

POLICY NOTE

ICT and Education *Part I*

ICT IN SCHOOLS IN TURKEY

September 2004

(Draft)

ICT in Schools in Turkey

Background

The source for this policy note “ICT in Schools in Turkey” is a rapidly growing body of innovative strategies and approaches being used worldwide. There is an array of experiences; good practices and lessons have been generated for the benefit of countries where ICT use in education has just begun.

Given the high investment costs required to introduce ICTs into schools, it is important for countries to learn from the experience of others to make good decisions and to avoid repeating the errors of others or losing opportunities.

This note draws from the experience of fifteen countries in North America, Europe, Asia and Latin America. They are United States, Canada, Australia, Italy, Hong Kong, Singapore, Philippines, Malaysia, South Korea, Thailand, Indonesia, Argentina, Chile, Venezuela and South Africa. The focus for Turkey is on the issues cited in the ICR¹ for the First Basic Education Project (financed by the World Bank) and the ICT Impact Study, published in June 2004² and financed under the First Basic Education Project.

This Policy Note (Policy Note I) covers issues related to overall policy environment.

- (i) Education Environment
- (ii) Policy and Regulatory Environment

The second Policy Note (II) deals with policy at the school management level.

- (iii) Policy and Strategy to help Schools integrate ICT into Teaching and Instruction
- (iv) Organization and Resource Management for ICT in Schools.

A third Policy Note (III) in this series details issues related to (i) Curriculum, Pedagogy and Content Development (ii) Technology, Infrastructure and

Connectivity (iii) Professional Development, and, (iv) Monitoring and Evaluation.

¹ Implementation Completion Report (SCL-43550) for the first phase of the Basic Education Project in the Republic of Turkey.

² Information Technology Classes in Basic Education Program - Impact Research (Final Report, April-June 2004).

Executive Summary

The emphasis placed on developing ICT policy in education varies from country to country. Some countries piloted ICT use in schools and trained teachers without having ICTs integrated in their Education Policy. Other countries have found it important to have a policy to serve as a framework and guide. However, the enabling environment and restrictive regulations (e.g. censorship laws, legal and regulatory framework for internet) dealing with ICT use in education need to be considered in detail.

A diverse range of policies and strategies have been developed in several countries so as to better integrate ICTs into schools.

(i) The key critical factor in successful integration of ICTs in schools across countries in Europe, North America and Asia is the creation of a responsive education system. A receptive education structure is one that is open to the evolving technological changes. To make the education environment more responsive to the needs of the knowledge based society, several changes are suggested.

The first is a change of direction based on creating new knowledge and information rather than on rote learning. Up until recently, the main function of school education has been to deliver to students the knowledge that has been accumulated throughout human history. But in a knowledge-based society, information is increasingly being developed and delivered by all members of society. For as long as schools maintain a learning system based on transmission of information, it will be difficult to develop the kind of intelligence essential for a successful knowledge based society.

The second change is to orient the education system to focus more on individual students. Currently, standardized textbooks and identical teaching methods are used in educating students who have different aptitudes and learning habits. In a knowledge-based society, the main focus of education is the individual student, which requires a differentiated approach to teaching and learning that vary according to the learning needs and interests of each of the students.

The third change is the introduction of more creative and self-directed education methods. The new kind of learning needed for the knowledge-based society is

related to knowledge that takes in to account real life situations and problems.³

(ii) To optimize the value of new technologies in schools, it is important to give opportunity and resources directly to teachers and students to find new ways to use the technology.

As technology advances, unless it brings with it an attitude shift towards learning, computers can not be properly used to enhance education quality. The traditional methods of teaching and learning are not optimized for the integration of ICT in education.

To get maximum value from new technologies, there has to be a shift in the attitudes governing education. Educators and teachers have to figure out new ways to take advantage of the fast evolving technology. It is imperative that policymakers give decision space and resources directly to teachers and students to find innovative ways to use the technology. A good model of this is the Network of Innovative schools in Canada (see below).⁴

(iii) A holistic approach that goes well beyond the technological dimension is needed to effectively integrate ICTs in education policy.

The development of new multimedia technologies and the growth of internet in recent years in particular have given students access to a vast range of informational resources. Successfully exploiting the potential of these new technologies depends far more on pedagogical and organizational issues than on the technologies themselves.

