Component 3
Management and Financing
Sound management and financing of ICT in education policy are necessary conditions for the effective integration of ICT in schools. All countries face the technological challenges of buying appropriate hardware and courseware, getting adequate bandwidth for online learning, and obtaining state-of-the-art ICT learning and teaching tools. However, successful ICT integration also depends on the quality of the rest of the tools, the learning environment and the participants themselves. Management and financial strategies for effective ICT integration in education must take into account a wide range of factors, including events, activities, contents, and interpersonal processes that are within the context under which ICT is used. This component focuses on the following issues of management and financing: (i) harmonization of ICT in education policies with other policies, (ii) leadership and management, (iii) dichotomy between educators and technologists; (iv) resources at the ministerial and school levels, (v) resources from donor agencies and the private sector, and (vi) strategies to ensure sustainability.
Lessons learned

Based on the experiences of the six countries with respect to management and financing, the following are the lessons learned:

1. Leadership and Management
   - Having a champion at all levels in the education system promotes ICT acceptance.
   - Including ‘ICT in Education’ as an important component in the administrator development programme supports the introduction of innovative uses of ICT in schools.

2. Harmonizing ICT in Education Programme with Other ICT and/or Education Initiatives/Projects
   - To avoid duplication of work and dilution of funds, there should be coordination of ICT in education projects and sharing of information on ICT.

3. Dichotomy between Educators and Technologists
   - To ensure that ICT in education projects are not just technology-driven, they should be managed by a team composed of educators and technologists.

4. Resources at Ministerial and School Levels
   - To ensure the site readiness of all schools, there must be an initial financial investment by the government at the national level, especially in basic ICT infrastructure and resources.
   - Every school is different and each one should be given some autonomy to select ICT resources that are most suitable to the needs of teachers and students.
   - Investments in ICT infrastructure and resources in schools create an environment that is conducive to learning.
   - The MOE should be encouraged to establish a standard budget based on school size and existing resources rather than to apply one formula for all schools.

5. Resources from Donor Agencies and the Private Sector
   - Financial and resource support for the implementation of ICT in education policy is mobilized if school-industry partnership is an integral part of such policy. In addition, schools are able to explore and experience emerging technologies and pedagogies.

6. Strategies to Ensure Sustainability
   - Preparing and disseminating guidelines on how to source funds empower schools to look for their own funds and to identify expertise to promote sustainability.
Synthesis of Experiences

Issue 1
Leadership and Management

Having a champion at all levels in the education system promotes ICT acceptance

Champions are dedicated persons who are motivated by the satisfaction of contributing to the enhancement of student learning. They build a culture of innovation and encourage ICT use in teaching and learning. Champions should be identified at all levels and appointed officially and their roles and responsibilities should be clearly stated. The role of champions in ICT in education programmes is important and they should have the support of their superiors and peers. However, there is also a need to ensure that the long-term success of a programme does not depend solely on the abilities and actions of a few individuals. Care must be taken to ensure continuity in leadership.

a. Malaysia: Champions are found at different levels. At the ministerial level, the Minister is kept informed on a regular basis about the progress of the Smart School project. The other champions are the Secretary-General of Education, in his capacity as Chairman of the Smart School Steering Committee; the Director of the Ministry’s Educational Technology Division, who served as Project Director during the pilot phase; and the Deputy Director of the Educational Technology Division, who is a champion at the operational level.

At the state level, the champions are the Deputy Director of the State Education Department (the second highest ranking officer after the Director) who is Head of the Smart School Strategic Support Team; and his deputy, the Principal Assistant Director who is head of the State Education Resource Centre. Members of the Strategic Support Team represent State Education Departments and the State Education Resource Centres. The State Strategic Support Teams meet with the Ministry’s Smart School Team on a regular basis.

