

Connecting the Unconnected in Rural Ireland

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INTRODUCTION

How to integrate ICT into schools in an appropriate and meaningful way remains one of the most fraught questions in education today as teachers and policy makers alike strive to make the most out of the Internet and other technologies in the classroom. Choosing appropriate content, building the necessary skills amongst teachers, finding a way to integrate computer-supported learning in all subjects, these are familiar issues.

But in the meantime the issue of basic access to the Internet still remains and should not be ignored. It is true that throughout the developed world, most schools have access to the Internet. Recent EU figures suggest that 90% of EU schools have Internet access, and this figure is growing all the time (EU, 2003). However increasingly narrowband access is seen as insufficient for real educational use, and provision of broadband access is seen as a major objective in educational ICT policy. In Northern Ireland, for example, the current ICT strategy has provided broadband access for all second-level schools. City schools are offered more and more choice as ADSL services roll-out and competition drives costs down. But what about the rural schools and schools in towns with populations too small to attract a competitive broadband offer? Despite the best efforts of all concerned, broadband access to the Internet in Irish schools remains considerably below European norms and there is a danger that Irish pupils will find themselves on the wrong side of a digital divide in terms of their access to and use of resources and opportunities afforded by fast access to the World Wide Web. Nolan Bowie notes for example that in the U.S. there is a geographical dimension to the digital divide, with rural families less likely to have access to the Internet than urban families (Bowie, 2000).

County Donegal is one of those remote and rural parts of Europe that has difficulty meeting the access needs of schools in the region with broadband only recently coming to the main towns in the county with little chance of its extension outside these towns in the coming five years. This is one of the reasons why Donegal was such an outstanding region to take part in a project to test the

viability for schools to access the Internet via satellite in the European Space Agency (ESA) supported projec. (SchoolSat)

BACKGROUND

In most countries, the Internet is seen as a central component of educational ICT strategy. It is seen as important for a variety of reasons. In part, the Web can be seen as a vast library of resources, some of which can be used by both teachers and students to enrich teaching and learning. There is also an equality dimension to the resource view of the Web, as the smallest and most isolated schools with no library can access exactly the same online material as the biggest urban schools.

The Internet may also be a conduit for a new generation of educational software. For decades specialist software aimed at schools has been produced. Despite the success of the educational software sector in the home and training markets, little of it is in use in schools. The use of software in schools may have been constrained by logistical difficulties including licensing, installing the software, etc. Many of these difficulties can be avoided if educational material is available online, providing an easier solution in school, one that students can continue at home, and teachers can explore in advance with ease (OECD, 2001).

The need for Internet access in school also goes beyond the content of the Web. In part, "the medium is the message," as it becomes important for learners to develop information literacy. Negroponte, in his seminal book Being Digital, describes a "post information age," where individuals have much greater control of the information they receive and send, where they can communicate with agencies in a "place without space," and where they can control more of the information they receive (Negroponte, 1995). This vision of a society with empowered individuals finding information as they need it and managing their own learning and information needs is an attractive one, but it is dependent on learners having the skills to deal with the vast amounts of material available to them.

THE SchoolSat PROJECT

SchoolSat was a pilot project set up in 2001 to investigate the potential of a satellite to provide Internet connectivity for schools. The impetus for *SchoolSat* came from ATiT, a small Belgian firm, which had carried out research on behalf of ESA to identify those school populations in Europe most likely to benefit from satellite access. Putting together a consortium which included the National Technology Centre in Ireland (NCTE), Web-Sat, an Irish-based satellite service provider, and the Donegal Education Centre representing Donegal schools, ATiT applied for and were successful in attracting ESA funding for a pilot project in Donegal which ran from February 2002 to February 2003.

SchoolSat provided broadband Internet access to nine secondary schools in Donegal and the Donegal Education Centre (Who is). Each school was equipped with a small (84 cm) receive-and-transmit dish, connected to a dedicated computer that acted as the satellite gateway connected to the school's LAN and offering the Web-Sat Internet access service with up to 4Mb download to the school and 64 Kbits return. The schools taking part represented just under a third of the secondary schools in Donegal and included every type of second level school in the county, including vocational schools and community schools. The selection also included schools of different sizes, ranging from Carndonagh Secondary school, the largest secondary school in Ireland with about 1,350 pupils to the vocational school on Aranmore Island with just 43 pupils. Within the schools taking part, the teachers selected were also very mixed. They included maths teachers, history teachers, language teachers, physical education teachers, as well as several IT teachers. During the selection of teachers to take part, a conscious effort was made to include a representative group of teachers, rather than to select the most technically skilled. Once the project got off the ground, teachers in the schools taking part were supported in their use of the Internet through a series of workshops and regular contact with one another and the project team through an online computer conferencing system, FirstClass.

One of the first observations in *SchoolSat* was that the satellite system provided Internet access that was considerably faster than the previous access via ISDN (Reynolds, 2003). As the technology is already in commercial use with a range of clients, this observation wasn't a big surprise. But the fact that the satellite system was particularly useful in a schools context was.

When an individual is browsing, ISDN probably provides a reasonably fast response, and the speed of the response is often determined by the delays in the Internet, rather than the bandwidth of the connection from the ISP to the user. Internet connectivity in the somewhat un-

usual environment of schools is different for a number of reasons. One of them is the high concentration of traffic into particular times, which may have marked peaks. Classes using the Internet are likely to involve all students beginning their browsing within seconds of each other, while there may be other times when there is no use at all. In this context we refer to the SIP 069 pilot project where schools were given a computer room and ISDN line dedicated to use of the Internet in teaching and learning. When the project was evaluated in May 2002, teachers reported that sites like Skool (i.e., which were not used because they were too slow), and that "whole class" searching activities were also not viable, because "only the front row could get anywhere" (Mulkeen, 2002).

The faster access that *SchoolSat* provided enabled these kinds of uses of the Internet. In Carndonagh for example, they were able to use the Skool (i.e., a site with 24 students online simultaneously). In Letterkenny, students could all access Hotmail at the same time, while before it used to take weeks just to get them all registered. In Buncrana the school reported that ISDN used to "grid to a halt" once there were more than six or seven computers connected, while they could now use the Internet with an entire class.

The increased speed of access changed thus the nature of usage in the school considerably. From the teachers' and schools' point of view, the satellite system opened up an entirely new way of using the Internet in the classroom. "For the first time," according to Colm Toland from Cardonagh school, one of the teachers taking part, "whole classes can use the Internet at the same time, something, which simply wasn't possible in the past." Students at Carrick Vocational School did not have any access to the Internet due to the lack of access facilities in the area. "*Schoolsat* has given us that access in a very efficient and effective way. Students and teachers can now make use of the wide range of educational material available on the Internet. Students will now be 'Internet ready' when they leave school to attend college or enter the workplace," according to George McMullin, another teacher taking part. All nine schools made valid educational uses of the Internet. In some cases these formed a substantial part of the teaching of a particular subject. A series of different types of activity like project work, reinforcement activities and whole-class teaching were carried out.

In this way, the *SchoolSat* project provided further insight into the question of the use of ICT to encourage a more progressive style of education, with more focus on students learning for themselves.

It has been argued that ICT can act as a facilitator of a swing to this type of teaching and learning, and that it can act as a catalyst for this change. This "catalytic effect" was anticipated in the Irish ICT strategy (1998).

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