The introduction of ICTs has to be accompanied by far reaching reorganization of the learning structures. In addition, it is important that technological innovation is developed to serve education in diverse learning context, while respecting linguistic, cultural and social differences.

Although ICT infrastructure may be a necessary condition for successful ICT integration in education, it is not an end in itself. The ICT in education policy should consider other aspects, such as the curriculum assessment, professional development of teachers, research and development, ICT resources and fund generation.

³ Some of the schemes used worldwide are Project work (Singapore), Learning Paradigm Shift (South Korea), eLearning Commission (European Union).

⁴ Network of Innovative schools (NIS)- Initiative of Canadian Federal Government. Details in section 3.

(iv) In the face of intense competition, countries can no longer rely on the accumulation of capital and labor to sustain economic growth. The capacity of the workforce to generate new knowledge has to be continuously encouraged.

The ICT in Education Policy should be planned to complement other development strategies. ICT

education policy should not be formulated in isolation. It should be considered and implemented to complement and support other development strategies.

I. EDUCATION ENVIRONMENT

Overview

A diverse range of policies and strategies has been developed in several countries to integrate ICTs into schools.

The policy for integrating ICTs has to take into consideration: (i) the role of ICT in National Education Policy, (ii) the existing education system and ICT infrastructure, and, (iii) the economic and social/cultural context. The national ICT infrastructure support (connectivity and accessibility) also has a critical effect on the long-term implementation and sustainability of ICTs in schools.

Components of Education environment to help integrating ICT into education include the following:

1. Create an Open and Responsive Education System

A receptive education system helps in the successful implementation of ICTs in the schools. The education structure must be open to the evolving technological changes.

To make the education environment more responsive to the needs of the knowledge based society, some changes are suggested to the education system.

The first is a change of direction based on creating new knowledge and information rather than on rote learning. Up to now, the main function of school education has been to deliver knowledge accumulated throughout human history. But in a knowledge-based society, information is delivered and developed by the people. For as long as schools maintain the rote learning system of education, it will be difficult to develop new intelligence essential for a successful knowledge based society.

The second change is to have the education system focus on individual students. Currently, standardized textbooks and identical teaching methods are used in educating students who have different aptitudes and learning habits. In a knowledge-based society, the main focus of education is the individual student.

The third change is the introduction of a creative and self directed education methods. The new learning for the knowledge-based society is the living knowledge that takes in to account many factors, such as real life situations and problems.⁵

⁵ Korean Education and Research Information Service (*KERIS 2002 pp. 4-5*) is a government - subsidized institution, focusing on the use of ICT in education,

The Project work - Singapore⁶

1. Teaching and assessment methods are reviewed and modified continuously to nurture thinking skills, creativity and to encourage knowledge generation and application

The *Project Work*, implemented in schools since 2000, provides students with an integrated experience to explore inter-relationships and inter-connectedness among different disciplines. It encourages the application of creative and critical thinking skills, and provides opportunities to develop communication, collaborative and lifelong learning skills.

Learning Paradigm shift - South Korea⁷

2. In knowledge-based society, work and education are integrated. Thus, knowledge is produced not by a small elite class but by a mass of active workers in the workplace.

Recognizing the social paradigm shift, top-level decision makers have supported the long-term plan for ICT in education. This led to the country's ICT in education policies implemented in 1989 up to present

eLearning Commission - EU

3. The eLearning initiative of the European commission seeks to mobilize the educational communities in order to speed up the changes in the education and training system for Europe's move to a knowledge based economy.

As Viviane Reding, Commissioner for education and Culture, remarked "The member states of European Union have decided to work together to harmonize their policies in the field of education technology and share their experience. eLearning aims to support and coordinate their efforts and to accelerate the adaptation of education and training systems in Europe."

developing curriculum content and teacher training. KERIS recommended a number of changes to the education system in South Korea.

⁶ The Pivotal Role of teacher in ICT learning environment. Lim Cher Ping, Assistant Professor, National Institute of Education, Singapore

⁷ Okhwa Lee, Chungbuk National University, Seoul, South Korea

Effective Organization in schools - Malaysia⁸

4. The Ministry of Education (MOE) considers ICT as a means, not an end in itself. It assists more effective organizational structures in the schools (more autonomy to the heads of departments and teachers, more sharing among teachers, and less bureaucracy in the organization). It established stronger links between schools and society (open communication between schools and parents, and collaboration with industries and institutes of higher learning.)

