with other schools; and ICT resources for school planning and classroom management.

The Creating a School Website Course lasts around 10 hours and introduces how to create basic Web pages, the hallmarks of a successful school Web site, and how to make school Web pages available on the Internet. It is a course that provides extraordinary dividends for teachers and schools in that it is quite astonishing how pupils take ownership of the

process and drive a school website. A school website becomes a shared sense of pride for pupils, parents and teachers and is one the most tangible reflections of the ICT programme.

In January 2004, the NCTE began training tutors for new ICT courses including:

- Web Design and Development for Learning
- Intel Teach To The Future
- Digital Media
- Troubleshooting
- ICT & Special Educational Needs-Moderate/Profound
- Internet and Email for Learning

The NCTE continues to create new and updated courses to meet the educational demands of teachers and pupils.

III.3 Judging the Project's Effectiveness

Dr. Aidan Mulkeen, of the National University of Ireland at Maynooth, using data from a 1998 survey of ICT in all Irish schools and comparing it to statistics compiled in a second national survey in 2000, found National Centre for Technology in Education (NCTE) training was related to a marked rise in teachers reporting "some computer skill". In addition, those claiming "some Internet" skill had doubled. A very creditable 84 per cent of primary teachers reported having attended some ICT course. However, Dr. Mulkeen's study suggested that the comparatively brief essential skills courses, although apparently raising ICT skills among teachers, were not successful in leading to greater use of ICT within subject areas. (Mulkeen 2000a, pp. 2, 13)

More encouragingly, his analysis of survey data further revealed that primary schools where one or more teachers took the NCTE course aimed particularly at the integration of ICT into the curriculum, had "significantly higher scores for subject use than other schools". In addition, the data compiled from national surveys of Irish primary schools in 1998 and 2000 shows that, in schools where a teacher had completed or was in the process of completing a postgraduate course in ICT in education, there was

"significantly higher subject use scores than other schools". (Mulkeen 2000a, pp.6,7)

In relation to school variables in the use of ICT, Dr. Mulkeen's analysis of data has shown that the level of ICT usage had a correlation with significantly higher subject use scores for that school. (Mulkeen 2000a, p. 5)

On the subject of in-school ICT co-ordinators, Dr. Mulkeen also found that in primary schools, "the status of the ICT co-ordinator was significantly associated with subject-use score. Having a co-ordinator, having a designated post for the co-ordinator and having release time for the co-ordinator were all significantly related to increases in subject-use score." (Mulkeen 2000a, p.9)

IV. Towards More Effective Training

IV.1 The Local Level

One way of driving home the lessons of ICT training that has been suggested has been to focus much more on testing what participants are learning.

> "While compelling, participant reaction data should not be confused with participant learning data. Reactions tell us only part of what we need to know. However cleverly we collect participants' impressions and opinions, these data cannot answer the question: "What are the participants actually learning?" (Champion 2003)

Instead of relying of survey impressions fairly long after the fact of training, Champion suggests gauging trainees' learning "with a fun activity, such as a simulation, crossword puzzle, "50-words-or-less" quiz, or "three-minute paper,"." She continues, however, with the advice to

> "Avoid surprise ambushes. Before a program begins, let participants know their learning progress will be checked frequently." (Champion, 2003).

Champion's advice would perhaps be more suitably geared toward training employees of a multinational technology firm.

Perhaps she could expect a rather more robust response from the primary teachers of Waterford and Tipperary to a “fun” pop quiz, even if wasn’t an ambush.

On a more practical level, given Dr. Mulkeen’s research, which shows a correlation between use of ICT in teaching primary subjects and teachers who had taken a postgraduate degree in the area, it is worth considering ways of validating and recognising the time and effort teachers put in to ICT training. Linking ICT training to recognised professional qualifications might open the door to a keener involvement. If the ICT modules were linked to enhanced pay (a very long shot, admittedly, given the Government’s tough stance on public sector pay) it would almost certainly create a greater motivation.

However, such questions are mooted if there is not a greater effort at a national level to truly integrate ICT into the primary curriculum.

IV.2 The Bigger Picture

In some ways, the process of training up so many teachers in ICT essentials was most significant for the strategic debate that it generated, about the role of ICT in teaching and the message that it sent, that continuing professional development of teachers, was at last an ideal that would be pursued with vigour.

Stiffens has argued convincingly that to teach means not only giving someone a tool kit, but enlightening them as to how when and how to use those tools. (Stiffens, p.19) This is true to the extent only that some ideas for when and how to integrate technology can be suggested. But such are the variables facing teachers – the school's catchments area, the subject itself, the way ICT lends itself to the particular topic being covered, the particular strengths and weaknesses of a particular class and individuals in that class – that is problematic at the very least to suggest an overly prescriptive approach. In addition, such a prescriptive strategy ignores the creativity teachers can bring to integration of ICT. Given the ingredients and a knowledge of cookery techniques, it would dismay any chef to be told what to cook and when.

Yet although teachers should not be needlessly burdened with an overly rigid framework in which to introduce ICT into primary schools, there needs to be more strategic long term planning from the Government. There is little point in having thousands of teachers all trained up, with nowhere to go to practice those skills.

An OECD report, which examined three Irish primary and three post-primary schools, found that where good practice exists, "positive school leadership, the presence of an effective IT specialist and the availability of professional support and guidance have been important factors in its development". However, the report continues:

> "Given Ireland's late arrival on the ICT scene, it was inevitable that much of the career development activity under Schools IT2000 would focus initially on basic skills … it is important that future professional courses enable teachers to examine the potential of ICT for cross-curricular and subject-based ICT teaching and learning". (OECD, pp.6,7)

Interestingly, the absence of national examinations at the primary level is one of the factors the reports' authors suggest would lend itself to a more integrated use of ICT at primary rather than secondary level. (OECD, p8)

Chapter 3

An analysis of the Scoilnet website, as a portal for ICT integration, into the Irish Primary Curriculum.

1. A Portal for Education

1. An Official Website
2. A Reflection of Official Policy
3. A Website in Constant Development

II. Design Considerations

1. Technical Aspects
2. Organisational Aspects

III. Curricular Implications

1. A lost Opportunity
2. A Resource for Teachers, not Pupils
3. A Good Foundation
4. Steps to a Better Scoilnet

I. A Portal for Education

I.1 An Official Website

The Scoilnet website, http://www.scoilnet.ie, is an official site run by the NCTE, in collaboration with the Department of Education and Science, which has officially designated it as "a portal for access to educational information and a source of curriculum and training materials for teachers". (DES 2000 p.11) The website (the name is derived from the Irish word for school, *scoil*) was designed to contain: "Information, links, projects and initiatives for teachers, parents and children". (NCCA 2001: 55) In addition, the site itself spells out its commitment to ensuring "all learning materials are curriculum focused." (Scoilnet 2003) Designing, creating and maintaining such a web portal reflects an approach to ICT in general, in addition to underlying assumptions as to the use of ICT in education.

I.2 A Reflection of Official Policy

I will evaluate the Scoilnet website through the lens of its commitment to ICT integration in the primary curriculum. Other criteria will include:

- what assumptions are presented about the manner in which pupils use ICT,
- the assumptions made about the effective use of ICT,
- the structure of the site,
- the extent to which the scope and resources of the site are made clear,
- the degree of interactivity the site should offer,
- some design considerations, including the effective use of multimedia,
- and the extent to which the site reflects the Government's commitment to ICT in the primary curriculum.

I.3 A Website in Constant Development

The Scoilnet website is in the process of being redesigned and new content is being added each week. As the goals and overall structure of the site have now been long established, and are

available on the web, I will provide an analysis of these, referring to the criteria mentioned above.

