

INTRODUCTION

IMPROVEMENT OF NATIONAL SCHOOLNETS IN EUROPE

Definitions of Schoolnets

Networks are an increasingly important feature of contemporary life. Modern organisations understand their importance for innovation and knowledge exchange. Across all sectors, networks are becoming a key organisational principle, so that within the education sector it is now recognised that organisational isolation inhibits learning.

No matter how simple or complex these networks are, there is a requirement for appropriate levels of technical support and management. The management of a network includes maximising availability of the services from a technical point of view and promoting good network practice. The successful management of a network ensures that ICT systems support rather than interfere with good teaching and learning opportunities.

There are now many schools internationally that are benefiting from working together as a network. According to the DfES (2004) there are four things that effective school-based networks do

1. designed around an idea or specific purpose
2. focus on pupil learning rather
3. create new opportunities for learning
4. run and have dedicated leadership and management

The technical heart of a Schoolnet is the networked computer linked to the Internet. It not only shares information with other computers, but also offers the power to communicate with others around the world. This offers a range of benefits to learning, management and deployment of resources by:

- connecting people by synchronously and asynchronously by for example email, forum, chat and conferencing
- providing access to the resources and the World Wide Web
- helping to combine administrative and curriculum functions across schools
- sharing data and application software
- simplifying management by having central and remote maintenance usually managed by a service provider

At this point, it is worth considering some different aspects of Schoolnets around the world. In Canada, the Schoolnet project (<http://schoolnet.ca/home/e/whatis.asp>) is a governmental partnership with the education community and the private sector, which promotes the effective use of information and communications technologies (ICT) in learning. They seek to help administrators, educators and students achieve extraordinary results.

Schoolnet Africa (<http://www.schoolnetafrica.net/>) stands for the right of all African youth to education and lifelong learning possibilities, so that every African child has the right to have access to information by creating affordable and sustainable access to ICT in African Schools. Schoolnet Africa also provide African education content on the Internet with the development of online content in local languages.

In Europe, European Schoolnet is the framework for the co-operation between the European Ministries of Education on Information and Communication Technology in Education and the European network of national, regional and local educational networks (http://www.eun.org/eun.org2/eun/en/About_eschoolnet/).

As a result it developed as an international partnership of more than 26 European Ministries of Education developing learning for schools, teachers and pupils across Europe in order to provide insight into educational uses of ICT (information and communications technology) in Europe for policy-makers and education professionals.

So Schoolnets operate with different goals and in different circumstances. However, a key principle in the formation of Schoolnets is that they require networking of people and computers to enable communication. By using a computer networked to the Internet as a tool, teachers and learners can gain access to an immense number of resources and to communication and contact with other people across the world.

Schoolnets and policy in Europe

There are a wide range of policies influencing the use of ICT and Schoolnets in Europe. Several actions adopted by the European Council since its Lisbon 2000 meeting (Stockholm 2001, Barcelona 2002) in the endeavour to set up a European knowledge area demonstrate the significance of Schoolnets across the whole European Union. The meeting in Lisbon in 2000 was about setting up learning partnerships between schools, training centres, firms or other educational resource centres. Schoolnets thus promote active partnerships between schools. Stockholm in 2001 sought to encourage mobility by helping schools, teachers and pupils to get to know one another and take part in exchanges and multilingual dialogue,

In 2002, the Barcelona meeting highlighted improving the mastery of basic skills, in particular language learning, and developing digital literacy. The active use of the Internet and information technologies by active learning

approaches were said to encourage pupils learn how to handle informatics tools which they can then use on a life-long basis to acquire skills. By then promoting the European dimension in education and integrating it into pupils' activities encourages networked cooperation on educational projects between schools.

The European Commission launched in 2000 the e-Europe initiative (Commission of the European Communities, 2000). The key objectives of the e-Europe initiative are:

- to bring every citizen, home and school, every business and every administration into the digital age and online;
- to create a digitally literate Europe, supported by an entrepreneurial culture ready to finance and develop new ideas;
- to ensure that the whole process is socially inclusive, builds consumer trust and strengthens social cohesion.

To achieve these objectives, the Commission proposes joint actions to be taken by the Commission, the Member States, industry and the citizens of Europe on ten priorities.

- Bringing European youth into the digital age
- Cheaper Internet access
- Accelerating e-commerce
- Fast Internet access for researchers and students
- Smart cards for secure electronic access
- Risk capital for high-tech SMEs
- e-participation for the disabled
- Healthcare on line
- Intelligent transport
- Government online

(<http://europa.eu.int/scadplus/leg/en/lvb/l24221.htm>)

European Union policy about Education, Training and Youth supports the development of networking of schools, colleges and institutes of higher education. (<http://europa.eu.int/scadplus/leg/en/s19000.htm>).

There is currently great interest in technology supported learning (e-learning)., especially since the adoption of the eLearning Action Plan (Commission of the European Communities, 2001). During 2002, the eLearning Action Plan played an important role in helping to co-ordinate European activities concerning the use of ICT in education and training. Most national action plans reference it as a source of guidance and action. So do a range of EU policy documents and initiatives, as e-learning is increasingly seen as a useful tool for achieving better access to lifelong learning and education for all.

