

TOWARDS A BARRIER FREE INFORMATION SOCIETY.

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Introduction

The title of this paper has been carefully worded for a number of reasons. Firstly, it is quite “catchy” and it is hoped it will provoke people’s interest. Secondly, it draws attention to two important European Commission documents that have bearing upon the contents of this paper: the Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions *Towards a barrier-free Europe for people with disabilities* (COMM (2000) 284 final) and the Community Action Plan prepared by the Council and the European Commission for the Feira European Council meeting *eEurope 2002 - An Information Society For All* (European Commission, June 2000).

Finally, the title has been written in this way to emphasise the reality of the situation we are all working in at present - we are only moving *towards* an information society that for some people is still far from *barrier free*.

In the rationale for this conference, there is a phrase that has resonance for my particular field: *disillusion with regard to the role of technologies as a panacea for great problems facing education...* With respects to the area of special needs education, despite the developments and innovations that have occurred in technology hardware and software, support, training and application of specialist knowledge, there is still – perhaps even in some quarters increasing – disillusionment with the role ICT is playing in some pupils’ education. If the information society for all is to become a reality for all European citizens, then there are still obstacles to be overcome and important considerations to be taken into account. One of these crucial debates centres upon ensuring the information society is barrier free for pupils with special educational needs.

This paper aims to identify some of the current barriers in the field of information technology across Europe that are faced by pupils with special educational needs and

consider some of the steps that are being and still can be taken to work towards the aim of an information society for all that includes them. This paper links particularly well, I feel, to two of the main conference themes: the process of planning and use of ICT in learning and teaching processes (or rather the fundamental precursors to allow this to happen effectively) and the training of (or support for) the various agents within the educational system.

I will attempt to examine issues connected to these themes in relation to the use of information and communication technology (ICT) in special needs education (SNE) settings in different European countries.

The basis for the paper is information from two European Agency initiated projects; the information and communication technology (ICT) in special needs education (SNE) project that provides present state of the art information on ICT in SNE in different 17 European countries and also the SEN-IST-NET project, which is presented here as an example of a practical strategy being taken to try and address some of the issues evident within this area.

The European context for the ICT in SNE

About 10% of the population of Europe has some form of recognised disability (European Commission, 1999) and it is estimated that there are 84 million pupils and students – approximately 22% or 1 in 5 of the total school aged population - who will require special educational provision either in a mainstream classroom, as part of a special class or within a separate institution (Eurydice, 2000). Depending on the way a child is identified and assessed in the countries of Europe, pupils with *special educational needs* (SEN) make up between 2% and 18% of the school age population (European Agency/Meijer, 1998). The statement of the Salamanca World Conference (1994) suggests that in the past special education was defined in terms of a range of physical, sensory, intellectual or emotional difficulties pupils may present. However, it is now necessary to widen the concept of Special Needs Education (SNE) to include all pupils who, for whatever reason, are failing to benefit from school

Today, the provision of education for pupils with special needs varies across Europe according to different educational policies. The European Agency report (edited by

Meijer, 1998) distinguishes between a one-track approach (full inclusion of all pupils in the mainstream system), to a two-track approach (mainstream and segregated) and finally a multi-track approach (with intermediary provisions between mainstream and segregated systems). Despite differences in political standpoints and practical provision, all European Union countries are in agreement that meeting the educational needs of every individual pupil and student can be viewed as an important element of guaranteeing the quality of life of European citizens. In all countries, information and communication technology (ICT) is increasingly seen as a major tool in meeting this challenge.

The European Union *eEurope Action Plan* (2000) underlines the fact that education is the foundation of the Information Society, since it has an impact on the life of every citizen. The EC Communication *Towards a European Research Area* (2000) argues that there is a real need to improve co-ordination between research, industry and educational establishments, encouraging trans-European research and sharing of knowledge between the research, business and education worlds if the full potential of the information society is to be made available to all.

The OECD study *Learning to Change: ICT in Schools* (2001) clearly shows how ICT is potentially set to transform pupils' school experiences in all countries. The study outlines how large financial (up to \$16 billion annually across the OECD countries) and time investments are being made by countries to fully equip schools in terms of hardware, software and internet connectivity. Information from Eurydice (*Key Data 2000*) highlights how almost all EU, EEA and pre-accession countries have National or official policy documents which promote the use of ICT in educational sectors. In addition, most countries are currently implementing National or Regional level projects and initiatives to introduce and support the introduction of ICT into educational organisations.