Of course, new content is constantly being added. The site has been in existence for five years and represents a significant investment in ICT. In some ways, a successful website is similar to a thriving newspaper: the content will change from day to day, but the underlying design, outlook and style endures for a far longer time.

In endeavouring to cope with the expectations of the broad community it serves, the site must prevail over the challenges that face such a medium, such as what skills are needed to access the information, whether feedback is available, and whether an

adequately signposted route through the resources offered is available.

In addition to such crucial considerations, the key question regarding the site must be answered within the context of whether it promotes, supports and facilitates the use of ICT in the curriculum.

II Design Considerations

II.1 Technical Aspects

The links on the Scoilnet website are plentiful and reliable. Visitors to the site, including pupils, are invited to sift through large volumes of

information in different ways. Yet the site's lofty ambition to be all things for all audiences and learning groups is the site's downfall.

Such problems inherent to a web site are compounded given the broad and diverse target audiences of the Scoilnet web site. From a design angle, the site copes well with the problems of reaching such a diverse audience.

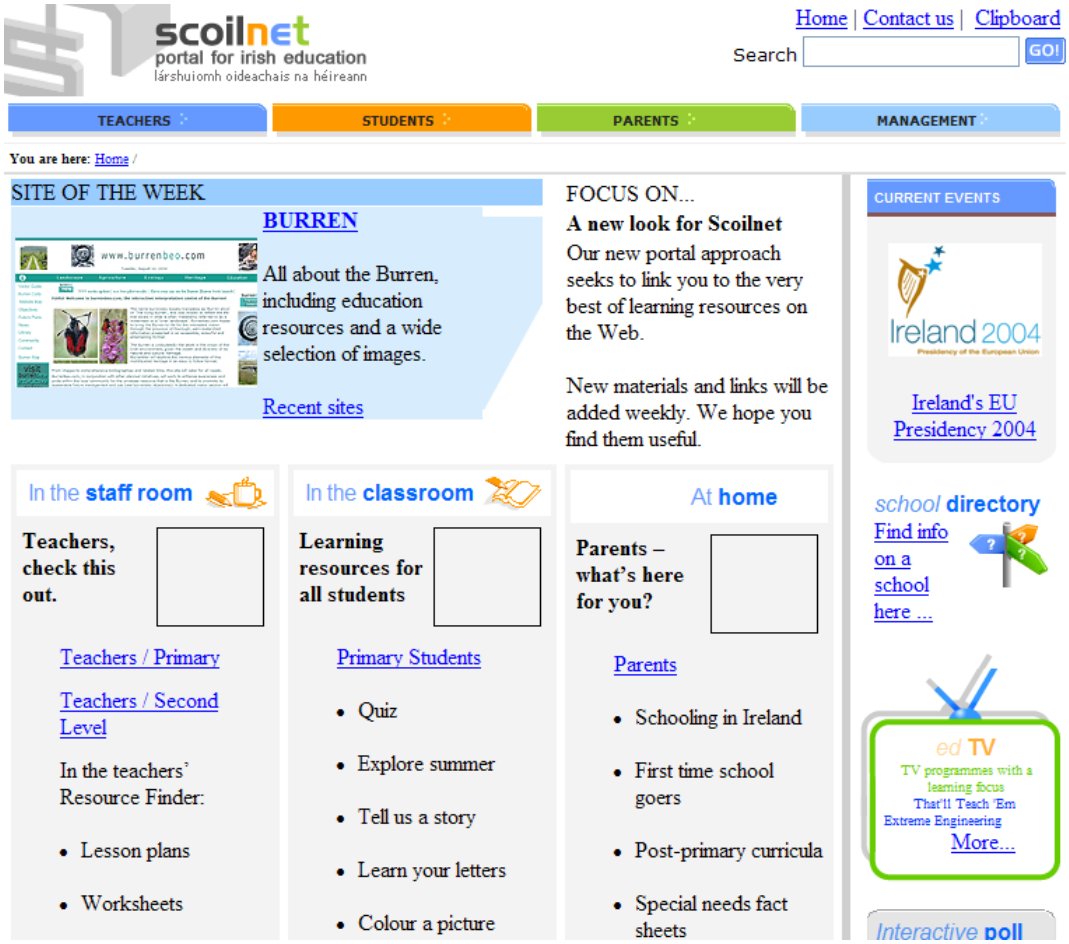
The site is relatively easy to navigate. Norman stresses the importance of design layouts being user friendly. Norman stresses that for a good design to optimise its potential, it should incorporate the following elements:

- Visibility
- Appropriate clues
- Feedback

Norman makes the point that:

> "visibility indicates the mapping between intended actions and actual operations. Visibility indicates crucial distinctions-so that we can tell salt and pepper shakers apart, for example … It is lack of visibility that makes so many computer devices so difficult to operate." (Norman p. 16)

Norman states that for visibility to be effective, the correct paths must be visible and they must convey the correct message. An overlap of links has been avoided on the Scoilnet web site in all its interfaces to date and reflects a welcome commitment to making the site easy to use.



Norman stresses that an excess of visibility makes objects difficult to use. There is a maxim in advertising that less is more, and there is no doubt that a cluttered web page makes it extremely difficult to navigate. On all the criteria Norman mentions above, the site acquits itself more than adequately.

The new Scoilnet website has a well-designed layout that adheres to principles of visibility and has an intuitive design interface that is appealing, visually informative and easy to navigate.

The Curriculum links are excellent and provide a table showing what each year group should be learning in subject areas according to the revised curriculum. This is solid information presented in a pleasing and detailed manner.

In terms of the criteria mentioned by Leland (Leland 1998), including authority and reliability of content, the site more than meets these. The site draws on the expertise of educators and curriculum experts. In terms of the elements mentioned by Heppell as indicative of good design, including appropriate use of images, a clear sense of the website's navigation, the use of simple icons, and reasonably efficient upload time, the site once again is effective. (Heppell 2000)

Web sites have evolved to the extent that certain design parameters have become almost engrained in users. The ubiquity of web sites and the hugely increased access to the Internet have ensured that people have an almost instinctive grasp of how to find their way around such a well-designed site.

II.2 Organisational Aspects

Understandably, such a broad target audience of parents, teachers, pupils and even media leads to dilution of effort. A recent Government White Paper on Education, *Charting our Education Future* (Department of Education 1995) laid great stress on the role played by parents in education and pledges the Government to promote the participation of parents at every level of the education process. What was intended on this site to be a resource reaching out to parents instead communicates a confusion as to the intended audience.

Yet the site does invite parents to help children explore material that is colourful and worthwhile. It is a pity that the material is not truly integrated into the curriculum.

There are copious links on the teacher section of the site but the links offered to parents are meagre. As an "outreach" attempt, it is commendable, if a little wanting in substance. The Special Needs links on the Parents

section of this site, contains information that is specially designed for parents. This is very helpful and is a very valuable resource.

In a site that is committed to providing a meaningful learning experience, the cues, clues and feedback offered assume a significance that is far greater for sites that provide other information. An educational website, therefore, involves more than just:

> "starting with a text and prettifying it, but rather of knowing how to combine various media to effectively communicate". (Shetzer and Warschauer 2001: 3)

The absence of audio media on the Scoilnet is deeply disappointing from a design point of view, but the NCTE intend to add this at a later stage in its 2005 Workplan.