The main priorities being the improved provision of infrastructure and equipment, issues of quality, content and services, training at all levels. as

well as developing effective European co-operation and networking. Co-operation and networking remain central to the Commission's work under the eLearning Action Plan to co-ordinate Europe's activities on e-learning. One of the strengths of ICT and the Internet is that they facilitate new forms of partnerships between diverse actors, broadening and deepening support for learning. So with so many activities taking place in Europe, there is an increasing need for support to bring the actors together, to share experiences, to exploit synergies between projects and to foster the development of best practice, resulting in increased co-operation and networking.

The eLearning Action Plan (Commission of the European Communities, 2001) suggests that access to infrastructure will be facilitated by the development of multipurpose, networked places of learning which are accessible to all, and by the development of a suitable virtual infrastructure. The creation of multilingual portals on the Internet will be encouraged, in order to allow structured and user-friendly access to existing resources.

The European Commission considered that the Internet could be a major catalyst in intensifying the cooperation already under way among schools (Commission of the European Communities, 2002). It believed that by the end of 2006 all secondary schools in Europe should be in a position to twin up and work on joint educational projects via the Internet. Internet twinning was thus defined as the use of multimedia and exchange tools (email, videoconferencing, joint development of websites) to set up links and cooperation between schools. Such twinning necessitates an overarching framework for cooperation between schools, in particular the organisation of periodic meetings and exchanges, the development of joint projects and materials, plus regular contacts to enrich project actions and activities. Such an Internet twinning scheme fits in well with the European vision of mobility, whereby every young European during their time at secondary school can participate in an educational project of their choice.

European policy has also shifted to encourage multilateral cooperation between universities and training centres in the European Union and many countries around the world. The European Commission supports these links with third countries through a range of programmes (http://europa.eu.int/comm/education/policies/cooperation/cooperation_en.html).

There are many other policies relating to the use of ICT and the Internet, but perhaps the most important relating to Schoolnets is that relating to Internet Safety. With the rise of networking and increased inter-connectivity, the issue of Internet safety has become of major significance in Europe and in all EU countries. In 2004, the EU Telecommunications Council today agreed on the Safer Internet Plus programme, which aims to empower parents and teachers with internet safety tools. The 4-year programme (2005–08), proposed by the European Commission will seek to combat illegal and harmful Internet content. It focuses closely on end users, namely parents, educators and children.

What do Schoolnets contain?

Thomas and Williams (1999) suggest there are three main uses of the internet for schools, these are communicating information, obtaining and sharing resources and publishing educational materials. The examples that follow illustrate these points and the tools that have been used.

The UK Department for Education and Skills (DfES, 2004) has acknowledged, from the recent experience of schools involved in learning networks, it is clear that schools working together can add significantly to teachers' professional development and children's learning in order to raise standards. Schools involved in networks have seen that networks:

- broaden the teacher expertise and learning opportunities available to pupils
- provide a direct mechanism for sharing expert teacher practice
- provide the diversity, flexibility and range of opportunities that no single school can offer
- nurture creativity, risk-taking and innovation to improve learning and teaching
- lead to improvement in pupils' attainment
- lead to improved teaching

(http://publications.teachernet.gov.uk/eOrderingDownload/nlc_cdc_wawla02_01_Establishing-a-network-of-schools.pdf)

Some of the typical components of on-line Schoolnet Web developments might include syllabus materials and content, email and forum, links to World Wide Web resources, presentations, tutorials, blogs, technical instructions, pupil activities and online registration information. Research on network-based school activities as part of My Europe community in European Schoolnet shows that communication and conferencing are the most used tools (70%); in particular asynchronous activities through bulletin boards (67%), community email (66%), discussion forum (64%), and chat (45%). Other tools like file uploading (66%), file sharing (62%) and link lists (61%) are also used often. Many of those involved indicated that they would like to publish the results of their work and give more time to sharing activities, if only they had more time to do so

(<http://myeurope.eun.org/ww/en/pub/myeurope/home.htm>).

More than half a million children in 34 countries participated in the SchoolNet Global online curriculum projects. The pupils created a resource of more than 55,000 unique and individual web pages about their lives, their families, communities and environment. The facilities provided included teacher support including project guidelines, curriculum guides, lesson plans and sheets for pupils to get them started. Pupils get templates to guide their research and optimise their creativity and productivity. They submit their pages to their teachers and mediators who check their work online and then publish it on the site. The site allows them to review and refine their work. They also have tools to talk to their peers in other countries by iChat and Video Conferencing (<http://www.intuitivemedia.com/>).

Schoolnets are thus able to provide a personal online learning space, where learners can store everything related to their learning and achievements, including resources, activities, homework, research, and tools for preparation, planning and collaboration. As it online, the learning space is accessible from home and school.

Who is involved?