However, the present indications are that an "information society for all" – as, for example, described by Stephanidis, Salvendy et al (1998) as the application of the concepts of universal access to all information technology hardware and software for all possible users groups - is far from a reality for all European school pupils. The OECD study emphasises that installing the hardware and using ICT to do traditional

things in different ways will not in itself lead to pupils and teachers taking full advantage of the knowledge/information society. The study also argues that schools have to learn to change to new ways of learning if the potential of ICT is to be realised for each individual pupil.

Similarly, the information from Eurydice highlights the fact that the provision of hardware and software in educational organisations is not always accompanied by the sorts of support structures necessary to maximise ICT use; the Eurydice information stresses that even though ICT is included in the curricula of most countries, it is often taught as a separate subject. Most importantly, in-service training in ICT is often available, but not compulsory and specialist support staff in schools are mainly only available at secondary sectors levels. The European Experts' Network on Educational Technology publication *How Learning is Changing* (1998) stresses that basic teacher training to achieve ICT competence needs to lead to further training developing pedagogical skills and understanding of the possible uses of ICT in classrooms if its potential is to be maximised.

The Eurydice survey *ICT@Europe.edu: Information and Communication Technology in European Education Systems* (2001) argues that ICT in itself will not result in massive changes in the education systems of European countries unless its potential as a tool for learning is more fully explored. This survey points at that many countries are still at the stage of introducing technology into sectors of the education systems and the real influence that technology could have on educational practice has yet to be seen.

Information from the European SchoolNet (1999) shows the disparity in hardware access across countries (ranging from 7 to 150 pupils per machine in primary and 5 to 37 in secondary schools) and Internet access (between 5% and 90% of primary schools and 48% and 100% of secondary schools connected to the internet). Whilst the figures here are likely to have changed dramatically in the intervening period, it is obvious that there remains great disparity in the access individual pupils across Europe have to various types of information technology.

The Eurydice (2001) survey discusses the possible effects of this disparity of access – the survey considers an impending “digital divide” unless countries take action to ensure certain groups are not disadvantaged in their access to and competence in using ICT in educational contexts.

Whilst there are very important National level sources, European wide information on ICT usage with pupils who have a range of special educational needs is very limited. None of the European studies referred to above specifically considers the use of ICT with pupils with special educational needs. Similarly, whilst there is a widespread international research forum - universal design in human computer interaction - focussing upon improving accessibility to ICT for people with all types of disabilities, it very rarely includes debates regarding the needs of pupils with special educational needs or the teachers and professionals who work with them (European Agency/Watkins, 2001). Information on ICT within SNE concerning policies and practice, or the impact of key issues emanating from the application of ICT within an educational context (as discussed above) is not easily available at a European level from either educational or ICT research observers.

It is within this arena of increased ICT application in education across Europe, but the limited availability of information regarding ICT use within SNE that the Agency has developed its ICT project work.

The ICT in SNE Project

The European Agency is an independent organisation that is supported by the Ministries of Education from the 18 participating countries (15 EU member states, Norway, Iceland and Switzerland) as well as the European Commission. The three Baltic countries (Estonia, Latvia and Lithuania) participate as observers. The function of the Agency is to collect and process European information about Special Needs Education from all of the countries, process and then disseminate it in as many flexible and accessible ways as possible. This is accomplished through reports and publications (both print and electronic), the newsletter (EuroNews) and - most importantly - via the Agency website (www.european-agency.org).

Information technology is one of the main tools both for communication and dissemination used by the Agency. This fact was partly instrumental in the use of ICT in SNE being identified as the focus of Europe wide research during 1999 – 2001, the aim been to establish a resource bank of information relating to ICT in SNE, the specific objectives of the project being to:

- provide an overview of existing country-based information in relation to ICT in SNE
- highlight the key issues regarding ICT in SNE in the countries
- identify examples of interesting ICT in SNE practice that may act as a useful reference for teachers and support professionals in other countries.