Data presentation is not equivalent to knowledge construction and to creating cognitive links to existing knowledge. Preece, in a pioneering analysis of multimedia learning environments, makes the point that such formats suffer the same drawbacks as

> "other forms of discovery learning: that the lack of structure may not suit all students, every domain or all concepts." (Preece 1993: 143)

Such learning material, as Pachler puts it, should help users

> "to process information, engage them in abstract thinking, allow them to make the knowledge construction process transparent and help them create classificatory systems." (Pachler 1999: 11)

It must be admitted that such an analysis can lapse into the advice to designers and curriculum experts to "be perfect". That time-hallowed counsel of perfection is precise enough to be discouraging and vague enough to be unhelpful.

Overall, the site is well designed. What design faults there are in this thoughtfully constructed site relate to the relatively unadventurous use made of the potential offered by true multimedia content. The Minister of Education and Science intends to have Broadband Access in every Irish school within a two year period. It is essential that Scoilnet fully utilises this facility.

III Curricular Implications

III.1 A Lost Opportunity

The National Council for Curriculum and Assessment makes it quite clear that the use of ICT as an educational tool must transcend traditional notions of literacy. The *Teacher Guidelines* document states:

> "Appropriate web site activities should focus on integrating activities rather than on isolated drill and practice activities. Web based activities should involve as many areas of content and experience as possible. They should be thought of as a medium through which elements from the physical, cognitive, emotional and social domains are integrated." (NCAA 2001: 57)

As both the NCCA and Scoilnet are official Department of Education and Science bodies, it is important that the Scoilnet site complies with official curriculum guidelines. Yet the site does not support the integration of ICT in the curriculum in an effective manner.

At the time of writing this chapter (12th March 2004), the subject icon contained no material for some primary subject areas. I will comment on what was contained in the Irish language area and hope that it will become interactive. The curriculum support materials for Irish, for example, provided a lesson sample. It encouraged the teacher to concentrate on getting the children to speak Irish. Its main focus was on the use of everyday household objects as a springboard for exchanges between the

children, using Irish. It used visual cues to assist in promoting the communicative approach. The plan also consisted of some amusing songs, which reinforced phrases and expressions used in the main lesson.

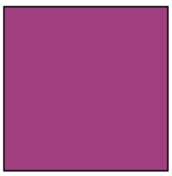
Yet the material was text-heavy. The poetry section had no voices reading poetry. The song section has no links to song or clips of singing, and so on. This was disappointing. The other subject areas had a similar text-heavy approach.

The NCTE intends to add an interactive dimension to this area and we look forward to seeing the completed work.

The Maths icon on the **Infants to 2nd Class** and **3rd to 6th Class section**, contains the same text-heavy material.

Click on the word that names the shape.

This is a

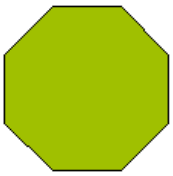


square

parallelogram

rectangle

This is an



hexagon

octagon

rectangle

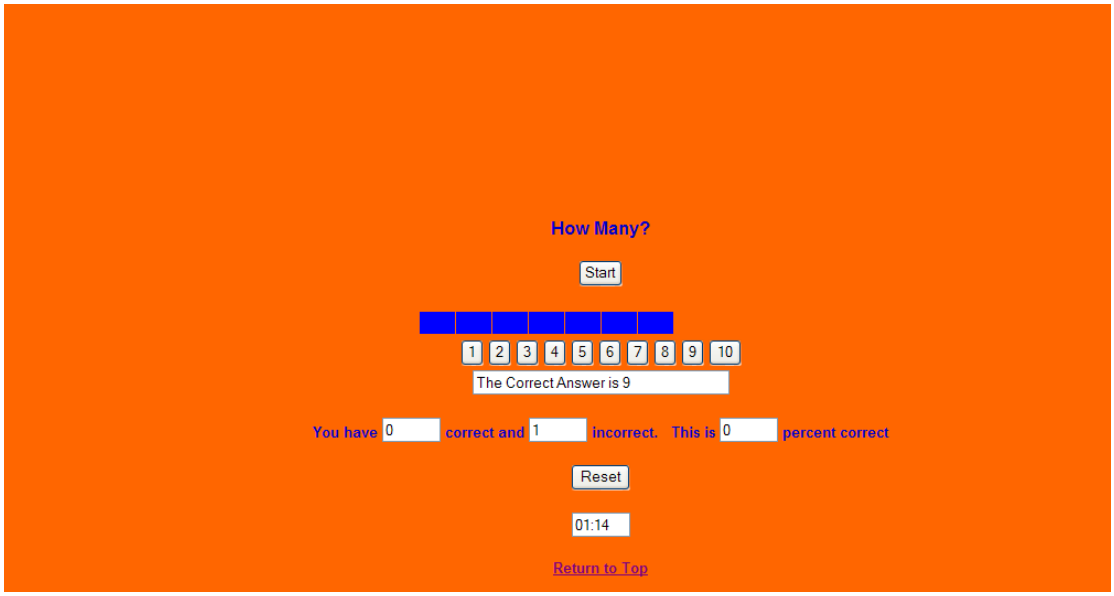
This is a

square

octagon

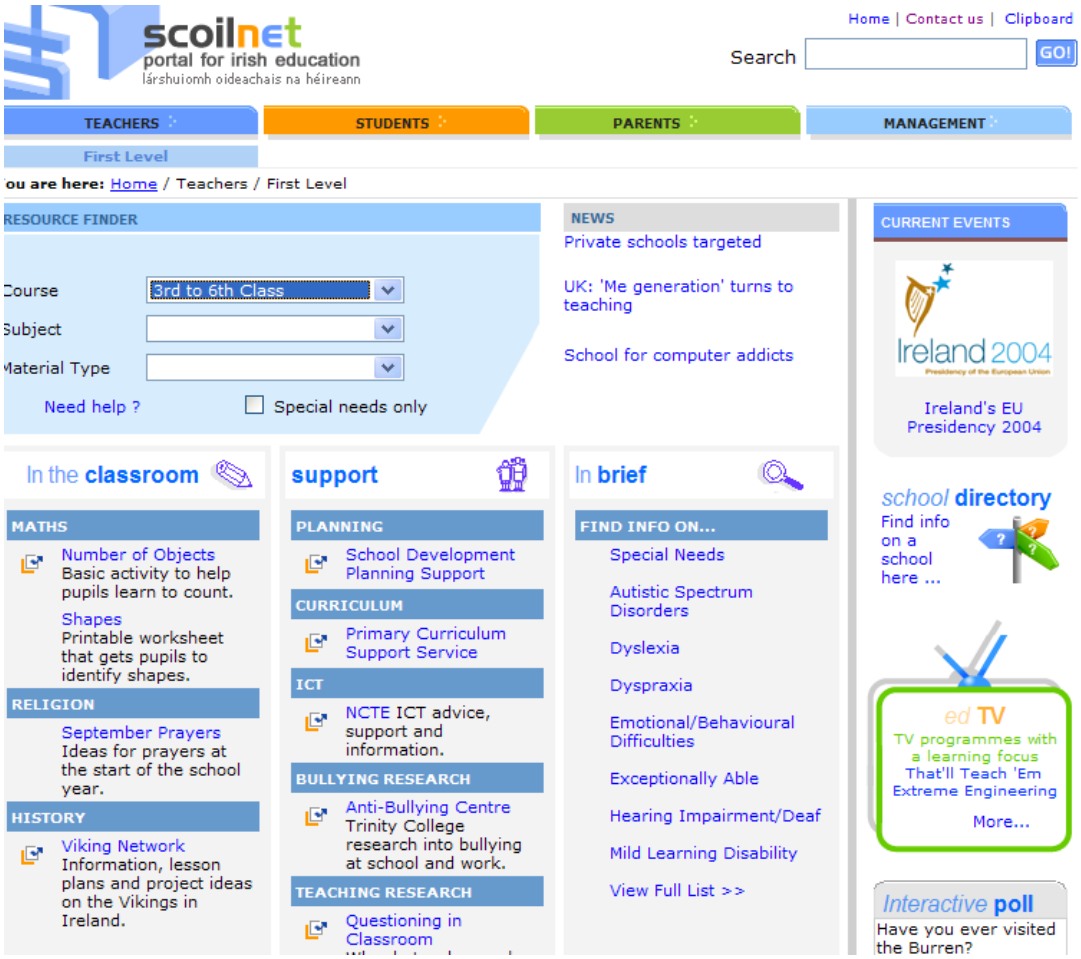
rectangle

There is a Mathematics quiz, which is interactive, but more of this type of material is required.



