



DEPARTMENT OF EDUCATION

**Five-Year
Information and Communication
Technology for Education
Strategic Plan
(DepED ICT4E Strategic Plan)**

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Abbreviations

ALS	Alternative Learning System
BEC	Basic Education Curriculum
BESRA	Basic Education Sector Reform Agenda
CHED	Commission on Higher Education
DepED	Department of Education
EFA	Education for All
ICT	Information and Communication Technology
ICT4E	Information and Communication Technology for Education
ICTU	Information and Communication Technology Unit
ICT-TC	Information and Communication Technology Technical Committee
MDG	Millennium Development Goal
MTPDP	Medium Term Philippine Development Plan
SFI	Schools First Initiative
TEI	Teacher Education Institution
TEC	Teacher Education Council
UNESCO	United Nations Educational, Scientific and Cultural Organization

Foreword

Worldwide, Information and Communication Technology (ICT) is radically transforming the way we live. ICT is pervasive in our work, study and personal lives. Today's learners are growing up in a world characterized by technological change and innovation. Educators have recognized that there is a need to equip learners with the necessary skills and experiences that will enable them to become contributing members of the global community.

Research has shown that ICT has the power to increase motivation and learner engagement and helps to develop life-long learning skills. As a powerful educational tool, ICT can facilitate the transformation of school education. But to make this happen it is vital to bring about the changes to the mind set and culture among teachers, administrators, parents and students; the way in which the curriculum is designed and delivered and how students are currently assessed. Thus, harnessing ICT continues to be an important challenge to educators.

Since the 1990s, the Philippine Educational system has been grappling with this challenge. This DepED ICT4E Strategic Plan is the most recent of various efforts to transform basic education in the country. It has been developed collaboratively by education stakeholders from all areas of the Philippines. It recognizes that ICT provides schools and learners with exciting opportunities for learning and collaboration. It provides a description of knowledge, understanding, skills, capacities and values related to ICT that all learners in the Philippines should have. Its goal is to continue to help our students develop:

- abilities to seek, evaluate, organise and present information;
- higher order thinking skills;
- habits of life-long learning to fully participate in the information age; and,
- an understanding of the pervasive impact of ICT on their daily lives and the society.

The successful implementation of the DepED five-year ICT4E Strategic Plan will lead to the commencement of a new era in education. However, success will require close cooperation among the education stakeholders. This policy document will provide the direction needed to integrate ICT within the Philippine education system and help move the country forward.

Our Vision for ICT in Education

Following the overall vision of the Department of Education (DepED), our vision is “21st Century Education For All Filipinos, Anytime, Anywhere. This means an ICT-enabled education system that transforms students into dynamic life-long learners and values-centered, productive and responsible citizens.

ICT plays a major role in creating a new and improved model of teaching and learning where education happens anytime, anywhere. To achieve this vision, we will continue to use ICT to:

- revitalize our schools to make them into dynamic, collaborative and innovative learning institutions where students can become more motivated, inquisitive and creative learners.
- link up our students with the vast networked world of knowledge and information to enable them to acquire a broad knowledge base and a global outlook and provide them with the resources for the development of a creative mind;
- develop in our students skills and capabilities to critically and intelligently seek, absorb, analyse, manage and present information;
- create new knowledge and products; and
- develop in our students habits of self-learning to nurture the attitude and capability for lifelong learning.

In order to achieve our vision within the next five years, we aim to:

- completely integrate ICT into the curriculum, which includes the development of multimedia instructional materials, and ICT enabled assessment;
- intensify competency based professional development programs;
- establish the necessary ICT infrastructure and applications.
- develop processes and systems that ensure efficient, transparent and effective governance;

The key thrusts of this strategy are:

- Enhancing Curriculum
- Empowering Teachers, Administrators, Officials and Students
- Strengthening Schools, Governance and Management

The following chapters will detail each of the above thrusts.

Policy Context: Importance of the DepED ICT4E Strategic Plan

The experiences of other countries which are further down the path of ICT integration in education offer valuable insight and guidance in the development of this Strategic Plan.

ICT in Education – Global

A World Bank global survey of ICT in Education initiatives¹ revealed the following:

- It is generally believed that ICT can empower teachers and learners, promote change and foster the development of 21st century skills, but data to support these are still limited;
- ICT is very rarely seen as central to the overall learning process. Even in the most advanced schools in OECD countries, ICT is generally not considered central to the teaching and learning process;
- An enduring problem is that existing initiatives put technology before education. One of the difficulties of ICT use in education is that educational planners and technology advocates think of the ICT first and then investigate the educational applications of this technology only later;
- In general, the impact of ICT use on student achievement remains difficult to measure and open to much reasonable debate;
- Positive impact is more likely to occur when ICT use is linked to constructivist pedagogy;
- ICT is seen to be less effective when the goals for their use are not clear. The specific goals for ICT use in education are, in practice, often only very broadly or rather loosely defined.