Information was submitted by 17 Agency member states: Austria, Belgium Flemish and French communities, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden and the UK. The information collected provided an overview for each of the participating countries, highlighting the strengths and weaknesses of the policy and infrastructure of equipment (hardware and software), specialist support, access to information and ICT training available to teachers in special education settings.

The project highlighted a number of crucial issues in countries that need to be considered both at National and European levels within the debate of promoting and delivering an information society for all.

Without exception, all countries highlighted a range of factors that currently influence the application of ICT in the SNE context. Each country differed in the types and emphasis placed upon the issues identified as being faced in their country, but from the information presented, it is possible to identify a number of common areas where issues are evident. These areas will now be considered separately, but it is important to stress the interconnection and inter-dependence between each of the areas.

(Under each of the points, countries raising these issues as significant for their situation are identified in brackets).

National or regional policy level

Most countries indicated that there was no specific ICT in SNE policy in their country and that general ICT in education policy included special educational provision. Some countries indicated that the general ICT policy included statements of equity of educational opportunity with respect to and through the use of ICT (Denmark, Finland, Iceland, Norway, Sweden). For some countries (France) national educational policy states that pupils with SENs have same rights as all other pupils – this includes access to appropriate ICT.

A number of countries (Iceland, Ireland, Portugal, Spain, UK) identified that there was a national level ICT strategy or programme – or defined as specific project (Greece) or funding arrangement (Netherlands) - specifically focussed upon ICT in SNE. Only Portugal identified a specific policy, where ICT is incorporated as a particular element of national disability and SEN legislation. In some countries (Austria, France, Iceland, UK) as an element of educational policy, ICT is embodied within the school curriculum that applies to all pupils, including those with SENs.

All countries indicated that different bodies are responsible for policy implementation – national and regional level, school level (specialist ICT and/or SEN teacher coordinators) and support service and centre level (inspectorate, specialist teachers etc) - with overall responsibility being at ministerial, sometimes regional government level and then action (as termed by Denmark and Netherlands) or implementation responsibility being taken by a range of partners – even including private companies (i.e. network providers in Belgium [French community] and commercial providers in the UK).

The central issue facing some countries (Ireland, Portugal) in relation to SEN and the use of ICT is the lack of coherent support structures - available to teachers, parents, support staff and pupils - underpinned by clear ICT in SNE policy. Such support structures require personnel with appropriate expertise (Belgium [Flanders], Ireland) as well as the appropriate resources at school and individual pupil level (France) and also at regional or support centre level (Portugal, UK). These elements can only be realised if there is a policy directing their implementation.

Policies need to redress the possible disparities in resources and support across an area (France, Ireland, UK) as well as at individual school and pupil level (France) and it is therefore important for them to be based upon a clear understanding of the ICT situation in the given area (Netherlands). For example, it would be useful for a policy to establish: an overview of hardware and software available for different SEN target groups; clear information about teachers' needs for products; what specific training in using ICT is required; information on models of ICT management in schools; general knowledge about integrating ICT in education (Netherlands).

In relation to the provision of training for teachers and support staff, any policy would need to operate on two levels, the first being training the next generation of teachers whilst also implementing a programme of training the current generation of teachers and support personnel (Belgium [Flanders]).

Primarily, the ICT in SNE policy would need to work developmentally towards establishing a satisfactory infrastructure of ICT in the area.

Infrastructure – hardware, software and internet access

The issue of access to appropriate IT resources at the school level – hardware, software, internet access and funding for running costs – was raised by a number of countries (Austria, Belgium [French and Flemish communities], Denmark, Germany, Greece, Iceland, Portugal, Spain, UK).

Providing individual pupils with the necessary material equipment – equipping all classrooms with hard and software and internet access (Austria, Greece), providing specialist equipment for pupils with specific needs (Denmark, Spain), covering on-line costs (UK) – was also stressed.

In the long term, it maybe necessary to develop more flexible models for financing equipment, including its maintenance and care (Germany). Such models would need to take account of different stakeholders in the information society – educational organisations, parents, industry, researchers and social institutions – if serious disadvantages across regions, countries and Europe are to be avoided.