Schoolnets involve a range of user groups where the use of ICT either enables or enhances learning activities. Teachernet (2005) suggests the following groups benefit:

1. **Learners**, Schoolnets can make learning customised to individual needs, new technologies allow a more exciting, enjoyable and interactive learning experience with the flexibility to study where, when and in the ways best suited to individual needs and preferences. increased motivation through learning that stimulates, stretches and takes into account prior and concurrent experiences in and out of school
2. **Parents** can become better informed, active participants in their children's education through improved access to information and guidance and the safe use of the Internet for learning. They are able to become members of the school community, with easier communications with school staff, their children and other parents
3. **Teachers and support staff** can have better access to professional development, with access to a range of advice, guidance, support and resources that support the preparation and enrich the delivery of lessons. They can also get information on their pupils to help the setting and tracking of individual learning goals;
4. **School head teachers and managers** can benefit from a more efficient information flow to make better informed decision-making. They can improve their specialisation and enhanced professional collaboration within and between schools and regional and national educational organisations. They can also create an enhanced community learning presence and more dynamic communications with parents.
5. **Schools** are able to create a community for project activities.

The creators of Schoolnets can be user groups, or more often they are organisations seeking to improve educational connectivity. This normally involves a partnership of providers (Internet services, computer equipment and curriculum content). It often also includes administrative organisations such as regional and national government organisations.

What research has been done about Schoolnets?

Networks linking schools have been established for many years, for example the educational system of Latvia has implemented infrastructural planning since 1985 (Kangro and Kangro, 2004). More sophisticated networks are being set up throughout Europe and are experiencing rapid growth. For example, when the Hellenic School Network was set up in 1999, it consisted of 800 schools out of 3767. They, all, had computer equipment and networked infrastructure. By the end of 2001, this number had radically increased to 2116 schools (Retalis, 2001). Yet even after many years of national policies and investment in ICT, technology is still an imposed activity and not integrated into the pedagogy of schools. The use of computers is often perceived as a catalyst for change, changes in teaching style, changes in learning approaches, and changes in access to information. It is nevertheless still rare that teachers and schools are able to cope with such innovation. Tearle (2003) addresses the question of why some schools have managed to introduce widespread use of Information and Communications Technology (ICT) into teaching and learning across the curriculum, where other schools have had much less success.

As the knowledge society becomes more ubiquitous, education needs better professional knowledge about the management of schools and effective teaching and learning (Hargreaves, 1999). McCormich (2004) comments that although the technologies may yet have to reach maturity to become reliable and easy enough to use in schools, technology educators must be prepared to exploit the learning potential. Haaksma-Oostijen and Puper (2003) provide an overview of the use of ICT in Dutch secondary education. They comment on the changes necessary in the roles that teachers in the Netherlands need to perform in the networked society and the importance of training and professionalisation of teachers. Watson (2001) comments however that no clear role has emerged in education.

Rapid growth and improvement in ICT has led to the increased use of computers in education. Studies suggest that the use of technology under the right circumstances improves learning, however many educators believe that a new pedagogy that incorporates technology is necessary to prepare students for work in the computer network age. Research from the Pisa study (OECD, 2000) suggests that while secondary school students regularly use computers to obtain information from the Internet and to communicate with others, their main school-related activity is word processing. Almost as many students used computers for playing games as for word processing, and less than one-third used computers to help them learn school material. Further research is required to investigate the contribution of ICT to educational outcomes and the importance of ICT skills in the new economy.

Despite much research activity in trying to understand the use and benefits of ICT there remains little or no research on the outcomes and activities of Schoolnets. Even though major Schoolnet activities have been implemented in most countries few studies of the actions and activities are published in the literature. The exception is the study undertaken by Leask and Younie (2001),

who reported on issues that emerged from research being undertaken through 'The Learning School' Project, which was part of the European Schoolnet (EUN) Multimedia Project.

They commented that the concepts work underpinning the project drew on experience from many earlier European projects, including the Thematic Network for Teacher Education in Europe (TNTEE), the T3 initiative and a number of Socrates projects, as well as teacher professional development initiatives and websites in the United Kingdom and Australia (e.g. TeacherNet United Kingdom, Mirandanet, the British Council Montage project). Some of the schools involved had taken part in the EU funded 'Web for Schools' initiative (1996-1998). Other innovative schools were involved in EU funded Comenius initiatives using electronic means to support international school links as well as being involved in innovative projects in their own countries. It is acknowledged that the concept of 'On-line community' is open to many interpretations. In this article, we use the concept simply to refer to web provision which is interactive and facilitates contributions from a recognised 'community of users', i.e. teachers in Europe.

Leask and Younie (1999, 2001) have also provided an analysis of European Schoolnet as an online community. They stated that the perceived added European value related to changes in pupil attitudes, curriculum enhancement and professional development of teachers. European Schoolnet provided resources and opportunities to develop a shared sense of what it means to be European. Teachers identified four main aspects that EUN enhanced, these were:

- Opportunities to find partners for collaboration
- Disseminating ideas for curriculum projects
- Opportunities to post a school's own ideas for projects and ask for partners and
- The provision resources for lessons relating to existing projects.

