National Grid for Learning

One Year On

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Introduction

In the UK, the Labour Government has grasped the potential of Information and Communications Technology (ICT) with its high profile National Grid for Learning and University for Industry initiatives. This report details the development of the National Grid for Learning in its first year from the perspective of the leading supplier of ICT to UK schools - RM plc.

Background

In 1996, The RM G7 Report showed that the UK led the world in the provision of Information and Communications Technology (ICT) in its schools. However, as the report of Sir Dennis Stevenson's Independent Inquiry into ICT in UK Schools states, "this is analogous to suggesting a runner is ahead after 500m of a marathon." One of the key messages of The RM G7 Report was that continued investment would be required if the UK was to maintain, and improve, its lead. Indeed, it is clear that schools must now consider ICT a recurring spend in the same way that businesses do.

There has been an enormous amount of progress in the two years since The RM G7 Report was published. An update to the The RM G7 Report will be published in early 1999 and this will show the extent of developments that have taken place.

The Development of Information and Communications Technology

ICT has developed rapidly. The extraordinary growth of the Internet has been widely reported and analysed. In the context of learning this means that research and communication have been changed, irreversibly, for the better. The widespread acceptance of Integrated Learning Systems demonstrates the dramatic effect technology will have in classrooms in the early years of the next millennium. ICT has the potential to transform teaching and learning in a way unseen since the introduction of mass education in the UK in the 1870s. It has become obvious that the information age will impact education every bit as much as it will the worlds of commerce, industry and leisure.

Political Commitment

The unparalleled learning opportunities offered by technology have been recognised worldwide. As a result, modernising education through the widespread application of ICT has become a political imperative across most of the developed world. There is a global view that successful economies will be both ICT-rich and well educated. These two goals are clearly linked and mutually supportive.

The National Grid for Learning
One Year On

NGfL: A Year of Success

The first year of the NGfL has been a success. By providing the funding required to deliver a sound technical underpinning, working to address the content needs of the educational community and providing training for teachers, the Government has transformed the ICT landscape in UK schools.

At the end of a one-year programme RM alone has connected approximately 25% of schools to the Internet. There are many innovative LEA projects in place that will deliver significant developments over a four-year time horizon. Significant progress has been made in preparing for a roll-out of ICT skills to all serving teachers in the UK and ICT competence is now a mandatory requirement for all newly qualified teachers. Perhaps most importantly there is a supportive climate for the further development of ICT in UK schools.

The NGfL initiative has its roots in the work of the Stevenson Commission - an independent commission of inquiry set up by Tony Blair prior to the 1997 General Election. The brief of the Stevenson Commission was, to advise Tony Blair and David Blunkett on the key priorities and directions the next Government should take in developing the use of ICT in primary and secondary schools. The recommendations of the Stevenson Commission's report have been widely supported and Sir Dennis Stevenson and his associates have set out a clear vision of what must be achieved.

The report set out clear objectives and went on to make a number of substantive recommendations, many of which have become part of the Department for Education and Employment's (DfEE) policy agenda following the Labour Party's election victory in 1997.

The Labour Party's manifesto for the 1997 General Election spoke of a National Grid for Learning and it is this initiative that has become the stem from which all of the Government's learning ICT policies branch off. The first education white paper of the new administration - 'Excellence in Schools'- again spoke of a National Grid for Learning and marked out ICT as an early priority for action.

The NGfL moved from policy objective to political initiative on 7th October 1997 with the announcement of a formal consultation exercise and the availability of additional funds in the Government year 1998/99. The consultation was to be based around the green paper **'Connecting the Learning Society'**.

Connecting the Learning Society set out a number of objectives for the effect ICT should have on teaching and learning in UK schools:

- *"By 1998 plans for the Grid, based on this consultation, should be in the process of implementation;*
- *By 1999 all newly qualified teachers would need to become ICT-literate to mandatory standards to receive the award of Qualified Teacher Status;*
- *By 2002 serving teachers should generally feel confident, and be competent to teach, using ICT within the curriculum;*
- *By 2002 all schools, colleges, universities and libraries and as many community centres as possible should be connected to the Grid, enabling perhaps 75% of teachers and 50% of pupils and students to use their own email addresses by then;*
- *By 2002 most school leavers should have a good understanding of ICT, based firmly on the standards prescribed in the curricula operating in the various parts of the UK, and there should be measures in place for assessing the level of school leavers 'competence in ICT;*
- *By 2002 the UK should be a centre for excellence in the development of networked software content for education and lifelong learning, and a world leader in the export of learning services;*
- *From 2002 general administrative communications to schools by the UK Education Departments, OfSTED and non-departmental public bodies, and the collection of data from schools, should cease to be paper-based."*