At the school level, champions hold the position of head of school. The head is the prime change motivator and change manager and, as head of the school change management team, is responsible for developing both short-term and long-term change management plans and activities for all key stakeholders in the school. The other team members are deputy school heads, resource teachers for Bahasa Melayu, English Language, Science and Mathematics, school IT coordinators, and school IT technicians. They meet at least once a year at change management coordination meetings conducted by the Smart School Team.

b. Thailand: In many cases, champions at the provincial, regional and national levels are identified through contests and competitions on ICT in education. These include the Outstanding Teachers Search, Software Contest, Website Competition, and Model
Teachers Search. However, many champions are not sufficiently supported in their schools or provinces. For example, while teacher champions are invited to contribute to other schools or educational institutions to demonstrate their innovative projects, their routine workload remains relatively heavy. Their contribution outside the school is not considered as part of their workload. In this case, some champions may not be willing to share their best practices and projects with other schools. Sometimes even the transfer of innovations to other classrooms within the same school encounters resistance, especially when it lacks the support of the principal or peer teachers.

Research studies, such as the Second Information Technology in Education Study or SITES M1 and M2, suggest that in some cases, the school administrator’s ICT vision is not always supportive of classroom innovations using ICT.

lessonlearned2

Including ‘ICT in Education’ as an important component in the development programme for administrator supports the introduction of innovative uses of ICT in schools

a. Thailand: At the school level, the principals or principal-to-be have to undergo training provided by the Institute of School Administrator Development. The training courses cover all matters related to school administration and management, including general use of ICT. However, the courses do not focus on teaching and learning using ICT.
Harmonizing ICT in Education Programme with Other ICT and/or Education Initiatives/Projects

To avoid duplication of work and dilution of funds, there should be coordination of ICT in education projects and sharing of information on ICT.

a. **Malaysia**: Major projects in the Smart School Master Roll-out Plan have been properly coordinated. In addition, the plan gives due consideration to current trends and needs, such as Open Source Software, Open Standards, computer aids, mobile phones and Internet access by means of satellite and microwave.

Current educational programmes involving ICT include the Smart School Project, the teaching of Science and Mathematics in English, the school computerization programme, and the Universal Service Provision Project, all of which are part of MOE’s goal to “provide equal access to quality education to every child, irrespective of background, religion or ethnicity”. The Teaching of Science and Mathematics in English Programme was introduced in 2002 and implemented in 2003 in all schools in the country. The Government recognizes that English is the language of the Internet and that students need to be able to access materials from the Internet competently in order to keep pace with developments in science and technology. The School Computerization Programme is meant to provide every school with one to three computer laboratories (20 computers per laboratory), depending on the student population. The goal is to have every school run ICT literacy classes.

The Universal Service Provision Project helps to bridge the digital gap between rural and urban schools. The pilot project, involving 220 schools in Sabah and Sarawak, includes the provision of basic infrastructure, including electricity, telephone lines and Internet access, computers, telephones and other related equipment. The project will be expanded into a nationwide SchoolNet for the 10,000 schools in the country.
Integrating ICTs into Education

Dichotomy between Educators and Technologists

To ensure that ICT in education projects are not just technology-driven, they should be managed by a team composed of educators and technologists.

Ideally, ICT in education projects should be conceptualized by a mixed group of educators and ICT experts, with the educators capitalizing on existing and cutting edge technology while the technologists take into account teaching and learning issues concerned with ICT use in the classroom. ICT in education projects should be education-driven, not technology-driven.

a. Malaysia: A joint Ministry–Industry Task Force wrote the Smart School Conceptual Blueprint. The task force included MOE officials from various divisions (e.g. Curriculum Development Centre, Teacher Education Division, Examinations Syndicate and Educational Technology Division) and representatives from leading ICT companies (e.g. Microsoft, Oracle, IBM and Sun Microsystems). The Smart School Pilot Project Team was made up mostly of educators although several systems analysts were included to help monitor the technology infrastructure and support service components of the Smart School Integrated Solution. The Smart School Development Team, which will implement the roll-out of the Smart School, also has a mixed membership consisting of educators and systems analysts. The school IT Coordinator is usually a teacher with ICT experience. The Ministry has an on-going programme to upgrade ICT competency among teachers, when necessary. An IT technician assists the school IT Coordinator.