2. The ICT in Education Policy should have the same vision as other Educational Policies and Initiatives

To make ICT an integral part of the education system and to ensure support for ICT programs, ICT in education policy should share the same vision as other educational policies and initiatives.

With a clear goal, ICT becomes part and parcel of education plans, ensuring its implementation. It also enables education stakeholders to examine opportunities for ICT in education.

In parallel, research should be done on the value that information technologies and new media add to the learning process. The objective is to increase the efficiency of learning for individuals and groups. The research work should integrate technological, cognitive, pedagogical and organizational aspects.⁹

It should be priority to take advantage of ICT to speed up necessary changes in education and training systems and that e-learning - learning enhanced by the use of Internet and new multimedia technologies - be available to all.

eEurope 2005 Policy

1. Successful integration of ICT into education and training systems is a main concern of EU leaders and an eEurope 2005 policy priority. Two key themes form the basis for EU's strategy in this field: Enhancing Education and Training.¹⁰

⁸ ICT in Malaysian Schools: Policies and Strategies. Chan Foong Mae, Principal Assistant Director, Communication and Training Sector, Educational Technology Division, Ministry of Education, Kuala Lumpur, Malaysia

⁹ Technology Enhanced Learning is a strategic objective of the Information Society Technologies and a research priority. Europa.eu.int

¹⁰ The European Commission Initiatives such as the eLearning Initiative and the eLearning Programme play a central role in building networks that share such experiences across Europe.

ICT Integration plan - Singapore

2. In Singapore the MP1 (ICT integration Plan) was implemented in 1997, the same year as the launching of the vision, "Thinking Schools, Learning Nation". Under this vision, the MOE has shifted from efficiency to ability driven education aimed at developing and harnessing the abilities and potential of every child. This vision is consistent with the objectives of MP1 to create a student centered learning environment, inculcate good values, and nurture thinking skills and creativity through formal and informal curricula.

Learning Paradigm changes in education system -- South Korea¹¹

3. The Objectives of the ICT in education policies are consistent with the changes to the education system proposed by KERIS in 2002, covering (i) a change in direction based on learning that is geared towards construction and generation of knowledge; (ii) a focus on students; and (iii) a creative and self directed education approach where education stakeholders are given more autonomy.

3. ICT in Education Policy should be driven by a vision that targets a change in the learning paradigm

An ICT in Education Policy should be driven by a vision that can be translated into action. It should target at realistic and manageable goals that lead to successful programme implementation.

Realistic goals are observable and measurable. During the different phases of ICT integration, these goals can be assessed to identify gaps and adopt strategies to address them.

As technology advances, unless it brings with it an attitude shift towards learning, ICTs can not be properly used to enhance education quality. The old models of traditional rote method of learning do not optimize the integration of ICT in education.

To get maximum value from new technologies, there has to be a shift in the attitudes governing education. Educators and teachers have to figure out new ways to take advantage of the fast evolving technology. It is imperative that we give space and resources directly to teachers and students to find innovative ways to use the technology.

¹¹ KERIS has proposed a number of changes for effective ICT integration in schools in South Korea.

Network of Innovative schools(NIS) - Canada

In acknowledging that innovation is the key, the Network of Innovative schools (NIS)¹² - an initiative of the Canadian Federal government, recognizes and supports schools which have successfully integrated ICT into classroom in innovative ways. The federal government contributes up to \$ 10K per year to schools in the network to continue their innovative approaches and recognizes the capacity of these schools to act as models for increasing the application of ICT and internet in the classrooms.