The green paper also proposed concrete approaches for building the NGfL:

- *Creating an architecture of content within the Internet - that is, providing excellent content and paths to excellent content for NGfL users. The green paper proposed that the first step toward creating this architecture of content was building a Virtual Teachers 'Centre (VTC).*
- *Implementing a programme for delivering infrastructure to access the Internet in schools. This programme was underpinned by the commitment of £100 million from the DfEE's Standards Fund.*

These two approaches have provided a framework for the activities of the educational ICT community over the past year.

The Virtual Teachers 'Centre

The Virtual Teachers 'Centre (VTC) was established as an early priority of the NGfL. As the name suggests, it is intended to provide teachers with a wide range of materials helpful to their professional development. The job of creating the VTC was given to the British Educational Communications and Technology Agency (BECTa).

Initially, the VTC concentrated on providing a structure for accessing public sector information mainly provided by the DfEE and BECTa itself. During the year, the VTC expanded to include material provided by the private sector - notably RM, BT and Microsoft. In embracing private sector information, the DfEE and BECTa have placed great importance on the need to ensure the material is both acceptable and useful to the teaching community.

Over the year the VTC has been through several revisions. The key priority for future development is the further integration of private sector material. It will not be feasible for government bodies to provide all of the material teachers will want to have available to them. The UK educational ICT industry has shown the ability, expertise and commitment to develop products for education and their efforts must now be harnessed.

A Programme for Equipping Schools The Standards Fund Grant for Educational IT

If content is the real value of the NGfL, it is the availability of equipment that makes this content accessible. The key funding scheme for equipping schools in England is The Standards Fund Grant for Educational IT. Under this scheme an additional £100 million was made available for maintained schools in the UK - 50% coming from Central Government and 50% from LEA funds. An additional £9 million, distributed by the Funding Agency for Schools, was made available for Grant Maintained Schools.

In Wales an additional £3 million was made available for schools to equip themselves to take advantage of ICT. £2.5 million of this was allocated to LEAs on a formula-funding basis and the remaining £0.5 million was allocated to specific projects.

Scotland's NGfL activity is concentrated on a three-year programme starting in Government year 1999/2000. A substantial amount of groundwork has been done during this year, and Scotland is prepared to move forward rapidly when funds start flowing.

The Standards Fund Grant for Educational ICT was allocated to LEAs on the basis of ICT development plans submitted on behalf of the schools they represent. At the time the bidding process took place the additional funding was only confirmed for a single year. Despite this, LEAs were asked to create plans with a four-year time horizon in order to demonstrate their medium-term strategic thinking. LEAs also received strong steering that the majority of the additional funding should be passed to schools, with only a small percentage being used to fund central activity.

LEAs have grasped the opportunities offered by the NGfL and are working to deliver them in their own local areas. The real benefit of the delegated planning approach lies in the diversity of the different LEA initiatives. These are rooted in regional requirements and will result in approaches linked to local needs and local provision.

RM worked with many LEAs during the bidding cycle to offer advice and guidance. The company also has a substantial dialogue with individual schools, indeed, dealing on a one-to-one basis with individual schools has been the focus of RM's business since the late 1980s.

Internet Access in Schools

As a result of the NGfL initative, Internet access in schools has increased dramatically. RM connected an additional 2,000 schools to the Internet in the period April - September 1998. This brings the total number of schools using RM as their Internet Service Provider to over 6,000. Other suppliers have been active in this market as well and RM estimates that more than a quarter of all schools will have connected to the Internet through the company's **Internet For Learning** service by April 1999.

Significantly, a third of the schools RM has provided Internet connections for so far in the Government year 1998/99, have elected to link their complete school network to the Internet. This requires the use of high-bandwidth - typically ISDN - connections, an approach that has been made significantly more cost-effective as a result of OFTEL's successful negotiations with telecommunications providers.