b. Thailand: Based on IPST’s experience in curriculum development and teacher professional development, the key personnel that have to be involved include subject content specialists at university level, experienced teachers in each subject area, science and mathematics educational supervisors, science equipment designers, and educational technologists. This can be seen in IPST’s current teacher professional development programme that aims to train science and mathematics teachers in integrating ICT in their subject areas. The task of integrating ICT in the teaching and learning process requires knowledge of the subject matter, ICT skills, and pedagogical skills. It is difficult to find instructors who possess all these skills. IPST curriculum developers have to work in collaboration with science and mathematics trainers and educational technologists from universities and Rajabhat Institutes for effective delivery of training courses. ICT personnel are not suited to this kind of programme although they are able to work well on courses focusing on the use of ICT tools.
To ensure the site readiness of all schools, there must be adequate initial financial investment by the government at the national level, especially on basic ICT infrastructure and resources.

It is important to ensure the site readiness of schools, in terms of manpower, funds and technological infrastructure.

a. **Indonesia**: To facilitate the integration of ICT in education, the Government has allocated funds in the form of block grants. However, block grants are made available to a small number of schools only. The recipient schools use their respective grants to purchase hardware and software, prepare ICT personnel through training workshops, and support the maintenance, care and management of ICT equipment. It would be more helpful if the Government will allocate a special fund for implementing ICT in education from the national budget.

b. **Malaysia**: The Government provided funds for the Smart School Project, allocating RM400 million for the pilot project, of which RM100 million was for the training of administrators and teachers in the Smart School Concept, and RM300 million for the implementation of the Smart School Integrated Solution in 87 schools, under an agreement signed between the Government and the shortlisted consortium. The components of the Smart School Integrated Solution and are as follows: Teaching-Learning Materials; Smart School Management System; Technology Infrastructure (IT and non-IT Equipment, Local Area Network, Wide Area Network, Communications); Training in the Use of SSIS Components; Support Services (Help Desk, Preventive and Corrective Maintenance) and Project Management, Business Process Re-engineering, and Systems Integration.

c. **Philippines**: The General Appropriations Act (GAA) is the primary financing instrument for the DepEd Computerization Programme, which began in 1996. To date, DepEd has deployed hardware, printers, office software and educational CD-ROMs and has conducted teacher training on basic computer literacy for 986 of the over 4,500 public secondary schools. In 2002, it received US$3.1 million to computerize an additional 258 schools. To date, 56.4% of public secondary schools have at least one computer. DepEd estimates that by the end of 2005, 75% of public secondary schools will have computers. Once this target has been reached, the computerization programme will focus on public primary schools.

The Science Education Institute (SEI) at DOST has also been instrumental in enhancing ICT resources of public schools. Beginning in 1994, it has computerized 303 public high schools and continues to allocate between US$400,000 and US$600,000 annually for ICT facilities and ICT skills enhancement. Other SEI-DOST programmes include the Mobile IT Classroom (targeted at public primary schools), the ICT-Mediated S&T Learning Programme (for public primary and secondary schools), the Mini Computer Laboratory (for public primary and secondary schools), and Computer-Based Teaching Modules Development (for public secondary schools). The last one consists of curriculum-
specific lessons in General Science, Biology, Chemistry and Physics, and has been distributed to 1,477 public secondary schools nationwide.

d. Singapore: With a budget of S$2 billion, MP1 was implemented to network all schools, equip them with at least one computer for every five students and train all teachers in ICT integration. The networking enabled access to courseware, the Internet and digitized media resources in every classroom and in all learning areas in the school. It also allowed the sharing of teaching resources within and between schools in Singapore.

e. South Korea: Although the ICT infrastructure was constructed in accordance with the plan for 2000, it caused financial difficulties in Provincial Offices of Education, some of which issued public loans or incurred debts in the process.

The Ministry of Education and Human Resources Development took necessary measures to reduce the financial strain on the Provincial Offices of Education and recommended that a substantial part of the central government’s subsidy be used for infrastructure construction for ICT use in education. As this was not a compulsory guideline, the financial contributions for infrastructure construction were not even. For this reason, the Ministry of Education and Human Resources Development defined standard expenses for unit projects and revised the enforcement rules for the subsidy. The Ministry handed over 450 billion Won to the local governments as subsidy for local educational expenses in April 2001.