ICT in Education – Asia-Pacific

Asia-Pacific countries have recognized the importance of ICT in education. They have responded to this challenge by formulating policies and developing strategies in different ways. A short summary of ICT initiatives in Asia-Pacific reveals that:

- Australia, South Korea and Singapore have almost all classrooms equipped with computers and other ICT tools, high student-to-computer ratio, high Internet connectivity, ICT-integrated curriculum and extensive online delivery.
- Thailand, Malaysia and India have formulated national ICT policies and master plans, but ICT is yet to be fully integrated and there is a lot of variation in ICT implementation across the education system.
- Lao PDR, Cambodia and Bangladesh have just begun efforts towards ICT integration and formulation of policies and are beginning to run pilot ICT projects.

The Philippines has been compared to many South-East Asian countries in recent years in terms of status of ICT within the education system. Many of our neighbours have introduced ICT Strategic Plan or Policy documents in recent years and many are further down the track of implementation and evaluation. For example, China introduced its first five-year ICT plan in 1996 and Singapore in 1997.

¹ Michael Trocano. *Knowledge Maps: ICT in Education* Washington, DC: WB, 2005. Available at: <http://www.infodev.org/en/Publication.8.html>

ICT in DepED: past and present

The Philippines supports the goals of major international movements like the Millennium Development Goals and Education For All. These provide a global policy environment for the directions of interventions towards improving educational outcomes. Translating these into national priorities, the Medium-term Philippine Development Plan 2004-2010 recognizes that the boundaries between school, home and work are quickly diminishing. This shows that unlike before, the role of ICT in education is no longer disputed. In line with this, the Basic Education Sector Agenda has outlined strategies in utilizing ICT for Pedagogy, Training and Governance within DepED. Also, the principle of School-based Management requires schools to be empowered and to have the necessary support structure in order to improve performance. Thus, ICT can play a major role not just in learning outcomes, but in system governance as well.

DepED has always been quick to recognize the potential of ICT in education. It introduced the use of radio broadcast in education in the 1960s and educational television in the 1970s. Through the support of Channel 4, the Tulong Aral program of the 1980s was the first major initiative that combined the use of radio and television in public basic education. There were also private sector initiatives in educational radio and TV since the early 1980s. Among them were children's television shows such as Kulit Bulilit and Batibot. Kulit Bulilit was a children's variety show and Batibot was patterned after Sesame Street which aired on Philippine television in the 1970s. However, these "edutainment" initiatives were not closely linked to the curriculum. Private-public partnership in educational television started in the 1990s with ABS-CBN Foundation's Sine'Skwela and Foundation to Upgrade Science Education's Continuing Studies through Television (FUSE-CONSTEL). Sine'Skwela is a curriculum based children's TV Program on Elementary Science. FUSE-CONSTEL is a teacher training program for high school teachers in English, Science and Math.

The milestone that ushered the age of computers in the public school system is the DepED Modernization Program (1996-2005). The main components of this program were the computerization project and the School of the Future project. This program introduced the use of information technology in the improvement of the teaching and learning process, educational management and operations. This program was also supported by other government agencies and the private sector.

Since then, the Philippine Government has shown serious commitment to ICT in education by implementing initiatives that apply ICT in teaching and learning. The various bureaus of the Department have already begun enhancing the curriculum, acquiring multimedia materials, training personnel, establishing ICT governance structures and procuring equipment, albeit in varying degrees. The most advanced in terms of ICT utilization is BSE, because they were the main focus of the modernization program. BALS, due to its small size, has been able to maximize donor support and has made the most progress in ICT utilization within the past five years. The large size of BEE, on the other hand, has been a challenge in delivering ICT-enhanced pedagogy to majority of public school students. Lastly, the recently formed Task Force on Technical and Vocational Education is just beginning to intensify ICT utilization, but its small size might allow it to achieve significant successes in less time.

However, more needs to be done in terms of ICT integration in DepED. Currently, it does not have a dedicated office that oversees and harmonizes all ICT initiatives. Also, it has not been able to ensure the ICT skills of all its existing and incoming teachers. It has only limited capacity to develop its own multimedia materials. Student-computer ratios and teacher-computer ratios in public schools are

slow to improve. The education system as a whole lacks infrastructure for networking and internet connectivity. These and other challenges hinder the performance of the entire Department. As a result, most administrative and pedagogical processes are still highly dependent on traditional technologies and inefficient paradigms.