As a result of OFTEL's negotiations, BT has introduced a Schools Internet Caller tariff, which provides ISDN at a capped rate. Cable companies are also continuing to offer preferential ISDN pricing. These ISDN packages are proving popular with secondary schools but are still expensive for primary schools.

Network Infrastructure in Schools

In the UK, the use of computer networks is widespread in secondary schools. The relatively large numbers of computers installed in secondary schools means that networks are the most appropriate method of providing system management. RM has provided networks since the early 1980s and the majority of RM's secondary school customers have chosen them.

Network usage in primary schools has been much less common. Most primary schools have a small population of computers and the management overhead of a network has not been worthwhile.

This pattern has changed dramatically in the year since the NGfL was launched, with primary schools rapidly adopting the network approach. This change has been driven by the requirement to connect all computers in a school to the Internet. The most effective way of doing this is providing a local area network within the school and then linking this network to the Internet - which is the model typically being chosen in new primary school installations.

The Learning Software Industry

A significant output of the **Connecting the Learning Society** consultation exercise was the recognition that the NGfL could be a catalyst for significant growth in the learning software market. This was echoed when the Computer Software and Services Association (CSSA) published the **'Learning Software Taskforce Report'** - an analysis of the UK's position and potential as a world learning software player. A key recommendation of this report was that, wherever possible, the NGfL be used as a springboard to build the UK's learning software industry.

The UK has a well-established community of learning software developers. The UK also has significant strengths in software development and educational content. Another aim set out by Government was taking these strengths and using them to make the UK a world player in the learning software field.

Further work is required if the UK learning software industry is to become a world leader. The elements are all in place, but these need to be brought together into coherent initiatives. There would be real benefit if public and private sectors came together to make this happen.

Managed Services

Connecting the Learning Society suggested that **managed service** relationships between suppliers and schools could be significant in ensuring the success of ICT in schools. It went on to say that, in due course, industry would be 'challenged' to provide the managed service products schools would need to succeed with ICT.

The Challenge Document has only just been issued. Nonetheless there has been significant development in the managed service approach in the context of educational ICT. A number of individual schools are experimenting with various forms of outsourcing with generally good results. On a larger scale, Tynemouth College has outsourced all of its ICT provision to RM in the first contract of its kind in the UK.

Perhaps the most significant development has been the **Dudley Grid for Learning**. RM was awarded preferred bidder status for this project in September 1998 after working with Dudley Metropolitan Borough Council for 18 months. This PFI pathfinder project will result in all of Dudley's schools ICT activity being transferred to RM. RM will provide equipment, support, management and development over a ten-year period. RM has also been awarded a contract to provide a long-term managed service in South Lanarkshire.

It remains to be seen whether large-scale managed service projects will become more widespread. However, it is clear that the lessons learned from this kind of project will provide a wider choice of better quality ICT services for all schools.

Looking Ahead

The Government's commitment to educational ICT has been reinforced by announcements of further funding. In August 1998, the Scottish Office announced a three-year, £62 million programme to build the NGfL in Scotland. On the 1st October 1998, David Blunkett announced £105 million in the Government year 1999/2000 for the NGfL in England, with further, increased amounts pledged in 2000/01 and 2001/02. It is clear now that the NGfL is a four-year, funded programme.

RM predicts that by the end of the four-year NGfL programme, all schools will have Internet access and, in the majority of schools, this will be network-wide Internet access. Computer to pupil ratios will have improved significantly, especially in primary schools, and the capabilities of the equipment pupils have access to will have developed dramatically. Most importantly, the confidence and competence of teachers to integrate ICT into their classroom approach will have developed dramatically.

Beyond the National Grid for Learning

After 2002 ICT will continue to significantly impact the lives of both educators and learners. In many ways the NGfL is no more than a start and RM believes that the benefits it demonstrates will significantly increase the underlying demand for educational ICT.

