OECD/CERI ICT PROGRAMME

ICT and School Improvement

Executive Summary for Ireland

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Executive Summary

The six case study schools, three post-primary and three primary, were identified by the Department of Education and Science (DES) and the names were notified to the research team. Field work was undertaken during the period November 2000 to February 2001.

This overview report deals with

- the Irish context, from the perspectives of school improvement and ICT
- a brief description of the case study schools, with particular reference to school improvement and ICT
- the outcomes from the Irish case studies based on the hypotheses
- other relevant findings from the case studies
- future projections
- main conclusions

School improvement in the Irish context

The relationship between ICT and school improvement is central to the present study as outlined in the OECD/CERI Workbook. By way of context it should be noted that the significance of the relationship between school improvement and curriculum change has not received the attention it deserves in the Irish situation for a variety of reasons. Before considering the role of ICT in teaching and learning, certain key aspects of Irish education should be noted. The most recent external critique of Irish education, the 1991 report of the OECD Examiners, identified certain characteristics that are of relevance when the context for the present study is being considered. These include:

- 'the dominance of examinations, particularly at the upper secondary level, ensures that teaching and the curriculum are largely determined by examination requirements' (OECD:1991,67).
- 'the absence of non-instructional forms of learning' and the emphasis on ' a didactic approach' (OECD:1991,55-67)

While the Examiners were alluding to both primary and post-primary education, it should be noted that expository teaching is particularly evident at post-primary as established by Callan (1997), Mackey (1998) and others. Curriculum reform in Ireland has been addressing perceived needs in what the OECD (1991,76) categorized as a fashion that is 'ongoing but piecemeal' (see also Callan:1996,100). Such reforms have been driven from the centre and the impact of school cultural factors on reform efforts has been largely ignored. (Callan:1997; OECD:1991,62-63).

Financial resources were extremely scarce during the eighties and early nineties and ICT did not figure prominently in Irish education policy until 1997. There is no formal provision for an ICT-based subject on the mainstream curriculum to this day. The lack of attention to the significance of the school factor in curriculum change and the paucity of curriculum research, development and evaluation should be understood in the context of these same economic difficulties at a time when the school-going population was continuing to rise. These factors are reflected in the nature of the improvements identified in the schools that were the focus of the present study.

Certain recent developments have resulted in a focus on whole school factors both in policy and practice. These include the requirement for whole school planning included in the 1998 Education Act, the promotion of School Development Planning (Department of Education:1995,157-159; 181) and the pilot project on Whole School Evaluation

ICT in the Irish context

The *Schools IT2000* initiative was the first large scale attempt to integrate ICTs in teaching and learning at both primary and post-primary level. Launched in November 1997, *Schools IT2000* aimed to ensure that:

- *pupils in every school have the opportunity to achieve computer literacy and to equip themselves for participation in the information society;*
- *support is given to teachers to develop and renew professional skills, which will enable them to utilise ICTs as part of the learning environment of the school* (DES:1997)

As part of this initiative the DES funded selected schools to implement pathfinder projects, known as Schools Integration Projects (SIP). The aim of SIP projects, which range from curriculum-based to technical initiatives, is to develop and investigate areas of good practice so as to inform future policy.

Brief description of the Irish case study schools

The primary schools included a rural school with 81 pupils and two urban schools with some 300 pupils each. The post primary schools also varied in size and type, one being a 1000 student community college catering for a large number of disadvantaged students, the second an 800 student fee paying college and the third a 500 student Christian Brothers secondary school.

Two of the six schools involved in this research did not have a history of ICT use and would not have been categorised as ICT rich schools, were it not for recent state investment in the area of ICT. The other four schools had gradually introduced ICT before significant state investment became available and use of ICT had been evolving organically over time at these sites.

The case study schools had recently received varying levels of investment from the Schools IT2000 initiative and were also involved in SIP projects aimed at identifying areas of best practice in the use of ICT.

Primary schools (4-12 years):

St. Joan's school has 17 teachers and some 320 pupils. Various improvements were noted at this site, mostly to do with school infrastructure. ICT resources were minimal up to 1998 when the town's success in a national IT competition resulted in the sudden infusion of a significant amount of computer hardware and software.