Education Policy Vision broadens the learning paradigm

It consists of four main goals:

1. Enhance learning between school and the world around it, so as to expand and enrich the learning environment: Teachers and students can access a wealth of educational resources outside the school and collaborate with other educational institutions – local and foreign, and the community at large. With these new learning connections, students develop appropriate perspectives on working and living in an increasingly borderless and complex world.
2. Encourage creative thinking, lifelong learning and social responsibility: Students develop competencies in accessing, analyzing and applying information, and cultivate independent thinking. ICT-based learning strategies help to develop the ability to think creatively, cooperate with one another and to make sound value judgments.
3. Generate innovation in education: The integration of ICT-based teaching and learning approaches stimulates innovation and encourages new curricular and assessment methods to meet the objectives of education. In addition, provide schools with autonomy to use ICT resources flexibly to meet the needs of the students.
4. Promote administrative and management excellence in the education system: Encourage ICT usage to promote efficient communication within the school, among schools and between schools and the MOE. Use ICT to enhance

¹² Network of Innovative schools (NIS) – Initiative of Canadian Federal government. NIS also encourages participation in research, mentoring among teachers and schools and the sharing of innovative practices in integrating ICT into the curriculum and education system. NIS showcases its best practices in ICT thereby promoting science and technology in Canada. Schools and teachers are encouraged to engage in projects which demonstrate innovative ways of using IT in classroom learning.

school administration and effective decision making at all levels.¹³

The European Commission also has been very active in supporting and complementing the efforts of EU member states in this field. It has gained considerable experience in encouraging co-operation and exchange of good practice at a European level.

European Commission Initiative

Since its adoption by the European Commission in 2001, the Communication entitled , “Making a European Area of Lifelong learning a Reality” has been a guiding principle for the development of education and training measures across Europe. This document stress the need for EU member states to adapt their formal education and training systems to the demands of the modern environment, to break down barriers between different forms of learning and to give all EU citizens the chance to develop ICT skills.¹⁴

4. A holistic approach to ICT in education policy

A holistic approach to ICT in education policy that goes beyond a technological dimension.

The development of new multimedia technologies and the growth of internet in recent years has given students access to a vast range of information and resources. Successfully exploiting the potential of these new technologies depends far more on pedagogical and organizational issues than on the technologies themselves.

The introduction of ICTs has to be accompanied by far reaching reorganization of the learning structures. In addition, it is important that technological innovation is developed to serve education in diverse learning context, while respecting linguistic, cultural and social differences.

Although ICT infrastructure may be a necessary condition for successful ICT integration in education, it is not an end in itself. The ICT in education policy should consider other aspects, such as the curriculum assessment, professional development of teachers, research and development, ICT resources and fund generation.

¹³ Based on the vision, “Thinking Schools, Learning Nation”, the blueprint for MP1 in Singapore

¹⁴ The report, adopted by the Ministers of Education in 2001, set a number of shared objectives to be achieved by 2010.

Key areas in Education Policy

The ICT plan for Basic education should focus on seven key areas: Research and development, use of innovative technologies in education and training, technology integration in the curriculum, teacher training in the design, production and use of ICT-based instructional material, infrastructure development, technical support and fund generation, particularly through non-traditional funding schemes.¹⁵

The other areas to consider are: Assessment of curriculum, learning resources, teacher development and physical and technological infrastructure.

ICT Plan - Thailand¹⁶

MOE's ICT plan focuses on ICT use in four areas – improving quality of teaching and learning, developing education management and administration system, building the capacity of education personnel, and developing educational ICT infrastructure.

5. ICT in Education Policy planned to complement other development strategies

ICT in education policy should not be formulated in isolation. It should be planned and implemented to complement and support other development strategies.

In the face of intense competition, countries can no longer rely on the accumulation of capital and labor to sustain economic growth. The capacity of the workforce to generate new knowledge should be continuously upgraded. Each country has to redefine itself to remain competitive and this requires it to move towards more value-added industries that produce high-tech and knowledge intensive products.

So equipping the workforce with the necessary skills for better job opportunities and for the competitiveness of the economy should be a major concern of employment policies. These initiatives should cross the traditional borders of school

¹⁵ ICT Integration in education in Philippines. Victoria L. Tinio, Director of E-learning, Foundation for Information Technology Education and Development Inc., Manila, Philippines

¹⁶ Teacher Training and the use of ICTs. Pornpun Waitayangkoon, Assistant to the president, The Institute for the Promotion of Teaching Science and Technology, Bangkok, Thailand

education, higher education, vocational training and adult learning.¹⁷

A sustained, productivity-driven growth can only be achieved with a technologically literate workforce that is capable of critical and independent thinking.