The Ministry also defined enforcement guidelines for subsidies to ensure the effective promotion of ICT use in education, as follows: 40% for infrastructure construction (based on the number of schools); 30% for reinforced education for ICT use (based on the number of students); 15% for maintenance and repair of PCs and other equipment (based on the number of PCs); and 15% for ICT use in educational administration (based on the number of schools).
By recognizing that every school is different, better ICT integration in the school curriculum is ensured.

a. **Malaysia**: Initially, the State Education Departments did not make specific financial allocations for pilot schools in the Smart School Pilot Project in their states and instead they utilized available funds. The Pilot Project Team helped out by requesting for specific allocations to be set aside for the states to use, for example, for replacing equipment not covered by the Smart School Pilot Project Agreement and for improving wiring and lightning detectors in the pilot schools. As the project proceeded, the Ministry’s Finance Division assigned special status to all the pilot schools, thereby allowing them a certain level of autonomy in school expenditure.

b. **Singapore**: Schools are provided with basic technological infrastructures and are given the autonomy to decide on the kind of ICT resources and tools that they should acquire, based on their own visions and analyses of their students’ learning needs. This is particularly evident in MP2 that allows schools to have greater autonomy and flexibility in using ICT funds.

Investments in ICT infrastructure and resources in schools create an environment that is conducive to learning

Larger classrooms can accommodate more computers and provide teachers with more possibilities for ICT-based learning activities.

a. **Singapore**: Under the Programme for Rebuilding and Improving Existing Schools (PRIME), schools underwent redevelopment and re-equipment. The facilities included computer laboratories, media resource libraries, ICT learning resource rooms, larger classrooms, pastoral care rooms and health and fitness rooms. S$4.5 billion of the MOE budget was allocated for the programme that also included the construction of extension blocks, alteration of existing school buildings, and construction of new buildings. Construction was carried out in phases, determined by the age of the school, the state of existing facilities in the school, and the availability and suitability of the school site.
The MOE should be encouraged to establish a standard budget based on school size and existing resources rather than to apply one formula for all schools

In some countries, large and famous schools have fewer financial problems compared with small ones. Therefore, the allocation of budget to schools should move away from a one-size-fits-all formula.

a. Thailand: Two types of budgets are allocated for schools: one is a fixed cost which is based on school projects and activities, and the other is a variable cost which is based on the number of students. Large schools receive more budget than smaller ones. However, most schools, regardless of size, do not receive adequate funding from the Government. It is the responsibility of the school administrators to manage their own financial resources and handle their budget constraints.

Several organizations, such as alumni associations, parent-teacher associations, local communities or political groups, have become supplementary sources of funds for the school budget. Large schools generally have advantages in obtaining outside funding. In many cases, the ICT infrastructure is dependent upon the volume of funding a school is able to secure and the amount allotted to different school activities, including administration, teaching and learning, and personnel development.
Partnerships with the private sector, statutory boards and government bodies provide schools with opportunities and perspectives on how ICT can be integrated in the school curriculum to enhance the learning experiences of students. The signing of an MoU could be an important first step towards school-industry partnership. Support from individual industries could be financial or in kind.

a. Indonesia: Since the national budget for education is not quite enough to support ICT integration in education, the Government encourages private sector involvement, with the MOE coordinating their participation. Examples of such companies are PT Indosat, PT Telkom Indonesia, Microsoft Indonesia and ISP of Indonesia.

b. Malaysia: Funding models from the private sector, as discussed during negotiations for the MSC Flagship initiative, included “Build-Operate-Transfer”, “Build-Operate-Own” and “Build-Operate-Jointly Own”. In the case of the Smart School Project, after several negotiations, the Government finally settled for a straightforward direct purchase model. Seven local members of the consortium formed a joint venture company, with the three multinational companies becoming subcontractors to the joint venture company. The IPR to the Smart School Integrated Solution and all its components will be passed on to the Government upon the Government’s acceptance of the solution.