The rest of the material for teachers is made up of well-prepared lesson notes, the likes of which can be obtained free from the National Council for Curriculum and Assessment (NCCA) and is also available in most school staffrooms.

Teachers and pupils are offered information and resources that are readily accessible elsewhere and that are not tailored to a multimedia environment.



The Scoilnet site originally had threaded discussion groups, but only for teachers wishing to share expertise or ask for advice on the issue of special needs teaching. The use of such threaded discussion groups ought to be extended to all primary teachers and for all subject areas.

The Scoilnet site could also be enhanced through Computer Mediated Conferencing (CMC). This has become a useful educational tool as it allows users to share not only brief messages, but also the sharing and distribution

of documents. CMC relies on a learner-centred approach that rests on principles of collaborative learning.

Gradually, more effective use will be made of this site. The potential of the Internet to aid effective teaching and learning will become more apparent and take on its own momentum, a momentum that will be all the more powerful for being critically scrutinised.

It is a pity that communication between pupils or between schools is not envisaged as part of the site. Communication between pupils could have been fostered to enrich the learning experience, as it does in the classroom. Indeed, communication is key to the Vygotskyian, social interactionist view of education, which emphasises the key role of a social matrix of parents, teachers, and others in the way people learn. As Adams and Brindley have argued elsewhere, there is too often an emphasis on work:

> "undertaken on an individual basis and that any emphasis on IT is predicated on the same individualistic pattern of teaching and learning". (Adams and Brindley 1998: 183)

Pupils have a variety of learning styles, and one of the attractions of new technologies is that they can offer varied learning opportunities. Yet of the general learning approaches available, the one which the Scoilnet website brings to mind is an authority-oriented one, with a progression via a closed system of questions with yes/no answers.

There is little variety of approach on this site. The lack of a communicative depth on the site for pupils, parents and teachers points to a preference for a narrow view of learning and teaching.

III.2 A Resource for Teachers, not Pupils

The Scoilnet website is a text-heavy resource with little imaginative use of the multimedia capabilities the Internet can provide. It is unclear as to its focus (teachers, parents or pupils) and since its objectives are not explicitly made clear on the site itself, it is impossible to judge whether it ever meet its own objectives. Viewed as an officially sanctioned online learning resource for teachers and parents in primary schools, the site is a welcome first step.

As the site currently stands, it is hard to imagine what role it could play in the classroom. A narrow insistence on text-based instruction to the exclusion of truly interactive material is regrettable.

ICT, properly used, can:

- promote authentic communication in language subjects,
- foster learner autonomy,
- encourage collaborative learning,
- shift the role of teacher to facilitator of learning, and empower learners. (Peterson 1997).

The Scoilnet site, as it stands at the time of writing, does none of these things.

III.3 A Good Foundation

Scoilnet represents a great deal of co-operative work and is a promising development. The linking of technology and pedagogical innovation will, in time, be more fully reflected on this site. As Petersen reminds us:

> "educational and technological change are not isolated phenomena: they are dynamic interconnected processes". (Peterson 1997).

Teachers and pupils in the future can hope to see more authentic materials on the site, more interactive material, and a greater commitment to fostering communication.

Scoilnet will one day be a site that will avoid a reliance on mimicking a copybook. The site wishes to be taken as a step away from more traditional media and teaching methods (books and talk-and-chalk). Yet it models itself on those very media and methods it seeks to distance itself from.

III.4 Steps to a Better Scoilnet

A website such as Scoilnet can and does offer access to a formidable amount of data, such as curriculum information, past examination papers, links to other sites offering educational materials, standardised class plans, and so. Yet a neglected area is mining the knowledge of teachers and the other partners in the educational process. For a site to be truly interactive, it will need to do more than offer the familiar "bells and whistles" of so many other sites. Instead, Scoilnet should seek to facilitate a meaningful conversation between teachers and their colleagues.

The thousands of primary teachers in the Republic are part of a vast community of educators. It would be a pity if the untapped resource of their combined knowledge and skill were not to be part of such a medium, which is, after all, grounded in the idea of communication. To be fair to the NCTE, teachers are being recruited in specialised subject areas to contribute to the content of the site on a regular basis. The timely communication of lessons learned and the realities of effective practice are ideally suited to the Scoilnet site, which can act as a virtual classroom to bring together a workforce separated by geography but united in a common purpose.

The following are some proposals on how to make Scoilnet a more central part of Irish educational life. The site should offer:

- A single, integrated platform to serve as electronic staff room for primary teachers, bringing together in one location the documents, forms and information needed to deal with the increasing burden of paperwork.

- Straightforward access to general Department of Education information, such as announcements, staff profiles and so on.
- Access to published policies and proposed curriculum changes
- The ability to take part in online threaded discussions
- Online publishing functionality for school and class news and other automated capabilities
- Web automation of school administrative forms
- Improved search facility to find specific content
- The capacity for teachers and class to “personalise” the Scoilnet experience delivered to them via the portal
- Communication Mediated Conferencing (CMC)
- Video conferencing

- A greater use of authentic language materials (spoken word, songs)
- A commitment to project-based work involving collaborative learning
- A commitment to showcase school projects that make the best use of ICT in the curriculum
- More genuinely interactive content
- Less emphasis on isolated drill and practice exercises
- More emphasis on integrating material into the curriculum.

Of all the suggestions offered, the last is the most crucial. An official policy document envisages the Web as a medium that integrates aspects of the "physical, cognitive, emotional and social domains". (NCAA 2001, p.57) Scoilnet should have been a flagship project to reflect an enlightened approach by Government to ICT. Sadly, the site does not live up to the rhetoric.

The task for Government now lies in implementing its own ICT strategy, rather than devising it. Creating a Web environment that connects individual effort into a unified whole to meet the educational challenges of the future is a task for the Government. An inability to move strategy out of the policy document and into the classroom is a cause for concern. Poor implementation of elaborately stated strategic

goals in a Government-sponsored Web site does not reflect a truly integrated approach to ICT in the Irish primary school system.

Chapter 4

An analysis of the Schools Integration Project (SIP), as a catalyst for ICT Curricular Integration.

I. A Pilot Project

1. From the Ground Up
2. Sharing Good Practice

II. Discovering the Potential of ICT

1. Positive Findings
2. A Sense of Community
3. A Sense of Purpose
4. The Primary Advantage

III. Patterns of ICT Use

1. Low-Tech Solutions
2. High-Obstacles

IV. Lessons learned

1. Gauging Effectiveness
2. Problem of True ICT Integration
3. A Question of Time
4. Where is the Pilot Taking Us?
5. Harnessing the Momentum for Change

I. A National project

I.1 From the Ground Up

In late 1997, the Department of Education and Science mandated the National Council for Technology in Education (NCTE) to announce the Schools Integration Project (SIP). In the summer of 1998, the NCTE invited schools to submit proposals for funding under the project. The project was formally started in April 1999 and for many schools, work in earnest on the project began in September 1999.