However, as well as access to financing to allow the provision of suitable equipment, the issue of availability of appropriate types of hardware and software needs to be considered. Whilst access to suitably adapted or designed hardware remains an issue, access to software that meets pupils particular needs is an area of concern (Germany, Iceland) as is access to internet material designed for pupils with different types of special needs (Greece). To support the learning of pupils with individual needs, the priority is for software that can be adapted to individual learning requirements. In addition, varied software should be available which fits in with the curriculum and individual study goals (Iceland).

The aim of ICT in the SNE setting could be considered to be meeting the individual needs of pupils with SENs via an appropriate personal technical infrastructure (Germany). The provision of this appropriate technical infrastructure requires a consideration of the key principles of learning and teaching as well as the identification of individual learning styles and approaches

Pedagogy

A key concern to be addressed by ICT in SNE users and specialists in many countries is: how can ICT give more, or added, value to the educational experiences of pupils with special needs? The real educational value of ICT, not its potential use as just another tool in the learning environment, is the current issue. When, how and why it is desirable to use ICT and how its use may be adapted to the requirements of individual subjects and the individual study goals of pupils with special needs is a key question being faced within countries.

Developing good quality, relevant electronic educational resources for pupils with SENs is one task (Finland, France, Greece, Norway). However, attempts to extend the best application of ICT and to generate a new quality of learning will not be successful unless new theories of learning using new technologies are devised (Germany). What needs to be developed are methods on how to use ICT as a pedagogical aid in the teaching of all pupils (Sweden).

Other educational questions are raised: how can information on using ICT effectively in the learning environment be disseminated? (Spain) How can information on good

pedagogical practice be shared? (UK) How can school curricula and study plans more clearly define the purpose of using information technology for pupils SENs? (Iceland) How can ICT methods of use be adapted to meet the requirements of an individual country's educational programme? (Greece).

At a fundamental level, there is the issue of how ICT can be used to support a particular pedagogical philosophy i.e. a school for all (Sweden) and within this context, how ICT is made an integral part of special educational provision, where every school develops its own concepts on the best use of ICT to meet the needs of its pupils (Germany).

ICT presents a range of possibilities within a school, for pupils, teachers and the school as a whole organisation, but there is a need for everyone to be made aware of these possibilities and how to exploit them (France). Added value is not in evidence just because pupils use new technology in the daily educational activities (Belgium [French community]). The positive results of using ICT can be seen if its application leads to:

- teachers being significantly helped in their education practice
- pupils learning more and in better ways for them
- improved communication because of and about ICT across a whole school.

Teacher level

A satisfactory infrastructure and the availability of good quality ICT educational materials is not a guarantee of effective ICT usage in schools. The issue that was raised by every country participating in the project was that of ensuring adequate forms of teacher training for ICT in SNE.

There are various problems associated with teachers' lack of knowledge and expertise in ICT (Netherlands). Often, there is a lack of confidence on teachers' parts in relation to using ICT in their classrooms (Denmark, Norway, UK). They may lack basic skills (Austria, Greece, Spain, UK) or have limited opportunities to practice these skills (Norway).

Training teachers in the effective use of ICT needs to be considered during initial training as well as being a form of on-going in-service training (Belgium [Flanders], Denmark, Germany, France, Iceland). In all training scenarios, training should aim towards helping teachers integrate ICT into their daily practice generally (France) and the individual education plans of pupils (Denmark). ICT training generally needs to be made more flexible and take account of the individual needs of the teacher (Iceland). In addition, any training in the use of ICT needs to examine methodologies, didactics and the organization of learning with clear connections made between theory and practice (Germany).

ICT in SNE should also be the focus of specialist training – either for SEN support teachers or ICT support teachers (Greece, Iceland). The issue of the lack of training in special education generally means it is unreasonable to expect teachers to use ICT effectively in special education if they have not been trained in special education initially (Ireland).

If ICT in the field of SNE is to reach its potential, teachers require access to more expert knowledge and there is a need for more systematic co-operation between different professionals who support teachers working with pupils with SENs in different ways (Iceland). The application of ICT in the process of school development and management will need to be carefully planned and implemented (Germany). ICT in SNE support services must be improved, as must teaching arrangements with teachers and other professionals given time and opportunity for collaboration, allowing for guidance and professional advice as close as possible to the workplace (Iceland).