Vision 2020 applications - Malaysia

1. Consistent with Vision 2020, seven flagship application were introduced in 1997 as part of the overall plan to jumpstart the country's leap into the ICT Age.

National Policies - Singapore

2. National policies to nurture the country's knowledge based economy and to work towards becoming a knowledge hub in the region and beyond have been formulated. Efforts in support of these polices include enhancing the national innovative system, entrepreneurship and educational capability (Toh, Tang and Choo, 2000).

Education Master Plan - Thailand

3. MOE's Education Master plan focuses on the use of ICT as a major tool for education reform. The strategy supports MOE's 2004-2006 mission to improve the quality and effectiveness of student learning.¹⁸ This strategy supports the decentralization of the MOE administration and management, from the ministerial to the schools and educational service area levels.

6. Identify and Document successful worldwide usage of ICT in Education to create awareness

Policy makers and stakeholders are more likely to support ICT in education policy when real life examples are identified, documented and presented.

By making policy makers and stakeholders aware of and updated on the benefits of ICT to education, advocacy for the acceptance of ICT use in education is strengthened.

¹⁷ This is a major issue of EU employment policies. European Employment Policies. Europa.Eu.int

¹⁸ It focuses on areas in e-education, e-Society and e-Government. The e-education and e-Society strategies provide for the use of ICT infrastructure in accessing information and knowledge to upgrade the basic capacity of the Thai society, reduce the digital divide and promote learning in the Thai society. The e-government strategy utilizing ICT for good governance, emphasizes improvement and development of the administration and management systems in all government organizations.

For example, in United States students are using software from Blackboard Inc.¹⁹ that is changing the very notion of going to school. (See box). The technology does not replace classroom instruction, as many educational software and online schools do. Instead, Blackboard is designed to complement what happens in class. It gives students one centralized site on the net to get course outlines, lecture notes, and reading material. It also lets them take tests, hand in papers, watch videos, and participate in cyber-discussions that can bolster in-person lectures.

Students go online to get assignments, take tests, listen to Spanish language drills, even join in a discussion of Dostoyevsky's *Crime and Punishment*. They can pursue classroom activity anytime and anyplace.

The students take for granted a technology that earlier generations of collegians may not even know exists.

ICT in Education Awareness- Singapore

1. Policymakers and stakeholder in Singapore are aware of ICT in education blueprints from other countries, some of which are : (i) United States' \$200 million Technology Literacy Challenge Fund to give American students access to computers. Over 6000 schools will be linked. (ii) Major programmes for ICT in education in Germany, France, Britain and Italy, including a programme in Italy to install multi media workstations and Internet connections in 15,000 schools by the year 2000, with an investment of about \$850 million. (iii) Finland, with the highest connections to the Internet in the world, has launched a five-year strategy in "Education, Training and Research in the Information Society".

Blackboard – United States

2. Blackboard's software is used in more than 2,000 schools including more than half of all U.S. colleges and universities. Blackboard is used to supplement not replace classroom instruction. It puts the course information on the net. Students can get their syllabus, assignments, reading material, and grades at a course's Web site as well as take tests and hand in papers online.

¹⁹ Big Program on Campus. Business Week, September 20, 2004

II. POLICY AND REGULATORY ENVIRONMENT

Overview

The emphasis placed on developing ICT policy in education varies from country to country. Some countries piloted ICT use in schools and trained teachers without an ICT in Education Policy. Other countries have found it important to have a policy to serve as a framework and guide. Malaysia and Singapore carried out pilot studies prior to launching ICT in Education Policies.

However, the enabling environment and restrictive regulations (e.g. censorship laws, legal and regulatory framework for internet) dealing with ICT use in education need to be examined in detail.

As ICT in Education Policy is an integral part of the National ICT Policy, the MOE should work closely with other government organizations, especially those in charge of implementing national policies on ICT and Telecommunications.²⁰

Components of Policy and Regulatory environment to help integrating ICT into education include the following:

1. Define clearly the roles and responsibility of all Departments

Harmonized implementation of ICT in education programmes can be achieved by defining clearly the roles and responsibilities of all departments (within the MOE and other relevant ministerial departments) in the ICT implementation plan.

The ICT master plan should show clearly the different components of project activities, including budget allocation, manpower requirements and timetables.