From the very beginning, the project envisaged schools working closely with the other social partners, such as industry, small businesses, the voluntary sector and community and sports groups. In addition, schools were encouraged to form inter-school projects. The project was both an opportunity for the education community to make the most of ICT skills learned and a spur for many to take part in ICT training.

The SIP plan was seen as a pilot project that would identify the optimal training and support models, classroom techniques and overall strategy for ICT adoption in Irish schools.

By the close of the project, some 400 schools had taken part in the project. (NPADC p.10)

By their very nature, pilot projects are intended to flesh out theory and identify good practice, effective models and useful strategies. The SIP plan was intended to inform future ICT policy in education. As the NCTE made clear in 1998:

> "The outcomes of these pilot projects will help to determine models of best practice for the use of ICTs across the Irish education system." (NCTE 1998).

I.2 Sharing Good Practice

For such an ambitious, national pilot project to succeed, the results of the enterprise need to be disseminated to the schools taking part, to the schools that did not take part, to administrative and political policy makers, and to the other partners taking part in the work, such as business or community groups. The SIP Online project was begun and developed a portal site (www.sip.ie) to showcase the best of the project work, to act as resource for information on effective ICT practice, and to act as a general sounding board for those taking part in SIP. In addition, the site was seen as a way of "publicising more widely, collateral changes in teaching and learning that are emerging across the SIP schools". (Meleady p.20)

The individual projects in the SIP programme ranged from plans that used e-mail and desktop publishing to present class and school project work, to the use of videoconferencing in remote schools in Cork, to the use of intranets. From high-tech projects to comparatively low-tech projects, the intention was to identify best practice and disseminate it.

II Discovering the potential of ICT

II.1 Positive Findings

In their analysis of SIP, which was then very much a work in progress, Galvin and Mulkeen identified a number of positive points that teachers found in their use of ICT in SIP projects. These included:

- A substantial motivational benefit in the use of new technologies for both pupils and staff
- more authentic learning activities, which acted as a motivating influence
- more exploratory and self-driven learning among pupils

- more meaningful group work.
- a willingness to engage in whole-school or cross-curricular projects
- and increased ties to education professionals at both local and national levels. (Galvin and Mulkeen p.150)

II.2 A Sense of Community

A benefit of the SIP project that was reported by many schools that took part was drawing the school closer to the wider world. One study of Schools IT 2000 projects in Kilkenny, including SIP work, found that primary schools were keener and more successful in creating links with the wider community and indeed further afield, with one enterprising class using the visit of a Brazilian soccer team to explore the culture and history of Brazil. (Sanchez p.10) St Joan's National School in Limerick created an e-mail project linking their pupils with their counterparts in St Agnes School in Brisbane, Australia. (Gleeson p.6) (Sanchez p.10)

Creating closer ties also took part on a more local level. A project involving six schools in North Tipperary on folklore involved teachers and pupils working closely with the Folklore Commission, the Irish Farmers Association and the Library Council. As a teacher involved noted, the multi-school nature of the project involved pupils from rural schools working

together and had a “positive effect on inter-school relations” and between pupils who “hitherto only met each other on a hurling field.” (Carroll p.40)

II. 3 A Sense of Purpose

The way in which motivation influences the pursuit of both short- and long-term goals is explored by Cox, who finds the use of ICT can influence pupils to stay longer on a task and so improve their learning (Cox 1999: 33). That certainly occurred in a SIP project that involved schools from three counties (Galway, Kerry and Sligo) and explored architecture, archaeology, flora and fauna, and folklore through an investigation of field fences. The schools co-operated with each other and with local authorities, the *Sligo Champion* newspaper (which agreed to print a booklet on the project) and the Heritage Council of Ireland. The pupils involved learned how to gather and collate information from a variety of sources, including field trips. There was plenty of overlap between core curriculum subjects, such as English, Irish, history, nature study, and drawing, and a variety of ICT skills were developed. As a teacher involved noted, it was very much a “hands-on

project that used ICT to support curriculum work rather than determine it". (Gallagher p.54)

II.3 The Primary Advantage

Such ambitious and valuable projects, of which these were only a few examples, benefited greatly from the absence of national examinations at the primary level. Such examinations can lead to a strict concentration only on answering the needs of such tests and can unfortunately, lead to an overly narrow view of what is worthwhile in terms of time and effort. In addition, such examinations reinforce rigid distinctions between subjects and seldom lend themselves to a cross-subject approach that can be such a valuable feature of education at primary level.

III Patterns of ICT Use

III.1 Low-Tech Solutions

What many of the SIP projects have demonstrated is that for ICT initiatives to make a difference to the learning and teaching experience, they do not have to be overly technical or cutting edge. A study of the Schools IT 2000 projects in Kilkenny found that commonly used applications such as e-mail and word processing programmes were, in some instances, “sufficient to support and trigger the development of new ICT-enhanced teaching methodology.” (Sanchez p.8) Some schools in Castlebar, Co Mayo, grouped together under the SIP umbrella to create a project on the local history of the town. The project made use of ICT but used it in

tandem with non-ICT strategies. Digital files were made of pupils taking part in a play, using appropriate props and costumes, that re-enacted the events of the Irish 1798 Rebellion and audio files were made of pupils playing associated traditional music. The information was shared with schools in towns that Castlebar was twinned with, and a website was developed to showcase the work. (Keena)

The use of such low-tech ICT techniques, due to their relative simplicity, allows, as Gavin and Mulkeen have noted, "for faster induction and project initialisation." (Gavin and Mulkeen p.149) By quickly getting to grips with the curricular part of their work and engaging earlier with the pedagogical challenges of ICT, such projects "may reasonably be characterised as the 'high teach' projects." (ibid. p.149)

III.2 High-Tech Obstacles

As noted earlier, some of the SIP projects involved ambitious projects that relied on highly complex and technical support, such as

videoconferencing facilities and wide area networks. Some of these projects were reliant on a sponsoring company, a very advanced technical capability among teaching staff and technical assistance from ICT co-ordinators. This poses difficulties if such projects are to survive the pilot project phase of their existence. It is hard to envisage how such projects could be reproduced elsewhere without the considerable and sometimes daunting investment in time, training and technology required. In the long term, as two experts on the Irish ICT area have written, call-out fees and technical service contracts "may prove simply beyond the budgets of the vast majority of schools." (Galvin and Mulkeen p.149)

Still, in terms of computer technology, the high-tech equipment of today can become the low-tech applications of tomorrow. After all, even fairly basic interactive media was once the preserve of high-tech firms and the same held true of such comparatively everyday technologies as word processing programmes and Internet browsers. Even if high-tech ICT solutions are beyond the budgets of most schools, it was a lesson worth learning in the context of the SIP pilot projects, which by their very nature were intended to discover what works and doesn't work in terms of ICT in Irish education.

IV. Lessons learned

IV.1 Gauging Effectiveness

In an official National Policy and Advisory Development Commission (NPADC) survey of a representative group of schools involved in SIP, some 70 per cent reported themselves to be satisfied with the project. (NPADC p.10) This is an impressive figure. Yet it does not amount to an external validation of the project. Indeed, "the lack of external assessment at primary level" has been a source of concern for those seeking to assess initiatives in the Irish educational sector. (OECD p.6)

A worrying aspect of the SIP project has been the paucity of documentation at school level outlining the experiences of the particular projects. The aim of the SIP project was to use the vast undertaking to inform future ICT policies. If that wealth of experience is not adequately recorded, then the task of replicating successful projects becomes much harder. As Galvin and Mulkeen have noted, the initial focus of SIP co-ordinators was understandably 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." (Galvin and Mulkeen p.151)

They also note that if the lessons of SIP are to be disseminated effectively, then it is essential that the individual projects be recorded, collated and analysed.