So, European Schoolnet provided an environment supporting the continuance of some projects, as well as providing examples that other schools might wish to follow. Many of the activities were either authentic tasks, which related to real life situations, or multi-layered, cross-curricular activities involving higher order thinking. These types of activities were considered as providing stimulating learning environments (Adey and Shayer, 1994; Williams, 1999). So European Schoolnet provided a place for teachers who might be categorised innovators and early adopters. They encouraged a variety of ways of using the Internet to enhance provision for their pupils and to provide professional development opportunities for themselves. However, most teachers were not yet involved in these exciting new developments. Watson (2000) outlines the situation where 86% of European teachers were not up to date in their educational practice. Research evidence suggested that few teachers were fully familiar with the European Schoolnet Web site or the potentially valuable professional resource for sharing and dissemination of new pedagogic practice across much of Europe.

The majority of research looks at the use of ICT in schools and the issues associated with it. In education, schools will only be able to meet the needs of all learners if they work in partnership with one another, sharing resources and assembling the right mix and range of education for each individual learner (Leadbeater, 2004). Networked services are structured around individuals and active groups, but networks of schools will also be significant in the creation of new practices that are particular to a specific context or group of schools (Hannon, 2004) leading to improvements in learning and pupil achievement. .

The ImpaCT2 report (Harrison, 2002) evaluated the use of ICT in Schools programme in the UK which sought to improve standards and encourage new ways of teaching and learning. The research showed that ICT was generally popular. That finding was perhaps to be expected. What was not anticipated was that for the most part pupils were familiar with handling computers and were not intimidated by the demands of the applications used. They suggested that ICT can exert a positive influence on learning, though the amount may vary from subject to subject as well as the age of the learners. This research suggests that networks enable the needs of individual learners in schools to be met. They also enable us to formalise collaborative arrangements and to investigate new forms of leadership. They provide the mechanism for us to learn from our peers and the space to develop effective and innovative practice (Fullan, 2004). Networks increase access to good ideas and they allow groups of professionals to take collective responsibility for children.

Networked technologies alter relationships and redefine the roles the learners and teachers take, whilst technologies such as intranets can potentially be used as mechanisms through which to scaffold independent learning and increase the pool of resources available (McFarlane *et al* 2000). Increased parental involvement may further maximise the resources available and the variables favourably impacting on outcomes. Therefore, the potential beneficial impacts of ICT supported home-school links would appear significant in terms of both teaching and learning and management of the curriculum and school. However, this may be dependent upon a number of contextual and environmental factors being in place.

There are indications that networks can provide more opportunities for school-home-community involvement in the learning process. Networks ought to be, by their very nature, more open, more fluid and therefore more accessible. Many of the current networked learning communities link people who are similar in crucial respects – they link schools, classrooms and teachers around a common core purpose of improving learning and teaching.

Research has suggested that the majority of parents would also be receptive. Swick (1992) noted that parents are 'deeply interested' in becoming more actively involved in their children's education when there is a system that not only invites but actually pursues participation. E-Envoy (2000) suggest that, whilst benefits in terms of attainment gains are difficult to assess, aspects such as increased parental participation, greater self-esteem and motivation

can be more readily identified. Whilst some evidence suggests a correlation between levels of school ICT resources and attainment (Becta 2001b), there is more conclusive evidence to suggest that ICT can lead to improvements in affective aspects such as motivation, self-esteem, attitudes and confidence (*cf* Mumtaz 2000). Such aspects may be pre-requisites for improvement in other areas of education. Moreover, parental involvement has also been identified as having a positive impact on attainment and, as noted above, the capacities and functionality of ICT offer an important added dimension to home–school links in facilitating greater communication and involvement between the home and school. In some cases there is further opportunity for children to practise in certain skill or subject domains, and for parents to increase their knowledge of their children’s school, learning objectives and curriculum subjects. Forgatch and Ramsey (1994) also state that there is clear evidence to show that parents need regular and accurate information regarding their children’s performance at school. Networked systems offer a mechanism for the efficient delivery of such information.

Pelgrum (2001) suggest that teachers and their school managers need to consider whether or not they are optimizing the use of the available resources. The policy for schools to move towards dedicated computer suites is an important issue which may contribute to this. So it is the organisation of resources, rather than the lack of them, which is inhibiting the use of ICT by teachers. Many respondents to the Besa (2000) survey explained that the school hardware is kept and used in ICT suites, and that this causes problems when so many members of staff have a wish to use those rooms at the same time. Fabry and Higgs (1997) noted that numbers of computers alone do not necessarily ensure adequate access, and that it is important to locate the proper amount and right types of technology where teachers and students can effectively use them. Ofsted (2002) acknowledge that computer suites are an important factor in improving pupils’ ICT capability, but at the same time suggest that for secondary schools it is important to organise ICT resources according to the needs of individual departments, using computer suites, clusters of machines and individual workstations as necessary.