For the foreseeable future, schools will still need strong guidance if they are to build on the developments and practices established as a result of the NGfL. Clearly teachers will continue to be the driving force of education and ICT can only enhance their role. However, if UK education is to meet the challenge of the Information Age, technology must be harnessed to deliver the following:

- **ICT must become a mission-critical element of the fabric and structure of education establishments.**
  Indeed, for many education establishments it already is. Education establishments will need to plan the procurement and management of ICT in a more rigorous fashion. A typical school currently spends less than 1% of its budget on ICT but this will rise to between 3% and 4% in the early years of the next millennium.

- **Educators must make much wider personal use of ICT.**
  The education profession (teachers and lecturers) has largely missed out on the benefits offered by ICT. The increasing personal ownership of computers, combined with the Government's drive to increase the use of ICT for education administration will fundamentally change this situation.

- **The use of ILS to develop core skills of literacy and numeracy should become commonplace.**
  The results achieved with early generations of these products are so compelling that it is clear that they have a major contribution to make not only in literacy and numeracy but also in other curriculum areas.

- **Schools must take into account the growth of personal ownership of technology products.**
  The availability of computers in homes is increasing steadily. We will soon reach a point where this can be exploited as a resource in school planning.

- **The Internet will become the single most significant information source available to school pupils.**
  The amount of information available on the Internet is increasing exponentially. In the same way that the industrial revolution created a need for manual skills, the information age will create a need for knowledge skills. The ability to confidently manipulate complex information will become, in itself, a core skill with the same level of importance as literacy and numeracy.

- **Home and school learning environments must grow together as pupils increasingly complete learning assignments using ICT.**
  The technology already exists for pupils and teachers to connect remotely to the school network and widespread personal use of technology will force educational establishments to make use of it.

- **Geographical barriers in learning will be broken down by ICT.**
  Technologies such as video conferencing are already having a significant impact on language learning. They will be increasingly used to provide distance learning for pupils living in isolated areas. Electronic communications will also be used to allow learners to take courses not available at their local learning establishment.

Connecting schools to the National Grid

Northants LEA

All schools in Northamptonshire LEA's district were required to draw up a four-year ICT plan in order to receive their share of the Standards Fund money. This year Northants LEA elected to use the money to provide mainly primary schools with RM SchoolShare[a] (shared printer and Internet access) facilities. In line with the NGfL, the Internet and ISDN line were considered essential items and were supplied as standard to each of the 148 schools in the county receiving funds in the first phase. The remaining schools will benefit from successive rounds of funding and the aim is to connect all schools via the Internet to County Hall by 2001, linking both curriculum and administration networks.

Northants LEA moved quickly to put a strategy in place as they felt the whole year was needed to put the solution in action. Their chosen IT partner was RM because, as Barry Newman of Northamptonshire Computer Education Centre puts it, "RM is the only company that offers a real education solution to the problems of ICT in the curriculum. Others don't have the back-up services so there is no true competitor." Only 5 schools out of the initial 148 have not chosen RM.

Because the size of the primary schools in the county varies greatly, Northants decided on a variety of solutions. These ranged from providing single RM Window Box[a] computers, which come ready configured with software tailored to cover the National Curriculum, in the very small schools, to larger 8-station RM SchoolShare networks in the bigger primary schools. They also supplied 7 secondary schools with embryo networks and assisted two primaries in turning their existing RM SchoolShare systems into full RM Primary Networks.

An important aspect of Northamptonshire's NGfL solution has been the provision of training to help teachers use ICT in the classroom. Courses are mainly based around the RM Window Box and cover topics such as Talking First Word, Introduction to the Internet and Supporting Children's Learning through IT across the Curriculum. Courses have also been run which concentrate on the QCA Scheme of Work, covering cross-curricular tasks teachers can use in the classroom and providing a framework on which teachers can build their own schemes of work.

The idea behind both the training and the general strategy is that all the teachers in the county will move forward together, receiving the same training and opportunities. Meadowside Junior is one primary school that was lucky enough to receive a large grant from the LEA. In response to the LEA the school drew up a comprehensive development plan so they now know where they want to be in two or three years time. With the Standards Fund grant, the school was able to purchase an RM SchoolShare system of 8 RM Window Box computers and added a further 2 computers using their own funds. They already had two older RM Window Boxes which they were more than happy with. Headmaster, Martin Webb, said "The reliability of RM products has been remarkable. The RM Window Boxes don't even seem to be affected by chalk dust".