> "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". (ibid. p.151)

A reason for this, they suggest, is that the onerous time commitment that is involved in recording the progress of SIP projects was not adequately taken into account. My own experience of working with SIP project co-ordinators and teachers would certainly bear out that analysis. There is a wealth of anecdotal information as to the usefulness and richness of the SIP project. However, fully documented projects are few and far between.

It must be borne in mind that SIP Project Co-ordinators have devoted much effort, and much of it on their own time, to the work. If enough documentation of their efforts has not been forthcoming, that must reflect, at least in part, on those at a higher level of planning who underestimated the time and support required to chronicle the SIP project.

In a welcome sign of official recognition of the need to harvest the fruits of the SIP experience, it was announced on April 9th, 2003, that Dr. Galvin of the Department of Education in University College Dublin and his research team have been requested by the Department of Education and Science and the National Centre for Technology in Education to carry out research into the SIP Initiative. ICT Advisors throughout the country, including myself, were supplied with a comprehensive research questionnaire to give to SIP participants in each of ICT support regions. Dr. Galvin conducted a seminar with the ICT Advisors, to assist us in explaining the questionnaire and on impressing on the intended respondents, how important such research is to the SIP project. All completed questionnaires from the SIP co-ordinators were completed by May 13th, 2003, and similar questionnaires completed by participant teachers were completed by May 30th, 2003. These questionnaires are now being collated and analysed by Dr. Galvin and his colleagues and a report will be issued in June 2004 on the findings.

IV.2 The Problem of True ICT Integration

In the meantime, certain issues have come to the fore during the SIP experience. Comments by teachers in the Kilkenny area on the Schools IT 2000 projects reflected that the SIP projects were regarded as important but

that such initiatives tended to be regarded as isolated projects and not as a "a cross-curricular tool inherent to learning". (Sanchez p.11)

This finding echoes the results of a survey of teachers in the Ennis SIP initiative, which involved eight primary schools. Despite the enthusiasm and commitment the teachers displayed, "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." (Walsh p.132)

Such findings are not applicable to the whole country, and the researchers made no such claims for them, it must be stressed. In any national pilot project of the nature of SIP, there will inevitably be a wide degree of difference in the attitudes of participants towards it. Yet such comments do reflect one strand of thought among teachers in their attitudes to ICT.

IV.3 A Question of Time

One source of frustration among teachers with the SIP project has been the many hours required to make projects a reality (Sanchez, Lawson, Carroll). My own experience of helping harried teachers with a great deal of other pressing commitments has certainly served to convince me that this is

a pressing issue of concern. As one teacher has noted, there is concern that in a busy school schedule, schools cannot be expected to carry the "the technical burden of ICT innovation". (Carroll p.40)

As Gavin and Mulkeen have argued, the time teachers must devote to planning and preparing ICT initiatives "remains a significant block to sustainability …Planning, resourcing, managing and implementing change - on the scale that most SIPs are attempting - are time-expensive … Most projects underestimated the effort involved." (Galvin and Mulkeen p.153)

One of the lessons the SIP experience has offered must surely be that innovation fatigue is a threat to the future of ICT initiatives in Irish education. Too many pilot projects in a school can, as one pair of researchers have written, "rob a staff of energy… and lead to a culture that answers new calls for action with a 'this-too-shall-pass' mentality". (Du Four and Burnette)

Asking teachers to make a heroic or mammoth effort on a pilot project over the short term is one thing. But it is simply not realistic or sustainable to ask them to devote such time and effort in the long run. To do so risks transforming ICT from a promising educational tool to a source of anxiety and resentment. If far too much was asked of far too many teachers in the

SIP project, then this must be one of the lessons drawn when framing future ICT strategies and policies.

IV.4 Where is the Pilot Taking Us?

In terms of what the SIP projects achieved, the findings of Dr. Mulkeen of Maynooth University do not make for such a rosy picture as that painted by the NPADC finding cited above that 70 per cent of survey respondents were satisfied with the SIP project. The survey was based on national data from 1998 and 2000, when the full flowering of the SIP project was yet to take place. Yet his initial findings are nonetheless intriguing. He found that the participation of primary schools in pilot projects generally, as opposed to the SIP project per se, had higher scores for ICT use in subject areas. (Mulkeen p.12) He suggests that the higher subject use of ICT in schools taking part in pilot projects may correspond to the manner in which such schools are selected for pilot projects. In other words, forward-looking schools tend to volunteer for and be selected to join pilot projects. It is little surprise that they then prove adept at adapting to ICT anyway.

A worrying finding from Dr. Mulkeen's survey was that the data did not indicate that "increases in subject use of ICT were sustained after the end

of projects." (Mulkeen p.13) This is troubling because it casts doubt on the purpose of having a pilot project in the first place. If the results are short-lived then it seems futile to try and replicate them elsewhere. On the other hand, perhaps it is only to be expected. By their nature, there is something provisional or ad hoc about pilot projects. Unless the lessons they offer are taken on board and promoted as truly national policy drive for all schools, it cannot be expected that a few schools can be expected to continue blazing a trail for the rest to follow.

IV.5 Harnessing the Momentum for Change

Pilot projects can create their own dynamic in that great effort can be expended on them precisely because they are of a limited scope and duration. With the finish line passed, it is too much to hope that those taking part can be expected to do another few laps just for the fun of it. The end of the SIP pilot project creates a vacuum that only those entrusted with making policy at a national level can fill. If schools are not to be demoralised and if ICT initiatives are not to always rely on a hardy group of pioneers, then the Government must act quickly to draw some lessons from what SIP has offered.

More specifically, the Government must recognise and reward those innovative projects that truly integrated ICT into the curriculum. Projects that rely on comparatively low-tech yet highly effective ICT equipment in ways that motivate students should be replicated. The policy makers must pay attention to issues of sustainability, both in terms of technical support and resources and the crucial issue of time expected of teachers. Finally, teachers should be rewarded for their efforts in putting together and sustaining so many creative, thought-provoking and marvelous projects that enthused their students and provided them with cross-curricular and authentic learning experiences.

There is reason to hope that policies drawing on the best SIP has to offer will emerge. The significant investment the Government has made deserves recognition and praise. The farsighted decision to fund a comprehensive and national analysis of SIP is heartening and bodes well for the future.

Chapter 5

Taking stock and looking forward.

I. Gauging Progress

1. An Official Survey
2. Number of Computers
3. Internet Usage
4. Use of ICT
5. Teacher Skills and ICT Training
6. School Priorities

II. Assessing Effectiveness

1. A Need for More Research
2. A Case for School Inspections

III. Maintaining Momentum

1. Recognising Progress
2. Avoiding Possible Pitfalls
3. Looking to the Future

I. Gauging Progress

I.1 An Official Survey

The last six years have witnessed a huge investment in ICT in Irish education. Schools have been equipped with computers, thousands of teachers have been trained in ICT skills and the National Centre for Technology in Education (NCTE) was set up. A web site to support the primary curriculum is up and running and hundreds of schools have participated in pioneering projects to pilot ICT integration. It is time to take stock.