As the DfES (2004) has acknowledged, from the recent experience of schools involved in learning networks in the UK, it is clear that schools working together can add significantly to teachers’ professional development and children’s learning in order to raise standards. Schools involved in networks have seen that networks:

- broaden the teacher expertise and learning opportunities available to pupils
- provide a direct mechanism for sharing expert teacher practice
- provide the diversity, flexibility and range of opportunities that no single school can offer
- nurture creativity, risk-taking and innovation to improve learning and teaching
- lead to improvement in pupils’ attainment lead to improved teaching

There is a great deal of literature to suggest that effective training is crucial if teachers are to implement ICT effectively in their teaching. Efforts have been made to address the need for ICT training. In the UK, Kirkwood *et al.* (2000) made several observations regarding possible reasons why the uptake of training was slow, acknowledging the fact that teachers who were “technophobic” would have been discouraged from seriously engaging into a training programme which involved addressing an “extensive” set of competencies. The authors suggest that some of these competencies were not of central importance, making it harder for such teachers to discern which areas they should concentrate on. It was also noted in the same report that the roll-out of equipment that should have closely followed the training had been too slow, resulting in limited access for teachers to make use of their newly acquired skills, and this view is supported by Manternach-Wigans *et al.* (1999) who found that teachers are frustrated by receiving training in certain technology applications, only to find they do not have access to that application once the training is complete.

The pedagogical training of teachers in how to use effectively use ICT to manage pupil learning is very important. Wild (1996) identifies the need for individuals to blend the computer into their professional life, and to make the computer respond to the needs of the user, rather than the other way around. Equipping teachers with IT skills will not necessarily influence the likelihood that they will use computers to improve the quality of their teaching. In a study of teacher education institutions in Scotland, Simpson *et al.* (1999) also found the lack of pedagogy in ICT training to be a gap. Snoeyink and Ertmer (2001) suggest that the first stage of training should focus on the basic operations of technology and software applications, and once teachers have acquired the basic skills, only then should they move on to pedagogical training. Preston *et al.* (2000) commented that teachers felt that they had not had adequate training, particularly in their ability to solve technical problems and in understanding the basic workings of the technology, but the newer operating systems removed this need (Manternach-Wigans *et al.*, 1999). So, the lack of teacher competence, together with the associated lack of quality training for teachers remains a barrier to teachers effective use of ICT.

Becta (2001) discuss the ways in which and associated network technologies might already be impacting on the relationship between home and school – for example, through unmediated access to educational resources. They comment on the home school links which encourages changes to parental cultures, as well as particular skills and competencies (Moll *et al* 1992).

Networking itself between institutions is important in facilitating the spread of innovation in practice. At the moment, innovation tends to be isolated and, though there are some networks and mechanisms in place for sharing practice, it is unlikely, owing to limited embedding of ICT, that online networks and services currently have a real impact on other institutions. Overall, the evidence suggests we have an ICT system which is not yet capable of facilitating a fully networked learning community which adds value for learners.

Research into the potential for wide area computer networks to drive the process of educational reform is urgently needed. The technology is now both affordable and practical to implement in the school environment. Carlitz and Zinga (1997) state that, by using the technology effectively, schools will be able to develop new learning environments and provide students with educational opportunities adequate for the demands of an evolving society. It is clear however that most institutions are only at an early stage in developing the use of networked technologies to facilitate learning beyond the institution. The process of learning itself can be enriched and improved via networks which make new forms of collaboration and sharing between learners possible. This means that, as opposed to being peripheral or a 'bolt-on', ICT is now central and critical to educational processes and to learning and teaching.

There is a growing body of evidence relating to the positive impact of ICT on learner attainment and other outcomes, but we need to develop further our understanding of effective ICT pedagogies and how they can be supported. Factors which account for whether there is positive impact on learning include subject tradition with ICT, use across the curriculum, and quality of leadership and teaching.

If Schoolnets are to be established across national ICT systems so that they can be used across educational processes, then central intervention is needed to facilitate the development of an appropriate national ICT 'architecture' which supports both the provision of relevant learning opportunities and data management across the system.

If this is the case, then some key issues which need to be researched are:

- The impact of ubiquitous access to ICT
- The channels that can be used to encourage the sustained and integrated use of networked ICT
- The ways ICT can be efficiently developed to fully support a range of educational processes, so that the uses of ICT within institutions become joined up and seamless
- Implementing teacher expertise, unlocking the potential of ICT, especially where associated with initial teacher training and in-service professional development

Schoolnets in Schools

Embedding effective innovation across the education system is a key challenge, how we can develop strategies for delivering change in institutions in different circumstances is the key to implementing Schoolnets.

Network-based education provides an organisation tool that provides a method for evaluating the progress of students. They equip teachers with the tools needed to build effective learning approaches for pupils and opportunities to share things with their colleagues.

Teachers (and learners) therefore can access high quality resources, learning materials and online activities. They also connect others in the learning process, such as librarians, parents, administrators and others. Such developments are sometimes referred to as Educational Learning Communities.