All of the above points need to consider some of the attitudinal factors in implementing new teaching methods: if the real potential of ICT for pupils' learning is to be reached, teachers will first have to be convinced of the value of using ICT (Belgium [Flanders]). Consideration also needs to be given to the possible issue of addressing and overcoming the factors regarding teachers' ability to adopt and accept changes (Denmark).

The introduction and more widespread application of ICT in educational situations means all teachers – including, perhaps especially, those working with pupils with special educational needs – will be part of developments in the learning environment that will fundamentally change the role of teachers (Belgium [Flanders], Germany). As concepts such as “learning to learn”, “life-long learning” and “on-line distance education” become increasingly accepted, traditional educational methodology will change dramatically for all pupils and those who work with them.

Pupil level

The changing landscape of education – in particular the move towards greater inclusion of pupils with special needs in mainstream education settings - will have an effect upon the educational experience of all pupils. The challenge in relation to ICT in SNE is to ensure that all of the possible advantages these changes can offer are made available to every pupil with special educational needs. ICT in whatever form should be available to any pupil in order to support their individual learning needs (Austria, Greece, Luxembourg)

However, the provision of support is not always appropriate or comparable across regions of a country (Greece, Ireland, UK). Support structures are being developed (Iceland, Ireland), but difficulty is faced in providing the necessary person intensive individualised support needed for pupils with special needs, their teachers and parents (Ireland).

Access to different forms of ICT within education is a reality for many pupils with SENs, but not all, depending upon the type and degree of their disability (Sweden). Equality of opportunity in access to ICT through an appropriate infrastructure, specialist support and ICT competent, experienced teachers is a goal still to be worked towards across Europe.

Accessing relevant information

Access to relevant information can be considered in relation to teachers and pupils. There is a need for pupils to have access to information on the World Wide Web that is appropriate for them (Norway). However, the information presentation barriers

associated with the internet faced by pupils with special needs – both in terms of level, content and languages – cannot be over stressed enough (Austria, France).

The majority of countries highlighted problems associated with access to information for teachers of pupils with SENs. At a national or regional level, an important task for education managers could be to familiarise teachers with important developments and changes in the ICT field (Belgium [Flanders]). Technology develops rapidly and it is vital to have organised data in each country on how ICT can be used to support pupils with special needs (Iceland).

Giving teachers and specialist support staff access to specialised ICT in SNE information is an issue being considered by many countries (Germany, Greece, France, Luxembourg, Portugal, Spain). Possibilities for establishing actual or virtual resource centres (Germany, Portugal) are being considered. Specific responsibility for organising such a central resource bank of specialist information may need to be assigned to one key organisation (France). Any such specialist resource bank could usefully have information on new developments and projects in other countries (Germany, Luxembourg). However, issues of translation of other countries' information need to be overcome first (Greece).

Having access to examples of how ICT is used in other SNE situations is considered useful for teachers and support staff, but the presentation of these examples and the means by which they can give useful detail that can be considered in other contexts requires careful thought (Germany, Netherlands)

Research and Co-operation

The need for systematic research and co-operation between different Agencies in the ICT in SNE field is an area that many countries see as requiring development. Research and co-operation can be considered as being on the one hand separate areas of concern, but on the other, inter-related factors. Both aspects require consideration on the national as well as the international levels.

At the national and international levels, more applied research is required that focuses upon the rationale for using information technology generally (France, Germany,

Norway, Sweden) with more information needed on good examples of research into using ICT in practice (Denmark). More targeted areas of research could consider: the specific question of whether ICT can be used as a means to support inclusive practices (France, Norway); the actual effects of ICT in the learning process (Norway); new technologies specifically designed for pupils with special educational needs (Belgium [Flanders]), Portugal); transnational projects to ascertain the value of international communication in special education (Ireland). Targeted research is also required to evaluate the effects of ICT in SNE policy initiatives (Belgium [Flanders]), France, Denmark).

At an international level, there could be a need for concerted, co-operative research to establish a central forum that could be responsible for developing and testing ICT hardware and software for pupils with SENs (Denmark).