In December 2002, the NCTE conducted a national census of ICT in schools. Such surveys were previously conducted in 1998 and 2000. The preliminary results were published in May 2003. As this is the latest and most comprehensive statistical analysis in relation to ICT in schools, it is a useful resource in gauging the effectiveness of recent policy-driven ICT interventions and projects in schools.

I.2 Number of Computers

The number of computers in primary schools has increased greatly, and there has been a corresponding increase in the primary pupil-computer ratio. In 1998, this ratio stood at 37:1 and had reached 12:1 by 2002. This is a

significant accomplishment in its own right, and is evidence of the Government's unprecedented investment in ICT. It would be surprising indeed if the ratio had not dropped, given the grants schools received to purchase ICT equipment. Such a finding does not, of course, indicate if these computers are being used in schools or how they are being used. Such a figure reveals, in short, that ICT equipment is present throughout the primary school system but does not reveal if ICT has been integrated into the curriculum. (NCTE 2003, p.4)

Approximately 60% of the computers in schools were less than four years old, the survey revealed. Again one would expect that the vast majority of computers would be relatively new, due to the large amount of funding made available for the purchase of hardware and software. The figure points toward a need for continuing investment in computer equipment in schools as older hardware becomes obsolete. The funding implications of this fact must weigh heavily on those tasked with allocating finite resources to a vast school system.

The survey revealed that schools were allocating money to ICT in addition to the grants received from NCTE. Primary schools spent an average of €4,200 each last year on computer hardware and software. This money, for the most part, came from parents and other fundraising drives or

was diverted from other budgets. Only 16.5% of such funding came from commercial sources. (NCTE 2003 pp.4-5)

This is a troubling finding. If ICT is to play an increasingly central role in the classroom, then all State-funded schools should have equal access to up-to-date equipment. If schools in wealthier catchment areas can afford more ICT equipment, the pupils in other schools will be at a disadvantage.

I.3 Internet Usage

All primary schools have access to the Internet, the survey reveals. Primary schools spent an average of 14 hours per month online, an increase of almost six hours on the 2000 figures. However, 33% of primary schools never used the Internet. Some 19% of schools had developed a website, a figure that owes much to SIP projects. However, a disappointingly low 9.7% of schools had websites that included curricular resources or showcased the work of pupils. (NCTE 2003, p. 8)

The survey did not explore how many schools used the Scoilnet website. This is a curious omission given that the site is run by the same organisation, the NCTE, which conducted the survey. It is also worth remembering that Scoilnet is intended to be the official educational portal for Irish schools and that it is specifically intended to supply curriculum

resources. It would be useful if future surveys explored how many schools make use of Scoilnet and for what purposes.

I.4 Use of ICT

The use of ICT in primary schools was almost universal, with more than 95% of classes using ICT at least occasionally. Yet software was mainly used for word-processing and drill or reinforcement games. In junior classes, 1,934 schools were using reinforcement games, and they accounted for 50% of their ICT usage. (NCTE 2003, pp.9,14) For the older classes, there was more emphasis on graphics, database and spreadsheet programmes. The reliance on drill shows that ICT use does not guarantee imaginative ICT use. As Fullan has warned:

> "a teacher could use new curriculum materials or technologies without altering the teaching approach". (Fullan p. 39).

ICT was used in English, Mathematics, Geography and History in most primary schools. Some 98% of schools reported use in English, at least occasionally, and 36% were using it weekly. This was a drop from 49% using ICT weekly in English in 2000. The NCTE speculate that this worrying drop may be due to the inclusion of an "ICT skills" category in the 2002 survey, causing a change in reporting of some use. However, they

concede it may reflect a true reduction in usage of ICT within subject teaching. (NCTE 2003, p.8) Urgent research needs to be carried out to see if this is indeed the case. If there has been a reduction in ICT usage in core curriculum subjects, then the causes of this reduction need to be identified and quickly addressed. I would prefer to believe, in the meantime, that this unsettling statistic is, as the survey's writers have implied, an anomaly. In any event, the confusion that may have resulted from the inclusion of the 'ICT skills' category should not be repeated in subsequent surveys.

Subjects where ICT was used, primary schools

	% using ICT in this subject occasionally or more	% using ICT in school weekly	% using ICT in school weekly 2000
English	98.0	35.9	49
Mathematics	97.3	23.8	35
Geography	95.6	9.3	22
History	93.8	7.3	18
ICT skills classes	91.6	17.6	NA
Learning support/remedial	89.8	46.5	41
Science	85.5	5.8	16
Extra curricular projects	85.2	13.3	24
Arts Education	70.9	3.3	19
SESE (Social, Enviromental & Science Education)	68.1	4.3	12
Gaeilge (Irish Language)	61.0	3.9	6
SPHE (Social Personal Health Education)	54.2	1.6	
Religion	38.8	1.6	
Modern Languages	17.9	0.8	
Physical Education	12.8	0.4	

(Source: NCTE 2003, p.11)

I.5 Teacher skills and ICT training

The figures for primary teachers who use ICT in their teaching are encouraging, with 60% responding that they used computers in their work. The survey also reveals that an impressive 90% of primary teachers have basic ICT skills and that approximately 82% have some e-mail and Internet skills. Some 60% of teachers use computers in their teaching, and this is an encouraging figure. There appears to be a need to concentrate more in future on training teachers in the pedagogical skills to make the most of ICT rather than on technical skills. As the OECD noted of ICT in Irish education:

> "As ICT skills continue to evolve and change it is important that IT in-service training focuses on the pedagogical skills needed to integrate the technology in teaching and learning rather than the technology itself." (OECD, p.8)

It was to be expected that much of the initial effort in training teachers should concentrate on equipping teachers with the expertise to use ICT. The priority in future should surely be on how to make more pedagogically effective use of ICT in the classroom.

Teacher ICT Skill

	Primary	Post primary	Special schools
Teachers with some computer skills: (e.g., would be able to produce a document using a word-processor, or run CD ROM software)	90.9	77.6	88.3
Teachers with some email and Internet skills: (e.g., would be able to send and email or browse the web)	81.8	69.5	80.8
Teachers with computers at home	72.3	57.7	66.8
Teachers with Internet access at home	62.3	52.2	62.5
Teachers who use computers in lesson preparation	43.2	39.4	57.1
Teachers who use computers in their teaching	60.2	27.8	76.6

(Source: NCTE 2003 p.18).

I.6 School Priorities and Needs

The survey asked the schools to identify ICT priorities and needs identified by the schools. Some of the issues identified included getting pupils to a basic level of competence and to get pupils involved in high-level ICT projects. (NCTE 2003 p.22) Schools do not seem to have reported what a number of experts have cited as the most pressing concern for teachers involved in ICT integration - the time it requires to create innovative ICT lessons and projects for the classroom. As one teacher involved in a time-consuming SIP project has written:

> "Whether other teachers in other schools should be expected, or would be willing, to devote so much extra-curricular time to integrate technology is debateable." (Keena, p.68)

Another teacher involved in a SIP project involving many schools grasped the transformative potential of ICT.

> "If, as seems increasingly likely, the learning outcomes justify this use of time, then there may even be implications for the way we structure and run the school day." (Gunning, p.62)

Such insights reveal that teachers grasp that sustainable ICT integration requires more attention to be given to ICT's place as an integral part of the curriculum. Requiring teachers to commit a great deal of time to projects that appear to stand apart from the curriculum is a symptom of a phase that can only regarded as temporary and unsustainable. The survey's concentration on such school priorities as software licences or faster Internet access reflects a continuing focus on technology rather than on the more far-reaching implications of ICT for the way teachers work.