In Turkey²¹, Computer Educatory Formators list problems essentially stemming from ‘uncertainty of their powers and responsibilities with no authority to impose sanctions.’ There is also a problem of coordination as only about one third of the formators meet regularly with the Provincial National Education Administrators whereas the rest meet with them ‘if need arises’ or have never met. The formators have frequently cited in their

complaints ‘lack of interest by school principals and teachers’. The lack of interest problem has to be considered in the context of uncertainty of powers and responsibility of the Formators.

In Turkey²², almost half (46%) of the computer education formators state that they come across expectations that do not match their responsibilities. The most common among the expectations that do not match with their responsibilities is “the demand for solving hardware problem.” The technical support service to be provided by hardware firms is expected from provincial educatory computer formators. This demand comes not only from schools but also from the administrators at the Provincial Directorate of National Education.

The circulars issued by the Ministry do not list “solving hardware problems” among the responsibility of the educators. The fact that educatory formators consider “solving hardware problems” both within and outside their scope of responsibility clearly demonstrates the uncertainty with regard to this issue. Further, one fifth of the Provincial Educatory Formators interviewed state that they have no “distinctive responsibilities.”

Multimedia Super Corridor- Malaysia

1. Although the specific roles of concerned agencies were not clearly defined when the Multimedia Super Corridor²³ (MSC) Applications were launched, the following general roles were designated:

- MOE as lead agency of the flagship applications.
- MDC as coordinator of the MSC Flagship applications
- A consortium short listed by the lead agency to deliver solution requested through the Concept Requests
- Central agencies with responsibilities for procurement and legal aspects, such as the treasury and the Attorney General’s chambers.

The MDC invited all government agencies and consortia involved to help clarify and delineate roles and responsibilities. As a result of this exercise, many of the

²⁰ Lim Cher Ping, Assistant Professor, National Institute of Education, Singapore

²¹ Information Technology Classes – Impact Research Report April-June 2004. The most important problems the provincial computer educators encounter in performing their duties. Section 3.1.3 Page 27

²² Impact Research Report. Section 3.1.3 pg 28

²³ Malaysia is implementing its “Multimedia Super Corridor (MSC)” project, as part of its aim to become a fully industrialized country by 2020. One of the aspects of the project is the “Smart School” initiative. This aims to include all 7,000 primary schools and 1,500 secondary schools by 2010.

implementation problems identified by the lead agencies and the consortia, such as manpower shortage, unclear government procedures and processes, and cross-flagship integration requirement were resolved.

2. The MOE appointed four sub-committees responsible for specific areas in the ICT in education master plan. To ensure effective policy implementation, the sub-committees were supervised and directed by the MOE Deputy Director, serving as Chief Information officer of relevant departments. However, frequent transfers of senior executives between departments affected the continuity of the work plan. - *Thailand*

2. Transform Education Policy into Action

Demonstration schools (from the first phase) should serve as models for ICT integration.

Phased implementation of ICT in education policy ensures that the implementation process is manageable and the development of best practices and lessons learned is gradual. It also provides opportunity for evaluation so that the policy can be revised and fine-tuned.

Demonstration of Pilot schools from the first phase could encourage their staff to share their experiences and expertise with staff from other schools and regions. Staff from Pilot schools could be posted temporarily in other schools that wish to start ICT integration. Alternatively, staff from other schools could be attached to these demonstration schools to observe best practices and immerse themselves in a culture that supports ICT integration.

Strong consideration should be given to deploying the Computer Formators to schools before the set up of IT classes proceeds, under phase II in Turkey.²⁴ This will enable the formators to better comprehend the system to be set up and the technical support to be received as well as to provide guidance to the school management on the deficiencies and wrongdoings that may stem from the procurement company.

MPI Phases in Singapore

MPI in Singapore consisted of three phases. Schools with a history of effective ICT integration were chosen as demonstration schools, also known as Phase I schools. Phase II schools were identified based on the school principals' evaluation of staff readiness for the new initiative. Schools were given the flexibility to decide on the pace of ICT integration.²⁵

²⁴ Impact Research Report – Information Technology Classes in Basic Education in Turkey. April-June 2004

²⁵ A four tier-fan teacher training model was put in place to acquaint teachers with ICT integration. This started

3. Filtering of undesirable websites from the internet

Filtering of undesirable websites from the internet is important to prevent their harmful influence on younger students.