Most Learning Communities are used for collaborative projects. Schoolnet platforms are normally developed to offer an environment for collaboration. They enable pupils to use ICT as a means for co-operation, independent learning, constructing their own learning and exchanging information and ideas, so that their own learning process is backed and reinforced.

The elearning Europa Web site identifies the following competencies that focus on the learning process:

- Pupils can co-operate in a functional way in order to perform a straightforward search assignment by means of ICT.
- Pupils can represent information multimedially with the aid of ICT.
- Pupils can learn independently in a ICT supported learning environment.
- Pupils can collect, process and save information by means of ICT.
- Pupils can send their own messages and receive messages for their attention with the aid of electronic communication resources.
- Pupils can practise independently with the support of ICT.
- Pupils can engage independently in an assignment by using ICT.

http://www.elearningeuropa.info/index.php?page=doc&doc_id=5092&doclng=6&menuzone=0&focus=1&mtopic=7

The potential benefit for schools is that ICT becomes a key, integral element of the school reform agenda, therefore freeing up time and energy to help remodel the school approach; enabling efficient knowledge management within schools; supporting knowledge transfer between schools and outreach to parents and the community; as well as being a hugely powerful medium for transforming teaching and learning.

<http://www.eep-edu.org/InnService/InnHome.htm>

The work of Schoolnets relates closely to virtual symbols of education and the concepts of Virtual Schools and Virtual Classrooms. It also relates to concepts of elearning and the use of digital media to enhance learning opportunities. The Virtual School is made for European teachers by European teachers, and is a virtual meeting place for teachers to discuss and exchange material and experience.

A virtual classroom is normally considered to be an electronic classroom consisting of off-site students (who could be in several locations), where instruction involves the synchronous or asynchronous use of electronic learning tools such as videoconferencing, online classrooms, whiteboards, chat rooms, document cameras, and so forth.

The concept of a virtual school is still forming, and as the related technology and available tools is constantly changing, trying to define a virtual school is like attempting to hit a moving target. Approaches to virtual schools can be divided into three broad and inter-connected categories, independent, collaborative and broadcast (TeacherNet, 2004).

- a) Independent Learning is unscheduled. Students can access and interact with materials whenever they wish. There are no chat or videoconferencing facilities, but e-mail may be used. This approach is also referred to as asynchronous, because it does not rely on real-time, direct communication between students and teachers.
- b) Synchronous approaches have a series of scheduled on-line meetings with others in the system. This can include live chats and videoconferencing. It requires collaboration, and communication at agreed times. With this method, there are greater opportunities for socialisation, but there is reduced flexibility because 24-hour access is not expected.
- c) Broadcast virtual learning occurs when students access materials or broadcasts, usually on the World Wide Web. The opportunity for interaction is often restricted.

The European Schoolnet Virtual School encourages collaboration between schools in Europe (European Schoolnet, 2004). They support the use of information and communications technology (ICT) in schools, to make cooperation between schools in Europe easier. Pan-European content and contacts are provided to help teachers get involved in international education activities and projects. The Virtual School did not aim to compete with national websites or resource centres, but instead aims to complement them at European level. More generally, the Virtual School is a giant learning resource, featuring online events, activities, selected online materials. There are 20 subject-related departments with teachers, heads, teacher-trainers and researchers from countries all over Europe.

Financial aspects of Schoolnets

Schoolnets are supported financially in many different ways. In some cases they are central or regional Government initiatives, in others they are developed by schools and in some cases they are either sponsored by or developed by industry and business concerns. In some cases a mixed partnership has evolved, for example Global SchoolNet (www.globalschoolnet.org) was supported by the DfES (Department for Education Skills) and the National Science Foundation; Cisco Foundation; Advanced Network & Services; Microsoft; MCI/Worldcom. SchoolNet Global evolved from TescoNet 2000, which was established in 1997 and was sponsored and supported by the retail chain Tesco.

European Schoolnet (<http://www.europeanschoolnet.org>) has a number of significant corporate partners, including Sun Microsystems, Intel ®, Innovation in Education and was initially funded by national ministries of education and the European Commission and promoted by the Swedish Ministry of Education. .

Organisational aspects of Schoolnets

Transforming the use schools make of ICT can only take place when there is effective support that integrates ICT into national and local strategies and programmes and involves all major educational agencies and bodies. This means that the roles of local, regional and national education organisations need to be clarified together with the support that they should be providing to schools they are responsible to.

Schoolnets thus will need to collaborate with the ICT industry and other professionals to ensure that the digital learning resources available to schools take full advantage of the teaching and learning possibilities offered by ICT.

Co-operation between the Ministry and these agencies including teacher training, inspection, quality assurance and curriculum development will be important and specialists who understand and recognise the potential of learning environments and elearning will be central to the system. At the same time research and evaluation needs to be undertaken to inform policy and practice at all levels. In some cases Schoolnets have been organised by subject specialists or professional associations, such as the Teaching English as a foreign Language group. In other instances, Non-Government Organisations (NGOs) play a central role. This was the case in SchoolNet Africa which operates across the continent in African schools. Thus SchoolNet Africa works mainly with learners, teachers, policymakers and practitioners through country-based Schoolnet organisations across Africa.