St. Sheila's school has 14 teachers and some 300 pupils. Openness to change and willingness to innovate rather than any single initiative was identified as the improvement at this site. Such improvements included extra-curricular activities, community links and attention to Special Educational Needs (SEN) pupils. The school has a history of ICT use since the mid 1980's, using resources acquired mainly

through school fundraising and local sponsorship. It is recognised locally and nationally as an 'ICT school'.

Scoil Peadar agus Pól is a 'three teacher' primary school situated in a rural area. The main improvement identified in this school was the development of a locally based curriculum. There was a history of ICT use prior to the Schools IT2000 initiative because of the principal's success in attracting a large investment in ICT from a local industry.

Post-primary schools (12-18 years)
St. Fiachra's community college has some 1000 students, a high proportion of whom come from disadvantaged backgrounds. The main improvement here was described in terms of a commitment to meeting the various needs of its diverse population rather than in terms of any specific developments. The school has used computers since the early eighties, primarily for skills acquisition courses. The integration of ICT in different subject areas is now being attempted and is more advanced in some areas than others.

Shenley College is a co-educational fee-paying boarding school with a population of some 800 students. Improvement was predominantly seen in terms of recent infrastructural developments. Computers are being used in technical/vocational subjects and the integration of ICT as a teaching and learning tool in other subject areas is at an early stage of development. Most progress to date has been made in Science and Career Guidance.

St. Luke's is a boys' secondary school with a population of 500 students. Four main improvements were noted at this site: increased levels of staff participation in decision making; improved provision for SEN students, the introduction of two national senior cycle programmes and developments in ICT. While the school did not have a history of ICT use, a substantial investment from the *Schools IT2000* initiative has enabled the introduction of laptops to three class groups.

The outcomes from the Irish case studies based on the hypotheses

Hypothesis 1
Technology is a strong catalyst for educational innovation and improvement, especially when the World Wide Web is involved. The rival hypothesis is that where true school-wide improvement is found, technology served only as an additional resource and not as a catalyst, that the forces that drove the improvements also drove the application of technology to specific educational problems.

The evidence supports the rival hypothesis in the four Case Study schools where ICT use had evolved over time from within the school (Scoil Peadar agus Pól, St . Sheila's, Shenley College and St. Fiachra's). The role of technology in these schools has been one of additional resource rather than catalyst. There is some evidence for both the hypothesis and the rival hypothesis in the case of the other two schools. The common denominator between these latter two schools is that levels of ICT resources had increased dramatically over a short time, resulting in pressure to use ICT. On the other hand, the ICT infrastructure had built up gradually in the case of the other four schools.

Hypothesis 2
The diffusion of the innovation/improvement (and therefore of ICT) followed the traditional diffusion pattern for innovations, as outlined by Rogers (1995). The rival hypothesis is that technology functions differently from traditional innovations and that therefore different diffusion patterns occur.

Evidence to support the traditional diffusion pattern was found in St Sheila's, Scoil Peadar & Pól and St. Fiachra's, schools where a good infrastructure had been developing over time. Data gathered at Shenley College and St. Luke's is inconclusive insofar as there is some evidence in favour of both the hypothesis and its rival at these sites. This hypothesis is very difficult to apply in the case of St. Joan's because of the influence of external incentives in the school environment. The same pattern is emerging for this hypothesis as in the case of Hypothesis 1 in that St. Joan's and St. Luke's are different because of the influence of external factors. It is noteworthy that the diffusion of ICT within four of the Case Study schools depends greatly on the presence of a strong innovator who enjoys high standing in the school, motivates other staff members and provides day-to-day technical support for the staff.

Hypothesis 3
Successful implementation of ICT depends mostly upon staff competence in the integration of ICT into instruction and learning. This hypothesis assumes that teachers mediate ICT applications when they are successful, and that ICT academic value relates positively to teacher competence. The rival hypothesis is that the school technological infrastructure and student ICT competence rather than staff competence determine ICT implementation outcomes.