Filtering is particularly important for young students who are unable to discern the veracity and reliability of the information.

Although an excellent idea, filtering is not fool proof and internet-savvy children can still get around it. Some schools adopt extreme measures such as keeping the students off the internet entirely unless supervised by teachers. However, such measures deprive students of essential tools for survival in the 21st century.

Internet Filtering - Singapore

1. One of the MDA's main concern is access to pornography on the internet, especially by children and minors. Its regulatory focus is on mass impact web sites that distribute pornography²⁶. The three ISPs – Pacific Internet, Sing Net and Stab Hub have launched their own Family Access Networks (FAN) that offer services to filter out most undesirable or pornographic sites. They are the Cyber Guard Family Access, Family Online and Infinity Family Access respectively.²⁷

4. Educate students regarding the usage of Internet

The Governments have followed varied strategies to deal with students use of internet. However most have decided against censorship and encourage supervised use of Internet. For example, in order to promote the Internet use for education, business and entertainment, the Malaysian government decided against censorship of the internet.

In general, education is the main tool to prevent misuse and abuse of the Internet.

with 60 senior ICT instructors from the Education Technology Division (ETD) who visited schools to train and work with teachers. The instructors together with teachers and heads of ICT departments from Phase I schools went to Phase II schools. Together with Phase II school teachers, they went to Phase III schools

²⁶ The Internet code of Practice identifies what the community regards as offensive, that is, pornography, violence and material that might undermine Singapore's racial and religious harmony. It also spells out the obligations of the Internet service providers (ISPs) and content providers (MDA, 2003).

²⁷ Apart from filter provided by ISPs, there are commercially available software programmes that help to block out unsuitable websites. Software filters block harmful websites such as those on pornography, drugs and hate.

Internet Education

Education concerning the dangers of internet offers better protection than any software or hardware device. Schools and parents should guide students in surfing the Internet and discuss Internet issues with them. (Turow & Nir, 2000).

The students themselves prefer educational measures as apposed to restricted access to information and resources on the internet. Teenagers favor educational strategies over control measures, as shown in a survey conducted by the National Institute of Education (NIE) in 2001²⁸. A volunteer organization that support parents, teachers and students is the Parents Advisory Group for the Internet (PAGi)²⁹.

Schools should also allow children to share experiences online and give them opportunities to show teachers and parents what they know. Teachers and parents also need to be trained and supported so that they can educate students and children about Internet safety. Government organizations, volunteer organizations and schools can provide training and support.

5. Improving Access and Equity to narrow the digital divide

To narrow the digital divide, ICT in education policy should complement other government initiatives, such as public education in ICT, donation of computers and provision of free Internet access.

Investment in ICT facilities in schools will increase access to computers and the Internet, particularly for students from poor socio-economic backgrounds. School sometimes run evening IT classes or just keep computer labs open in the evening to give access to students, parents and other members of the community.

ICT Education Master Plan - Singapore

1. The ICT in education Master Plan helps to narrow the digital divide by increasing ICT use in the curriculum, lowering the student-computer ratio, enhancing student access to computers by providing more open access

²⁸ The items 'discuss with children the dangers on the Internet' and 'learning more about the Internet' (two educational strategies) were rated as most desirable by teenagers; while the items 'stop child from using computer' and 'complain to Internet service provider' (two control measures) were rated as the least desirable. (Lim, Khoo & Willimas, In Press).

²⁹ Parents Advisory Group for the Internet (PAGi) <http://www.pagi.org.sg/>. Volunteers assist in various activities such as exhibitions, workshops, talks and production of useful references on online safety, including handbooks and VCDs. These activities are usually carried out in public libraries, community centers and schools.

areas, and providing cheaper access to the internet as a result of school-industry partnerships. All students, regardless of socio-economic backgrounds, have equal access to ICT facilities in the schools.

Government Support – South Korea

2. The government provided PCs and financial support to students from poor families, enabling them to learn how to use computers and the Internet. 500,000 children from low-income families were given opportunities for computer lessons and practice. In addition, outstanding students received free PCs and financial rewards.