The school is delighted with the RM Window Boxes and with the opportunities the system gives for whole-class teaching. At present in a class of 30 children they are able to provide one computer between three children although they hope to bring this down to two children by phase 2. Martin Webb said, "Grouping computers together must be the way forward for schools. Whole class teaching is necessary to combat one of the biggest problems in using computers, that of ensuring equality of access for all children". He felt that using ICT for whole-class teaching was necessary to achieve continuity and progression.

Martin Webb also hopes to develop stronger links between the school and the community at large, allowing parents and children to use the computer system out of school hours. He emphasised that although at present they still have concerns about security and supervision of the computer room out of school hours, he felt that the role of the school into the next millennium would be providing the social 'glue'.

Montsaye Secondary School was among those schools to receive a smaller grant. However, this enabled the school to purchase an RM ISDN2 link and router which they might otherwise not have afforded this year. This allowed one room that already had an RM Connect network of 22 computers to be connected, to gain multiple access to the Internet.

On top of this the school bought a smaller RM Connect network of 10 computers and an extra router which they installed in the sixth-form suite, as well as setting up an extra Internet link in the library. They plan to expand this in the near future. By connecting to the Internet using RM's Internet For Learning, the school does benefit from a secure filtering service. However, the school also plans to put together a code of practice as the size of the school requires that a lot of the responsibility for sensible use of the Internet is put onto pupils themselves.

The school now has four large networks and the smaller network in the sixth-form block. These are all already busy most of the school day and are also used out of school hours for community activities such as Adult Education.

Connecting to the National Grid for Learning

Kent LEA

When the Standards Fund was announced last autumn, Kent LEA thought long and hard about the kind of resources they wanted to make available to their schools. For phase 1 they decided on a 'portables' solution, which would provide notebook computers to nearly all of the schools in their Authority in the first year. A large proportion of the primary schools in Kent have selected the notebook route, covering a wide cross-section of schools. In addition, 20 per cent of schools received extra resources or are trialling more complex systems; for some this involved supplying multiple, rather than single, access to the Internet.

Following a tender process, Kent LEA, one of six pathfinder authorities on which the DfEE will be carrying out an independent report, chose RM as their NGfL partner. Peter Banbury of Kent LEA said, "We chose RM because it is a company that is in touch with schools. Without that understanding teachers can feel let down if the systems do not meet curriculum needs". He explained how they were looking for a company that had developed curriculum based solutions, offered good support and could provide value for money.

Teachers were keen to have the same software on their notebook computers as they already had on their classroom RM Window Box computers, so each RM NoteBook comes ready configured with a selection of curriculum software from the RM Window Box. Each RM NoteBook also contains Living Library, RM's on-line reference source and is connected to the Internet via RM's Internet For Learning service. One of Kent's essential criteria was the level of support that RM would need to provide to the teachers. To this end, they agreed on a two-year warranty for each RM NoteBook and extended out-of-hours hotline support to help the teachers familiarise themselves with the RM NoteBooks when they weren't teaching.

Kent LEA also required that every RM NoteBook could be connected to the television so that teachers could use their RM NoteBooks for whole-class teaching. Carole Dellaway, the IT Co-ordinator at All Saints C of E Primary School in Maidstone, has plans to take advantage of this as part of the Literacy Hour. Her school has also recently installed 15 networked RM Window Boxes which they are leasing over five years. The school already had several older RM Window Boxes which they were happy with and Carole Dellaway was impressed by the fact that RM was prepared to act in a purely advisory role and also with the customer care the company offered.

Each RM NoteBook computer is being used in the autumn term by teacher 1, often the school's IT Co-ordinator. Kent LEA is providing a comprehensive training programme and the intention is that this teacher will use the RM NoteBook in lesson time and at home for professional development. They will also pass on their experience and training to other teachers in the school. Teacher 2 will follow the same programme in the spring term and it is in this way that Kent LEA plan the use of ICT to enhance teaching and learning will take root within schools.

In addition to the basic training, Kent LEA is providing a range of curriculum training and support activities to stimulate the use of ICT to enhance teaching in the classroom. They have also begun developing material on their web site that teachers can use to integrate ICT into their lessons. A number of teachers have been involved in this process, one of whom is Jo Leech of Sellindge Primary School. She has worked with other infant teachers to develop an interactive big book story as part of a website for infants that contains activities children can actually carry out on screen.