In the original Smart School Implementation Plan, the schools would be empowered to source their own funds and expertise to “smartize” their schools. The MOE would act as architect and motivator by providing guidelines to help schools become Smart Schools. Now that the pilot project has ended, there are indications that many non-pilot schools are able to become Smart Schools on their own initiative. Some schools have obtained support from federal and state departments, while others have relied on patronage from the private sector (e.g. banks). The parent-teacher associations have contributed enough hardware to enable their schools to apply to the Ministry for installation of the Smart School Applications Software.

c. Philippines: The Government does not shoulder the total cost of integrating ICT in schools, although national budgetary support is in fact needed. The Government passed the Adopt-a-School Act in 1998 in which many MNCs participated. The Japanese Government, an Adopt-a-School partner, provided assistance totalling US$12 million dollars for hardware, software and basic computer literacy training to 1,000 public secondary schools in 2001.
The project “PCs for Public Schools”, implemented through the DTI, began deployment in 2002 and was completed in 2003. Another 1,000 schools will be given computer laboratories in 2004-2005 through this project.

Under consideration by ITECC are alternative financing schemes, such as an Internet Caf Voucher System and a Service Contracting Scheme involving commercial ICT providers. Other proposed measures include legislation to institute tax incentives for ICT vendors and suppliers of electricity, and automatic appropriation to schools with ICT facilities from the Local School Board Fund and/or the City/Municipal/Provincial Fund. Various groups are also lobbying for the institutionalization of educational discounts on hardware, software, telephone service, and Internet access. Lobbying also continues for an increase in the national budgetary appropriation for education in general.

d. Singapore: The ICT in Education Master Plan mobilized financial and resource support from private organizations and statutory boards, such as the IDA which initiated the FastTrack@School Programme. The programme encouraged industry partners to work with schools to develop useful and relevant broadband education content for teaching and the curriculum. A total of S$7.5 million was allocated under the pilot project for broadband access at schools and homes, as well as content on Singapore ONE and Adopt-A-School initiatives.

The School-Industry Partnership Scheme (SCHIPS), signed between the MOE and industry and initiated under MP1 in 1997, aimed to promote the development of Singapore’s educational technology industry. The first two MoUs were signed in 1998 with Singapore Technologies Computers Systems and Services Pte Ltd (STCS) and Educom Pte Ltd (Educom). STCS worked with two schools to provide technology solutions, while EduCom, worked with four primary schools on an integrated learning management system called SuccessMaker. Educom also provided innovative computer furniture for the classrooms and training and support for the teachers. These two projects were co-funded by MOE, IDA (the then National Computer Board) and the respective industry partners, and cost about S$3.67 million, with the two industry partners contributing a little less than a third of the total fund.

e. Thailand: Non-governmental budget is relatively low, with support mostly provided in the form of technical assistance rather than in capital fund. The projects being funded by the private sector include “Think.com Programme” and “Intel Teach to the Future”. However, following the recent announcement of cooperation between Microsoft and the Thai Government, contributions to ICT education in Thailand may increase. Microsoft is committed to partner MOE and MICT in supporting 38,000 schools nationwide. The first stage focuses on the pilot project, “One District One Dream School”. The contribution includes learning grants, computer donations, and school agreements and will last for five years. Under this project, Microsoft will support and work closely with all institutions in the field of ICT in education to help improve teaching and learning in all schools.

In addition, there is the JICA-funded ITEd project aimed at developing effective curriculum using ICT and training 3000 teachers and local people who can implement the newly developed curriculum and tools in local model areas.
The preparation of guidelines will ensure that schools with adequate financial means can proceed on their own initiative, while complying with existing rules and regulations.

a. Malaysia: The Smart School Project uses a variety of funding strategies. The pilot project was implemented using federal funds, while the phased roll-out of the Smart School Integrated Solution will also make use of federal funds. However, it was originally planned that the schools would be empowered to become smart schools using their own funds and expertise. Guidelines to enable schools to proceed with “smartization” have been prepared and will be disseminated to all State Education Departments.
Integrating ICTs into Education