The European Schoolnet Concept

European Schoolnet is a unique initiative, which aims to ensure the interoperability of school networks developed in each member state and provide 'a model platform' offering teachers and pupils access to high quality information and services of European interest. It is a Brussels-based organisation that supports and promotes projects in and between schools across Europe. For teachers, there is a database of resources from all over the EU covering many subjects including Civics and Special Needs. MyEurope is a resource to stimulate and assist schools' work on European issues. Virtual School is a forum for teachers to exchange materials and experiences with a view to bringing more European awareness to their schools. Tutorials and guidelines on using ICT at school are part of the teacher training area.

There are also tools and advice on creating and maintaining websites too. The pupils' section contains competitions and web resources.

On September 8, 1998 the European Schoolnet was officially launched during a conference in the IBM International Education Centre, Brussels. This project started on 17 December 1996, when the Swedish Minister for Schools and Adult Education, proposed that Member States should take a joint initiative to establish a European school information network to promote contacts and cooperation among schools in Europe.

The overall objective of European Schoolnet is to promote the use of ICT in education at European schools, especially by: encouraging and supporting cooperation between schools in Europe; offering didactic-pedagogic material and services; supporting the professional development of teachers; exchanging experiences and examples of good practice and other activities (European Schoolnet, 2005). European Schoolnet thus became the framework for the co-operation between more than 26 European Ministries of Education on Information and Communication Technology in Education and the European network of national, regional and local educational networks. The development sought to develop learning for schools, teachers and pupils across Europe and to provide insight into the educational use of ICT in Europe for policy-makers and education professionals.

European Schoolnet is thus a core Schoolnet as it links together national school networks and portals, providing access to information, resources and partner schools. This European school information network is an indispensable tool for pupils, teachers and school leaders in Europe and provides a framework for collaboration between schools in Europe.

ICT and schools in Europe

Information and communication technology (ICT) is increasingly playing a significant role in classrooms across Europe. What is less clear is the impact that ICT can have through different learning approaches. Tools that empower learners are starting to change the way that learning activities are carried out in Europe. It is likely that the development of e-twinning of schools in Europe and the promotion of teacher training actions in this area will support and further develop networking in schools, to make it possible for all schools in Europe to build pedagogical partnerships with schools elsewhere. Innovative cooperation methods can and should be promoted.

An e-twinning support network has been created with European Schoolnet taking the lead. With their undoubted experience in European cooperation this will be highly successful and encourage an ever-increasing number of schools to become involved in collaboration and effective use of e-networks. European Schoolnet provide the pedagogical support and guidance; tools and services for partner searching; methods for exchange of experience as well as an Internet hub, based on existing websites, for the twinning action.

There needs to be significant support for cooperation networks in the field of in-service training of teachers and of other educational personnel. These networks must be based on higher education institutions responsible for the initial and in-service training of teachers and therefore the pedagogical use of information and communication technologies. Researchers in this area also need to be encouraged to network together. These networks must focus on the integrated use of Schoolnets in the education and training systems together with the creation of training and support materials. Head teachers and managers are also a key group, they need to aware and informed and thus the establishment of national and European networks to encourage this are paramount to promotion and implementation in the school setting.

Making a case for Networks

The justification for Schoolnets is based on the premise that connectivity enhances learning by making the transfer and sharing of knowledge among the population of Europe more effective. This is intended to lead to economic, social and cultural benefits towards a competitive economy and a just society. The following examples of existing Schoolnets are able to further this case.

There are already a large number of existing electronic Schoolnet networks, such as Becta's ICT Research Network that are devoted to professional development that link teachers to others outside their own locality. Preston *et al.* (2000) notes that these networks are something that benefit experienced teachers by providing:

- dissemination of good practice
- personal development, such as increased confidence in using ICT and public speaking
- communication and collaboration with other teachers
- increased motivation to use ICT effectively
- better access to resources and research
- improved ability to write educational materials for the Web
- greater understanding of the culture of the Web
- a sense of community and collegiality.

Global SchoolNet's mission was to identify, support, and encourage effective practices and programs that engage students in meaningful content and personal exchanges with people around the world to develop basic and advanced literacy and communication skills, create multi-cultural understanding, and prepare them for full participation as productive and effective citizens in an increasing global economy.

Similar developments to the above have been created in the Netherlands, where the government has provided financial support for up to 200 teacher networks which include an electronic dimension. An earlier Dutch programme of this sort is reported to have provided a very effective alternative to more traditional in-service training, with the programme reaching 50% of the target schools (Brunemann *et al.*, 2000).