The story, which is based around a swan called Sebastian, stimulates the use of communication through email and provides a whole range of support for Key Stage 1 teachers. It is a good example of the use of ICT to support the Literacy Hour. The Infant Explorer site which was designed specifically for teachers to use with their laptops, can now be found on the Kent NGfL web site. Jo Leech has already used it with her class and was delighted with the enthusiasm and results it generated. She plans to develop a different big book story every term.

One of the reasons behind Kent's strategy to supply RM NoteBooks was the DfEE portables scheme, which showed that teachers quickly developed confidence and competence in ICT when given portables. They were also influenced by the success of the Kent Broadband Learning Project, a partnership of schools and educational organisations, of which RM was one, that was set up in the summer of 1995 to research the practical curriculum use of ICT.

Kent's experience of this showed that successful curriculum use of ICT on a small scale fuels a demand for more resources and that schools subsequently increase the priority given to ICT. A large number of schools have taken advantage of the preferential bulk purchase deal Kent LEA agreed with RM, to purchase their own additional equipment and services. Kent LEA consultants are certain that the NGfL Initiative has raised the profile of ICT and increased the amount that schools are spending on ICT resources.

A National Grid Solution

Dorset LEA

Dorset's NGfL solution was different from many other Local Education Authorities in that they decided to connect the administration and curriculum networks within all 172 of the county's schools via the same ISDN line to the Internet and County Hall at an early stage. At the same time, however, they wanted to maintain the security of the administration network and this was done using RM's ISDN2 with dual port routers.

By the end of the first phase, some 87 schools will have been connected to the Dorset Grid and Dorset hopes to have the remaining 85 schools connected by summer 1999. The majority of the phase 1 schools are primary but there are also several pyramids of schools consisting of the feeder first schools and their appropriate middle and upper schools. These pyramids offer exciting opportunities for inter-school projects and activities.

When explaining the thinking behind their solution and appointment of RM as Dorset's NGfL partner, Mike Tunbridge, Systems Development Officer at Dorset LEA, said, "The only company that really cottoned on to our scheme was RM".

In addition to ISDN2 and RM's Internet For Learning (IFL) service, RM will be providing the secure link between the schools and County Hall, creating a virtual private network. This innovation is a significant step in the long-term objectives of the NGfL and will ultimately allow the LEA and its schools to communicate solely via the Internet, sending resources, reports and other confidential information via the ISDN line.

RM is also providing EasyMail for both office and curriculum access, supplying email addresses for every teacher in every school. EasyMail allows teachers to pick up their mail from any computer in the school as well as access their account at home. All schools receive unlimited web space for publishing their own projects as well as a single subscription to the Living Library.

A substantial number of schools in the Dorset area had already begun experimenting with the Internet and have impressive web sites in place. One such school is Loders, a very small primary school that began with a single dial-up account and whose web site combines information for parents and teachers with pupils' own contributions. Previously schools had subscribed to a variety of different Internet providers. Dorset are convinced that the installation of the RM Internet For Learning service throughout the county will 'create order out of the chaos' and are excited about the possibilities the RM system will allow them to explore.

Because Dorset is primarily rural, the LEA had to approach its NGfL solution differently. Not only are many of the county's schools very small but they are also spread out and not easily connected as many inner-city schools are. Dorset County's web site already contains some curriculum based resources teachers can refer to and is full of handy links to other educational sites.

The county's NGfL solution has also coincided with the setting up of an LEA-wide intranet which is due for launch shortly and this will be used to communicate with schools and to send and receive a wide variety of materials. Connecting both the administration and curriculum users to this intranet will provide the ideal opportunity to link the schools, making them feel part of a wider community and offering them the chance to share resources and experience.

At the same time as installing Internet connections, Dorset has also encouraged schools to improve or update their existing computer systems. Although schools were able to purchase additional equipment from other suppliers, a substantial number of schools have opted to follow the RM route. Interestingly, all but one of the 17 schools within the Dorchester pyramid have chosen RM kit and this will obviously carry important advantages in terms of inter-school activities and support.