Evidence in favour of the hypothesis was found at St Sheila's and, in the case of some subject departments, at Shenley College and St Fiachra's. The successful integration of ICT at St. Fiachra's was severely hampered by technical difficulties. Evidence was found to support both the hypothesis and the rival hypothesis in the case of the remaining schools.

It was noted that, in the highly academic context of St. Luke's, the paradigm shift required whereby teachers make the move from transmitters of knowledge to facilitators of learning (where students use ICT as a learning tool) is particularly difficult to achieve.

Hypothesis 4
Gaps in academic performance between high and low poverty students will not increase when all students have equal access to ICT. The rival hypothesis is that equal access to ICT will lead to more advantaged students increasing the performance gap with disadvantaged (high poverty) students.

The virtual absence of 'high poverty' students at Shenley College and St. Sheila's made it impossible to draw any conclusions in relation to this hypothesis at these sites. There was support for Hypothesis 4 in the case of two of the three post-primary schools in the study, St. Fiachra's and the LCA class at St. Luke's. The evidence supported the rival hypothesis in two of the primary schools, Scoil Peadar & Pól and

St. Joan's. The motivational benefits of classroom use of ICT were noted in all Case Study schools.

Hypothesis 5
Successful implementation of ICT will lead to the same or higher academic standards in spite of the low quality of many ICT materials. Academic standards are a function of teacher and school expectations and not of the standards of textbooks, ICT materials, and the like. The alternative hypothesis is that ICT use will lead to a lowering of academic standards as students spend more time on marginally beneficial searches and in browsing poor quality Web and courseware content.

Support for this hypothesis was found in the case of the LCA class at St. Luke's and at St. Sheila's. The conclusions for the remaining schools were inconclusive. Some evidence was found for both versions of the hypothesis at Shenley College, St. Joan's and Scoil Peadar & Pól, while there was insufficient information in relation to academic standards to justify either version of the hypothesis in the case of St. Fiachra's.

Other relevant findings from the case studies

The rich qualitative data arising from the interviews and observations highlight a number of other issues not fully described within the framework of the five hypotheses. It should also be noted that the research team experienced difficulties in relation to Hypotheses 4 and 5 because of the paucity of data on academic performance in the context of Irish schools. These difficulties were compounded by factors such as the newness of ICT use for teaching and learning purposes in most schools, the fact that such use tended to be limited to certain subjects at post-primary and the absence of external assessment at primary level.

Given the complexity of educational innovation and improvement[1] it is not surprising that no *single* intervention, including ICT, is found to serve as a strong catalyst for change. In the Irish context, *Schools IT2000* is a recent development in an environment where little emphasis had previously been placed on the integrated use of ICT for teaching and learning.

While schools clearly require more time to successfully integrate ICT, the existence of pockets of good practice has clearly emerged from the case study schools. Some innovative 'early adopters' have been identified in each school. 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.

ICT resource levels had been minimal in two of the case study schools until state investment lead to dramatic improvements. In contrast, ICT had been developing organically over a longer period in the other four schools. The pressure resulting from the significant investment in the former schools was not evident in the other schools where teachers experienced greater freedom in relation to the adoption of ICT.

[1] As identified by authors such as Fullan:1991 and 1993; Hord:1987; Sarason :1996; Cuban:1988.

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, particularly at post-primary level. It is important that future professional development courses enable teachers to examine the potential of ICT for cross-curricular and subject-based ICT teaching and learning.

The importance of the socio-cultural context of Irish schools has emerged clearly in the case of the post-primary case study schools - the dominant role of external examinations and of teacher and school cultural factors, as found by Callan (1997), OECD (1991), Hannan (1987) and others. There was more evidence of the integrated use of ICT in the primary schools in this study. This may be due to several factors including the absence of state examination pressure, greater access to ICT facilities and resources and the flexibility of primary school structures e.g. timetable.

The positive contribution of ICT in SEN class situations has emerged strongly in the case of St. Luke's, St. Fiachra's and in all primary schools in the study.

There is a strong perception at St. Luke's that laptops will not be widely used as long as post-primary school students have to take two 'pen and paper based' state examinations which have major implications for their life chances.