The need for more inter-agency co-operation at the national level was highlighted by a number of countries (Belgium [Flanders], Finland, Iceland, Netherlands, Spain, UK). One specific issue relates to the lack of co-operation in or between schools on teachers training and other ICT implementation initiatives (Belgium [Flanders], Netherlands). More systematic co-operation between different agencies or groups of professionals also needs to be reflected in developments in co-operation between professionals and the parents of pupils with special needs (Iceland) possibly leading to the development of national networks of practitioners in SNE using ICT that would support teachers, support staff and parents etc (Finland).

Increased co-operation at an international level is generally viewed as something that would be extremely positive by a number of countries. Co-operative arrangements would need to take account of and also research initiatives. If the use of ICT in SNE is accepted as a valid Europe-wide goal (Austria), then there are a number of important areas such co-operation could focus attention upon. Building ICT networks (discussion groups, contacts etc) in Europe between teachers of pupils with different types of SENs is one potential area (Netherlands, Norway). Extending the provision of distance learning in ICT for teachers is another (Denmark).

The need for data banks of projects, resources, examples of innovative practice and sources of information related to ICT in SNE to include National and International information is seen as a major area for European wide co-operation (Belgium [Flanders], Denmark, Iceland, Ireland, Norway, Portugal, Spain) and one which seems to require close consideration in the future.

A key tendency emerging from a consideration of all countries' inputs is the degree of agreement that exists between countries regarding what are the priority issues for consideration. Whilst provision of a basic infrastructure in terms of quality hardware and software is stressed, the most important issues relate to developing a clear, evidence based rationale for using ICT in the educational context and equipping teachers with the necessary skills and feelings of competence to implement this rationale.

The development of theory for using ICT in SNE and then developing this theory with the teachers who will implement it, is seen as being potentially enhanced if there are opportunities for co-operation between different groups of ICT in SNE actors at national and international levels.

ICT in SNE – the Future

Throughout the project, the contributors referred to very concrete and specific examples of potential developments in ICT in SNE that needed to be looked at by policy makers, researchers/developers and information providers in more depth. These suggestions give an insight not only into areas of present and future need, but also into what the ICT in SNE field may look like in the future if these practitioners' requests are met.

Specific suggestions related to four areas of ICT in SNE:

- Requirements in terms of IT infrastructure development
- ICT in SNE information provision
- The potential focus of future research and collaboration
- Methods for facilitating the above.

The information in the country overviews presents a wealth of suggestions – so many that it is beyond the scope of this paper to discuss them all in full and readers are referred to the ICT in SNE summary report (Watkins, 2001) for more details. In various ways, many countries suggested that increasing opportunities for international co-operation and sharing of information would be one means of beginning the work in the areas of need identified. It should be pointed out that much of the information referred to already exists at an individual country level, but there is work to be done to co-ordinate this information and make it available, not only internationally, but also to other groups of ICT in SNE users, policy makers and researchers.

The participants in the project all had very clear ideas about what developments would need to be made in these four areas if the needs of pupils with SENs were to be better met through the application of ICT in the future. The points raised provide a very clear overview of what the possible future of ICT in SNE could be, that is a future:

- based upon the application of sound educational theory and principles,
- where international and national information on all aspects of ICT usage is easily accessible,
- in which training possibilities are varied and diverse
- where research, co-operation and collaboration is supported at national and international levels.

The SEN-IST-NET Project

The **Special Educational Needs – Information Society Technologies - Network** project – supported by the European Commission, DG Information Society Technologies – has mainly arisen in an attempt to try and tackle some of the key issues raised by countries within the scope of the ICT in SNE project.

SEN-IST-NET aims to address the problem that certain groups of learners – particularly those with special educational needs - are at risk of not being fully involved in new ways of learning through the application of ICT. The premise supported by the ICT in SNE project findings is that in order to build a truly inclusive Information Society based on participation for all, new pedagogical approaches and

appropriate technologies must be developed and applied to suit the learning requirements of all pupils and young people, including those who have special educational needs.