Schoolnets in European Schools

Examples of Schoolnets for schools

SchoolNet SA (<http://www.school.za/>)

SchoolNet SA was established in November 1997 as a non-profit educational organisation. The vision was to create learning communities of educators and learners who use information and communication technologies (ICTs) to enhance education in South Africa. The organisation arose from the work of provincial schools networks, non-profit collaborative entities formed by networks of schools to assist each other in gaining access to and using the Internet and computers.

SchoolNet SA was formed with the assistance of the Centre for Educational Technology and Distance Education (national Department of Education). It has operated as an NGO with core funding from the international donor sector, and expanded its work substantially through project funding from the South African corporate sector. It manages a variety of projects covering all aspects of the use of ICT, directed mainly at historically disadvantaged schools in South Africa. Through partnerships with the public sector, donors, corporate South Africa and civil society have also been established, SchoolNet SA is contributing to the transformation of the education system in South Africa.

Schoolnet Global (<http://www.schoolnetglobal.com>)

Half a million children around the world have described their lives, families and communities as part of this Schoolnet. This was the world's biggest children's contributory website, promoting intercultural understanding and language learning. The SchoolNet Global project started in 1998 in the UK. There were participants in over 20 countries. Children contributed pages in English and in their own mother tongue.

Schoolsnet <http://www.schoolsnet.com/>

Schoolsnet was launched as a separate site in November 1999 to offer parents, pupils and teachers information on both primary and secondary schools throughout Great Britain, as well as providing valuable information on lessons and job opportunities within the education sector. In 2004 Schoolsnet became part of the Hotcourses website, contributing to what is now one of the UK's leading online educational networks.

Canada Schoolnet <http://www.schoolnet.ca/>

This large collection of educational resources aims to help Canadians reap the benefits of new technology and the internet. It is available in French and English. The main user groups are learners, parents, carers, teachers and lecturers. It targets groups over 16 years of age and provides learning materials, information and educational services. Access is free.

European Schoolnet <http://www.eun.org/>

This portal for national and regional networks for schools in Europe is available in a range of European languages. A number of annual events provides an opportunity for schools, teachers and pupils from all over Europe and across the globe to learn, collaborate and innovate together. The user groups are administrators, managers, support staff, teachers and of course pupils. The Schoolnet site contains something for everyone at for education of all age groups. The resources are in many forms and include advice, guidance, learning materials, partner search and innovative products. They are backed up by an international pedagogical team of experts.

Digital Palette (<http://www.digitalpalette.org.uk/>)

Digital Palette won an eLearning Award in 2003 and is a web site for art teachers. It represents all phases of education and is intended to be a resource for teachers who want to use ICT in Art Education. The case studies provide exemplars of good practice. They demonstrate different approaches and use a number of techniques and processes, as well as a range of different software. The web site is supported by a CD Rom which is to be updated as new case studies are submitted. The web site includes regular updates based on the UK National Curriculum in the form of WorCboxes and Masterclasses.

Appendices

Some definitions:

e-learning

Learning that is accomplished over the Internet, a computer network, via CD-ROM, interactive TV, or satellite broadcast.

eTwinning

eTwinning is about enhancing pedagogy and schools see it as a worthwhile activity that adds value to conventional learning.

Interconnection

the connection of two networks thereby allowing customers on one network to connect with customers on the other network, or to access services provided by the other network.

networking

The process of connecting computers together on a network so that they can communicate among themselves and share resources, such as papers in a writing class.

virtual classroom

An electronic classroom consisting of off-site students (who could be in several locations), where instruction involves the synchronous or asynchronous use of electronic learning tools such as videoconferencing, online classrooms, whiteboards, chat rooms, document cameras, and so forth.

virtual community

a community on the Internet where people share common interests; an online community.

virtual course delivery

A method of course delivery via Web-based instruction, online sources, CD-ROMs, videos, and/or videoconferencing. The delivery of the course content takes place from a distance, and the teacher is separated from the students by space or time, or both.

virtual field trip

A simulated, real-time field trip. In the case of videoconferencing, students interact in a live event with a remotely located field trip host.

virtual learning

Employing information and communication technologies to deliver instruction. Virtual learning is a term frequently used interchangeably with distance learning, online learning, e-learning, or Web-based learning.

virtual learning environments

A learning environment where teacher and student are separated by time or space, or both, and the teacher provides course content through course management applications, multimedia resources, the Internet, videoconferencing, and so forth. Students receive the content and communicate with the teachers through the same technologies.

virtual student

A learner who, through electronic means, accesses courseware and instruction, learns concepts and content, asks questions of a remote teacher, and sends the remote teacher work for assessment purposes.

virtual teacher

An instructor who, through electronic means, provides courseware and instruction, responds to students' questions, and provides feedback and course assessment.

Web-based learning

Often referred to as online education, this is a course of study delivered via the Internet (or more specifically, the World Wide Web). Students have electronic access to the teacher and other students through e-mail, electronic bulletin boards, online chat rooms, e-mail lists, and so forth. A specific Web site is set up that allows students access to course materials and assignments in an "anytime/ anyplace" learning environment. In most cases, this is exclusively an asynchronous exchange between teacher and student.