Future projections

In view of the prominent role of *Schools IT2000* in providing resources for schools and providing foundational training, it is only reasonable to pose the question: what happens when this initiative comes to an end?

The extent to which ICT is integrated for the promotion of teaching and learning will greatly depend on cultural and structural changes in the broader context of Irish education, particularly at post-primary. For example: the present emphasis on a didactic pedagogy needs to be replaced by one where active learning, pupil collaboration and inquiry are prioritised and rewarded; greater recognition of the influence of school cultural factors on educational reform efforts. The recent establishment within the DES of a unit for the promotion of school development planning is timely. This provides an ideal opportunity for debating and recognizing the potential of ICT for teaching and learning at the level of individual schools.

The long established dilemma between externally generated change and 'ground up' change emerges in the case study schools. On the one hand, many teachers in St. Luke's and St. Joan's referred to the pressure resulting from their recently acquired ICT resources. Yet, this may be seen in a positive light insofar as teachers in such situations find themselves with little alternative but to begin to adopt ICT, sometimes because of the enthusiasm of the pupils. It seems reasonable to ask: what will happen when the pressure is reduced?

In this context, there is a definite need for increased levels of initial and continuing professional development and support, where the focus is on constructivist pedagogical principles and on the use of ICT for teaching and learning within such learning environments. Increased levels of technical support and greater emphasis on the development and evaluation of appropriate software are also necessary. With the

rapid evolution of ICT schools will be constantly challenged to equip students with the necessary skills to utilise the technology in their daily lives and to integrate the latest technology into teaching and learning to enhance the students' experience. This has been evident in previous years with the attempted introduction of multimedia CD ROMS, the Internet and hypertext media, video conferencing etc. 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.

The strong potential of ICT for improving the teaching and learning environment for SEN students, which has emerged clearly from the case studies, merits further attention from the DES and school authorities.

It was noted in the case study schools that the computers were mainly housed computers in cluster rooms for security, financial and practical reasons. As their traditional use focused on skills acquisition courses, computers were laid out in a linear fashion that allowed student to work independently. If the focus is to change to the integration of ICT across the curriculum, schools need to re-examine the current distribution of ICT resources in schools. Due to timetabling constraints, access to computers for the wider staff and student population is restricted where large, heavily resourced cluster rooms are established. Where computer rooms have been designed and laid out to allow students to work individually on computers, this hinders group work and student collaboration. A wider distribution of the equipment throughout the school will increase accessibility and may promote greater integration.

Conclusions

The significance of contextual factors has been highlighted in the present study. These include the lack of focus on whole school factors, particularly in the case of post-primary, as reflected in the many different understandings of school improvement and curriculum integration emerging in the case study schools. The national *Schools IT2000* initiative is a recent innovation and ICT practice was constrained by limited resources before that.

While pockets of good practice in ICT have emerged over a relatively short period of time, it would have been unreasonable to expect that a clear relationship would have developed between ICT and school improvement in the circumstances. The dominance of the expository paradigm of teaching and learning, particularly at post-primary, represents a major barrier to the successful integration of ICT into teaching and learning in the Irish situation. Unless this issue is addressed, it is unlikely that the meaningful integration of ICT into learning will occur and ICT use may be mainly confined to computer applications, some project work for non-examination classes, some use with SEN students and improving the quality of teachers' classroom presentations.

The importance of an integrated, coherent approach at the level of policy making and implementation to the realization of the huge potential of ICT for the promotion of teaching and learning emerges as a key issue. Evolving ICT policy must be given the necessary financial support if the rhetoric is to be translated into reality. Greater attention to whole school development must be accompanied by investment in the on-

going professional development of teachers so that the quality of pupils' learning becomes the dominant concern.

The lessons learned about ICT and school improvement from the present study include the importance of educational leadership, effective co-ordination, ongoing professional development and coordinated national policy. But above all the dominant paradigms of teaching, learning and assessment must be questioned and schools must begin to operate as dynamic, organic wholes rather than as fragmented institutions if ICT is to realize its potential for the promotion of teaching and learning In Ireland.

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