In addition to the work taking place to build the LEA-wide intranet, development is well under way on the kind of information and curriculum material that will be available through this medium. Some of this can already be seen on Dorset County's web site. Dorset has appointed two school effectiveness consultants who will provide support in terms of training and the provision of teacher resources. Other members of the School Effectiveness Service will be increasing their contribution in this rapidly developing area. They will be working with individual schools to help with their ICT planning and the development of ICT schemes of work. Dorset aims to show that ICT is an essential plank in raising standards in education and to demonstrate how the NGfL can contribute to the most effective use of ICT in the classroom.

Information and Communications Technology

A Historical Perspective

There is a long tradition of ICT usage in UK schools. From the initial experimentation of the 1960s, moving through the early arrival of microcomputers in schools in the late 1970s and on to embracing the Internet in the 1990s, the UK has been at the forefront of ICT developments in education. It is a result of the vision of various Government administrations and the innovation of the private sector that we have achieved so much.

A History of Partnership

The development of educational ICT in the UK has been the result of 21 years of highly effective public-private partnership. Central Government has provided strategic guidance along with enthusiasm and seedcorn funding. Local Government has embraced these strategies and implemented them with clear, forward-looking planning and tenacity. In all of this, the public sector has been supported, and often driven forward, by the innovation of the educational ICT industry.

The commercial companies that lead the market today are the same as those that started the industry 21 years ago - RM plc and Xemplar (the successor to Acorn Computers). RM and Acorn were the first companies to deliver microcomputers to UK schools in the 1970s and, as a result of many generations of development, have ensured schools have been able to move their ICT investments forward.

This development path has been extremely important in allowing the UK schools community to continue moving forward, essential in an area developing as rapidly as ICT. Other nations have adopted an approach of major, heavily funded projects followed by stagnation. As far as possible, RM has presented its customers with a straightforward development path that builds on existing investments. This approach of ‘evolution through evolution’ has worked well.

Three Phases of Development

Looking back at the twenty years of microcomputer use in education three distinct phases can be identified:

- **1 - Learning about ICT**
  Teaching students how to operate ICT equipment.

- **2 - Learning with ICT**
  Using IT tools within an existing educational framework, to do the things we were doing anyway. Most current use of ICT has stopped here.

- **3 - Learning through ICT**
  Using the capabilities of ICT to transform the teaching and learning approach. A good example is the use of ILS to improve numeracy skills. This is the future of ICT in schools.

RM believes that history will show that the third phase - Learning through ICT - will be by far the most important. ICT has the capability of transforming - irreversibly and for the better - the education process. The technologies that are in their infancy today - Integrated Learning Systems (ILS), the Internet and educational simulation - will have a far reaching effect on the way learning is consumed and delivered in the next millennium. It is no exaggeration to suggest that ICT will change learning as fundamentally as the arrival of mass education did in the late 18th Century or even the arrival of printing in 1440.

Integrated Learning Systems (ILS)

An ILS can be seen as a power tool for educators in the sense that it amplifies the personal skills and effectiveness of the teacher. A product such as RM Primary Maths Learning System provides teachers with diagnostic and assessment information and the learner with individually tailored, stretching mathematical exercises. The enormous benefit of the ILS is that it allows the teacher to do what they are uniquely good at - solving learning problems - and it gives them high quality diagnostic information to work with.

The ILS is very much at the beginning of its development. However the results are already impressive with a number of independent research exercises showing real learning gains. There is little doubt that the ILS approach will form an increasing part of the teacher’s repertoire in the next few years.

The Internet

The Internet has at least two transforming contributions to make to education - these are in the areas of *research* and *communication*.

The impact of the Internet on research - at all levels of education - will be enormous and far-reaching. The arrival of the Internet means learners will have access to extraordinary quantities of raw information. This access to raw data brings with it a requirement to change the way information is used in education. Interpretation, and the ability to synthesise a point of view from a range of

disparate, sources, will become more important than remembering facts. The impact on educators will, necessarily, be both subtle and profound.

In the area of communication the Internet breaks down barriers in ways that existing telecommunications cannot. Examples of class groups communicating with their peers in foreign countries are now commonplace. Typically this is done using electronic mail, but increasingly Internet video conferencing is being used as well. Through its relatively low cost, Internet communication is playing a significant role in bringing language teaching alive.