II. Assessing Effectiveness

II.1 A Need for More Research

The latest NCTE survey is a factual report that gives a comprehensive picture of how schools spent their ICT grants and provides a statistical snapshot of some of the issues that concern schools. Its task is not to discuss the extent of ICT integration into the curriculum. The data it presents provides all those in the education sector with a better understanding as to how this money was spent by schools. The task of gaining insight into the extent of ICT integration is surely better left to central government.

However, in Ireland there has as yet been no effective method of gauging the effect teacher training, for example, is having on the integration of ICT into the primary curriculum, as school inspection reports are private and confidential. The Principal, Board of Management and the parents of an inspected school can have access to the Inspection Report. These reports are not available to the ICT Advisors or the general public, unlike the UK system, where they are posted to the Ofsted website, for the whole world to see.

As things stand, there is simply no evidence as to whether ICT is being integrated in a pedagogically effective way. This has clear and worrying implications for policy makers. If the educational authorities do not have

reliable data on this crucial area, it is hard to see how they can formulate a more effective ICT policy.

II.2 A Case for School Inspections

With no statutory obligation on school inspectors to inspect the use of ICT in schools, we have to rely on data supplied by teachers in surveys such as those conducted by the NCTE. Inspectors often comment on ICT use in particular schools, but there is no formal obligation on schools to use ICT. This must change if the use of ICT in schools is to be effectively accessed. In Britain, there has been official recognition of the need to assess the nature of ICT usage in schools. Ofsted in 2001 saw a need to:

> "monitor and evaluate the standards of pupils' work in IT and the quality of teaching where ICT is being used". (Ofsted p.11)

It is high time that the official inspectorate was instructed by Department of Education and Science to assess the way in which ICT is being integrated into the curriculum. Given the State's investment to date, it is too important an issue to be delegated to non-governmental organisations. Such studies and directives would invigorate efforts that have too often been marginalised. There is a lot of 'craft knowledge' among teachers around the

country as to what makes for good ICT practice in the classroom. The Department of Education needs to tap into that expertise and share it.

More generally, there needs to be more qualitative studies on the effect of ICT in Irish schools. As a recent article has noted,

> "to date most of the studies of IT 2000 have been quantitative rather than qualitative in nature … substantial qualitative studies are central to the two Scandinavian initiatives (the ICT initiatives of Sweden and Finland). Ireland could benefit from following such examples." (Freeman, Holmes and Tangney, p.6)

To ensure that funding for ICT integration in Irish primary schools continues, it is essential that policy makers and taxpayers can see what ICT can achieve. To do this and rally against any potential of erosion of support for ICT initiatives, it is clear that the progress made to date must be analysed and disseminated.

III. Maintaining Momentum

III.1 Recognising Progress

Irish primary schools have undergone something of a revolution in their use of ICT over past number of years. We have seen in previous chapters how the government has put in place a comprehensive, far-reaching and imaginative set of programmes. The social partnership model, which has proved so effective in the economic sphere, has been used to shape the detail of this policy, with the involvement of educationalists, business, unions and teachers themselves.

The creation of the NCTE and the NPADC will help ensure that these developments are not allowed to wither on the vine. Bureaucratic structures, so often maligned, are actually essential to ensuring that central government continues to take the long view and does not ignore long-term goals to create short-term savings.

More particularly, the actual benefits to teachers and pupils to the ICT revolution must be spelled out. This is not to say that ICT should be lauded as a means in itself or as a catch-all bag of tricks. Rather it should be seen as a powerful way of empowering pupils and teachers in developing problem solving skills and general learning; as a key way of individualising learning;

and as a means of promoting an active and participatory learning environment.

III.2 Avoiding Possible Pitfalls

Yet there are potential storm clouds ahead. In January 2003, the government announced it was making an effective cut in the school building and renovation programme.

> "Building work on almost 400 primary schools has been frozen because of Government spending cuts. The schools affected include several already singled out by the Irish National Teachers' Organisation (INTO) as being unfit accommodation for pupils and teachers." (Flynn, 2002)

It has been suggested by government that university fees will be introduced and the savings will be invested in primary education. The proposal has cost the government sorely in terms of political capital and has been shelved, at least for now. Although no official notification of cuts to the ICT budget have been announced, it is generally accepted by ICT Advisors that, at best, there will be no increase in ICT funding for schools, in the near future.

In economically difficult times, the ICT programmes may appear to offer central planners a soft target. Indeed, as one writer has noted of the broader European context,

"some 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." (Blamire, p.3)

In the United States, one of fiercest critics of expenditure on ICT in education is Todd Oppenheimer. He states that:

> "In a poll taken in early in last year U.S. teachers ranked computer skills and media technology as more essential than the study of European history, biology, chemistry, and physics; and than reading modern American writers such as Steinbeck and Hemingway or classic ones such as Plato and Shakespeare." (Oppenheimer, p.2)

He is rightly critical of those who see ICT as an end in itself. He is also critical of studies commissioned by "lobby groups" that claim that ICT has improved students' academic achievement. He cites the Clinton administration's task force that was responsible for getting more computers into schools. The task force, which was made up of 36 leaders from industry, education and assorted interest groups, commissioned a report from McKinsey and Co., an international management consultancy firm. The management consultants produced a report that was more anecdotal than analytical, he argues. (Oppenheimer, p5)

The fact remains that even in Ireland, which has seen a vast and sustained effort to incorporate ICT into the primary school system, funding cannot be taken for granted. It is also undeniable that the lack of qualitative evidence to justify the expenditure on ICT to date does not help matters. It is a welcome development that Dr. Conor Galvin of University College Dublin has been commissioned by the Department of Education and Science to produce just such a study. His report is due in July 2004.

III. 3 Looking to the Future

Two political scientists, in an analysis of the reasons that educational planning may fail, argue that:

> "any particular policy [reform] decision is susceptible to an erosion of political support as other issues become relatively more important over time". (Sabatier and Mazmanian, p.499)

That erosion of support for ICT policies in education has not occurred in Ireland. Although the country has had three Ministers for Education (Mr Michael Martin, Dr Michael Woods and Mr Noel Dempsey) in a little over six years, there has been a remarkable unity of purpose regarding ICT initiatives over this time. The setting up of the ICT Policy Unit under the aegis of the Department of Education and Science's dedicated staff will ensure that strategic planning and the allocation of ICT initiatives and

funding remains a political priority. Great credit is also due to the staff of the National Centre for Technology in Education, the National Policy and Advisory Development Committee, the National Council for Curriculum and Assessment, the Teacher/Education Centres, the ICT Advisors and of course the nation's teachers for promoting the use of ICT and making sure it remains a political priority.

Great strides have been made in the integration of ICT into the Primary Curriculum, but this integration needs to be measured and analysed so that improvements can be made to the use of ICT in education. The key question must be how to continue to effectively integrate ICT into the Primary Curriculum. More research is needed into what the various ICT projects so far have achieved and whether the lessons can be replicated in other schools. The issue of technical support for schools must continue to be addressed by the ICT Policy Unit. More attention must be given to empowering teachers to see ICT as a pedagogically effective teaching resource instead of a time-consuming headache. Teachers deserve to be rewarded for their efforts.

A key way of advancing ICT's integration would be to give a defined role to its place in such subjects as Science, Mathematics and Languages. In addition, the Department of Education's inspectors should assess ICT integration. Such an inspection regime need not, if handled properly, present

the same difficulties that, have surrounded Ofsted's relations with teachers in England. The inspection reports could then be made available to ICT Advisors so that any shortfalls in the provision of help could be rectified. Without assessment, the danger is that support will be confused with success.

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