The project has been developed through a collaborative consortium of project partners: the European Agency; Department of Education, University of Innsbruck, Austria (BIDOK); Institute of Computer Science, Heraklion, Greece (FORTH-ICS); GIUNTI MultiMedia Srl., Milano, Italy (GMM); European Disability Forum, Brussels, Belgium (EDF); Swedish Institute for Special Needs Education, Härnösand, Sweden (SIT); EA National Partners (Ministries of Education); Consiglio Nazionale delle Ricerche - CNR-IFAC, Florence, Italy; Institute of Technology and Work - ITA, Kaiserslautern, Germany; Danish Pedagogical Institute, Jelling, Denmark; University of Kent, Canterbury, United Kingdom. The project is working to develop a Network of Excellence and a common platform for discussion and debate, not only on the development of technologies, but also on the fundamental questions concerning pedagogy and technology-enabled learning. SEN-IST-NET presents a vision and a plan to establish a European Network of Excellence to share knowledge between two communities:

- Information Society Technologies (IST) - researchers and developers working in the field of IST;
- Special Educational Needs (SEN) - researchers, professionals, policy-makers, industrial enterprises and NGO's in the area of SEN.

The intention is that by providing the tools and stimulus material for these two groups of actors who play a role in the development of an information society for all, then a number of the issues relating to technology development, sharing of research interests and sharing of knowledge and expertise in relative fields (i.e. the key issues raised by countries as part of the ICT in SNE project) can be at least opened for wider debate and consideration.

Web Portal

Through on-going development, most networking activities will be conducted through the "virtual" space of the dedicated SEN-IST-NET web portal (www.senist.net). A range of core services are being established, including the development of various

information resource banks. The internet web site will comply with widely accepted accessibility guidelines to ensure that data communication, collaboration, and dissemination activities are made accessible for everyone – including people with disabilities.

Information Networks

The main method of encouraging and supporting networking in SEN-IST-NET is the use of Special Interest Groups (SIGs), each made up of stakeholders from the SEN and IST communities with common interests. SIGs gather members with equal or similar interest around topics of high relevance including: new ideas / approaches, inclusive education, (assistive) technology, policies, and transfer of successful examples. SIGs continuously recruit new members and develop collaborative networking activities, following their independent agendas and work-plans. The on-line discussions and debates will be a constantly developing resource bank of information from and for respective experts in their fields.

Information Resources

The SEN-IST-NET project was designed to be a framework within which people from the SEN and IST communities will be able to meet (virtually and whenever possible face to face) to exchange ideas, experiences and knowledge. SEN-IST-NET is not outcome oriented, but process oriented. The project can be considered to be successful when it facilitates this exchange process and as such, a major support element to facilitating this exchange is the provision of information resources that allow participants to have insights into each other's fields of expertise.

The aim is to make available the essential information that these stakeholders will need to support their communicative exchange process. Both communities will require access to different types of background information from the others' field to provide a context for their communications and potential collaboration with each other.

The intention is that network members will be able to refer to these different types of resources in order get an insight into each others respective fields. The information available is intended to be accessed on a number of different levels – quick reference;

detailed research; consultation of discussion archives; interactive exploration – so that network members can be supported in their participation within the network in a number of ways.

The different types of information resources are provided via

- An ICT & SEN Resource Guide
- Creation and maintenance of a Virtual Library
- Provision of SIG discussion summary documents
- A resource bank of essential background documents
- A Technology showcase

(Each of these resources can be found at the project web portal address www.senist.net Please note, at the time of preparing this paper, some of these resources are still at the developmental stage).

Fostering Collaboration

A central argument of this paper - and the guiding principle of the SEN-IST-NET project - is that there is a real need for special educators to be included in sharing of knowledge and experience with a wider audience of actors in the information society. Class teachers – and the specialist staff who support them – are all asking for more readily available and applicable IT to use with a wider range of pupils who have special educational needs. However, at present, their very specific voices as ICT users – and representatives of pupils with special educational needs as direct ICT users – are not being heard by the researchers who are maybe not only interested in what they have to say, but may also be in a position to already provide them with some of the solutions they are looking for.