Simulation

Simulation is already a widely used technique in professional training. Flight simulators or simulations of complex chemical processes are well understood.In the context of the classroom, ICT allows students to experience things it would be impossible to experience in any other way. This might be laboratory experiments that are too dangerous or expensive to do in the classroom, or it might be simulations of economies or cultures.

The use of ICT simulation techniques, particularly the emerging field of virtual reality, allows learners to experience things in a controlled and safe environment.

ICT training for teachers

Last year the Government announced that £230 million of Lottery money would be made available for a three-year programme to train all 500,000 serving teachers and school librarians in the UK on the use of ICT in classroom teaching. All teachers will be entitled to some training. As the leading supplier of ICT to UK education, RM has long advocated a need to increase teacher training in the use of ICT to enhance subject teaching and was pleased by the Government's plans to address this issue.

The Lottery White Paper stated that the Lottery-funded training would: focus on helping teachers to use the technology in the classroom to enrich teaching and learning and raise standards - right across the curriculum.' The New Opportunities Fund (NOF) was set up in July 1998 to administer the programme and will announce those training organisations that have gained approval in February 1999. Schools will be allocated funds on the basis of the number of Full Time Equivalent Teachers they have and will be able to choose from a selection of approved training providers. The schools themselves are then responsible for their teachers achieving the required standards, which broadly correspond to those expected of students training to be teachers as of September 1998.

The Learning Schools Programme

To address the issue of teacher training, the Open University and RM have launched 'The Learning Schools Programme', a co-operative venture that will provide high quality, curriculum-centred training on the use of ICT in subject teaching. Central to 'The Learning Schools Programme' is the development of a three-way relationship between the OU, the largest trainer of Post-graduate teachers in the UK, RM, the country's leading provider of ICT solutions for schools, and Local Education Authorities and schools. This will provide the best combination of national and local initiatives and expertise.

The Open University is the UK's largest teaching institution and a world leader in open and distance learning. It is the largest provider of initial teacher training through its award-winning teacher training programme and, since 1971, has provided continuing professional development for in-service teachers. As such, it will bring established best practice and academic research in pedagogy and curriculum development to the partnership, as well as a proven track record in Continuing Professional Development and the latest techniques in Open Learning.

The Partnership with the LEAs is important as they will provide the local support to the training initiative, building on their existing professional development programmes and understanding of the needs of the teachers in their schools. Schools will provide the local context and focus for the training.

RM's contribution to the project will be the company's expertise on how to apply the latest ICT advances to education as well as knowledge and experience of the best practice in schools. RM already offers a number of training opportunities and works with almost 10,000 teachers a year to improve the use of ICT in the curriculum through integrated training packages offered as part of products such as RM Window Box and RM Connect. In addition, the company stages a large number of seminars for both secondary and primary schools each year. These seminars are attended by senior managers and head teachers from schools throughout the UK and are intended to provide an open forum on the major issues on ICT in education and a preview of future issues and technologies.

Building on Teachers' Existing Skills

The government's decision to make lottery money available for training teachers in ICT has generally been welcomed throughout the education sector. However, it needs careful management and thought to ensure the best and most effective training possible is delivered to the teachers. The Open University and RM have chosen to work with LEAs to deliver their training using a school-based, supported, self-study model. This aims to build on each teacher's existing skills in the context of their school's ICT provision and to allow teachers to work at their own pace on materials that meet their own needs.

The increasing use of ICT in the classroom can only mean significant changes to the traditional methods and practices of teaching and learning. Teachers need to critically assimilate these new methods of teaching over time and to be provided with the basic tools to apply ICT appropriately to teaching as it develops in the coming years.

Glossary

BECTa
British Educational Communications and Technology Agency, the Government agency tasked with developing the use of ICT in education. BECTa is the successor organisation to the NCET.

DfEE
Department for Education and Employment, the Government Department responsible for education.

ICT
Information and Communications Technology, computers and communications software, services and systems.

ILS
Integrated Learning Systems, sophisticated learning software typically designed to support core skills learning.

ISDN
Medium / high bandwidth digital communications service.

NGfL
National Grid for Learning.

VTC
Virtual Teachers Centre, a Government controlled web site offering useful support and professional development material for teachers.