The SEN-IST-NET project attempts to address what is seen by the consortium of project partners as a form of *vicious cycle*: appropriate hard and software solutions are not seen as being readily available to teachers, therefore these teachers are not motivated to investigate using any ICT solutions. Teachers do not develop their ICT competence and knowledge base and are therefore not linked into an ICT culture where they can contribute to debates. A lack of teachers' voices in ICT debates means they do not have as much impact on possible R&D developments as they could

usefully have. No input into debates from a classroom practitioner perspective means specialist appropriate solutions are not developed and so the circle turns again.

Whilst access to appropriate ICT information solutions is not the only factor in encouraging teachers to use ICT with pupils with special educational needs – policies and subsequent ICT infrastructure and support as outlined above being equally important components – it is a contributing factor and one which can be addressed in a number of ways at an international level using ICT networking solutions such as those in the SEN-IST-NET project.

Conclusions

The wealth of information provided within the ICT in SNE project and current information coming from the SEN-IST-NET, essentially provide descriptions and discussions of issues relating to firstly, policy and its practical implementation, secondly, information requirements and methods of accessing information and finally, co-operative arrangements at various levels and between various players.

The conclusions presented here seem particularly relevant to the TIEC conference theme of analysing the social, political, and technological changes and transformations, that are affecting the education. The conclusions below aim to highlight the challenges for education – particularly special education – within the next few years as well as identify some of the factors necessary for facilitating learning settings where *all* the individuals can learn effectively using ICT.

Policy, provision and practice

One of the crucial debates within the ICT research and development arena at present is the application of inclusive by design principles – that is the diverse range of users' needs are considered at the outset of designing hardware or software; their needs are not considered later and met as some form of adaptation to the already existing product.

In order to build a truly inclusive information society, educational approaches and appropriate technology must be developed that meets the requirements of all users, including those who have special educational needs. **The principle of inclusive by**

design needs to be applied during the planning and formation, implementation and evaluation of ICT policies, provisions and practices.

Weber (2001) argues that an *inclusive approach to the development of a new learning culture in general and to technology-enabled learning in particular* is required. Information on the needs of all potential users should inform the debates on the relationship between technological innovation and development and educational theory. The findings of this project support this viewpoint: **an understanding of ICT in SNE users' educational and technological needs should be the basis for the policies and infrastructure of ICT provision** which underpin the practice of teachers and the professionals who support them.

Access to information

Access to information is important; *access to the right sort of information is essential*. Whilst it is impossible to identify every ICT in SNE users' information requirements, information from this project suggests that there is a rubric of different forms of information that need to be made available more widely.

- ❖ **Information is required from and about all levels of ICT in SNE work:** international, national, regional, school, colleague/other teacher and pupil
- ❖ **Different types and formats of information are necessary** - different in terms of content, presentation levels, presentation medium, languages and also technical formats – in order to maximise accessibility.

The principle guiding the availability of access to information in ICT in SNE should be that all levels and types of **information should be accessible to all** - that is open in terms of content and technological format to as many different audiences as possible.

Co-operation

If the principles of policy and provision being designed to include all and information being made accessible to all are to be worked towards, then **the foundation for this work will be co-operation between different groups of ICT in SNE players.**

Increased co-operation between all levels of participants in the ICT in SNE field is called for: international, national, regional, school, support professional, teacher, pupil and their communities. The purposes of co-operation need to be varied: personal communication, sharing information, debate, provision, training, research and even policy development. Moreover, a greater range and diversity of co-operative arrangements are required: formal/informal, face to face/virtual, short-term/long-term, funded/unfunded.

ICT not only needs to be the focus or topic of increased co-operation, it needs to be more accessible to a wider audience as the means by which co-operation can develop.

Final comments

Despite the practical – and sometimes political – issues relating to the front line application of ICT in classrooms with pupils who have special educational needs, it is essential that all actors in the ICT field are aware of the importance of teachers and support professionals in SNE being involved in the process of developing policy, provision structures and even the technology that influences their work with pupils with special educational needs.

Information from the Agency's projects suggests that teachers' concerns and requests are not always being accounted for at an international (specifically EU), national, regional and even school level. If the dialogue between various groups of ICT actors can be facilitated to a greater extent, then a real step forward will have been made *towards a genuine barrier free information society that includes all its citizens.*

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Project questionnaire: www.european-agency.org/ict_sen_db/question.html

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SEN-IST-NET web portal: www.senist.net