Fortunately, more government funds are being channeled into ICT for education to address this situation. Private sector and foreign donors are increasing their support for this agenda. Big projects like the TEEP, SEDIP, BEAM, STRIVE and the CPC series have paved the way in intensifying the utilization of ICT in education. Some noteworthy initiatives include school-based information systems, curriculum support materials and teacher training. New resources made available by the BESRA and the Adopt-a-School program are also geared towards, among other thrusts, strengthening ICT utilization in the Department.

Given these past, current and planned initiatives, there is now a need to consolidate efforts and help to ensure that the Philippines will realize its ICT4E goals. DepED will lead and coordinate all ICT initiatives in basic education involving all agencies and stakeholders. This ICT4E plan will provide a threshold level of hardware for schools, training for teachers, curriculum standards, instructional materials and any necessary support in implementing ICT4E initiatives. Through this DepED ICT4E Strategic Plan, we will transform learners to be proficient, adaptable life-long learners with ICT playing a major role in creating a new and improved model of teaching and learning where education happens anytime, anywhere.

Moving Towards An Enhanced Curriculum

The overall curricular goals outlined in BEC remain valid. ICT is simply a tool to more effectively and efficiently achieve these goals. However, to be able to effectively use this tool, students, teachers, school managers and administrators should achieve a certain level of competence in the use of ICT.

ICT Learning targets for students have been identified in the following six areas:

- Basic operations and concepts
- Social, ethical and human issues
- ICT for Producing
- ICT for Communicating
- ICT for Researching
- ICT for Problem-solving

Students will acquire these skills, attributes and knowledge progressively across the formal years of schooling (Table 1). ICT will be embedded across the curriculum and will be perceived and used as a new approach to teaching and learning.

Competency standards for ALS learners and Technical-Vocational High School Students are in Tables 2 and 3 respectively.

Table 1: ICT Learning Targets for Students (K-2, 3-6, Y1-Y4)

Grades	Basic operations and concepts	Social, ethical and human issues	ICT for Producing	ICT for Communicating	ICT for Researching	ICT for Problem-solving
K – 2	Use basic devices successfully e.g. mouse, keyboard, VCR	Discuss basic issues related to responsible use of ICT.	Use basic ICT to produce materials to support learning.	Use ICT to communicate with others in support of learning and personal interests.	Use ICT to access new sources of information for learning.	Use ICT for problem-solving e.g. calculators, computers, learning packages
3 – 6	Use ICT devices efficiently and effectively	Understand and demonstrate ethical use of ICT and discuss consequences of misuse.	Use content specific tools, such as software and simulations to support learning.	Use ICT to collaborate with peers, teachers and others via collaborative tools to investigate learning-related topics or issues.	Select and use various sources of electronic information to complete learning tasks.	Select and use appropriate ICT for problem-solving
Y1 – Y4	Use ICT devices efficiently and effectively. Make informed choices regarding ICT and needs. Understand the advantages and disadvantages of different devices.	Demonstrate and advocate ethic and safe use of ICT among peers, family and local community.	Use ICT to develop, design and produce learning products.	Confidently and routinely communicate via ICT with peers, teacher and others to continue learning outside formal settings.	Select and use various sources of electronic information for research, problem solving and information analysis. Be able to apply criteria to determine credibility of information.	Select and use appropriate ICT for problem-solving, decision making and real-world problems.

Table 2: ICT Learning Targets for Technical-Vocational High School Students (ICT Subject/Specialization) *

Year Level	Basic Competencies (Covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements)		Common Competencies (Covers the knowledge, skills, attitudes and values needed to apply quality standards in the workplace. The unit also includes the application of relevant safety procedures and regulations, organisation procedures and customer requirements.)		Core Competencies (Defines the competency required to properly perform basic typing operations using a word processing application. This may include creating and formatting documents, creating tables, printing labels, and mail merge.)	
	1st year to 2nd year (PC Operations)	Obtain and convey workplace information Participate in workplace meetings and discussions	Complete relevant work related documents	Assess quality of received materials Assess their own work	Engage in quality improvement	Create documents Format document according to user requirements Change page appearance and layout
2nd year to 4th year (Computer Hardware Servicing)	Participate in workplace communication Work in a team environment	Practice career professionalism Practice occupational health and safety procedures	Apply quality standards Perform computer operations Perform mensuration and calculation	Prepare and interpret technical drawing Use hand tools Terminate and connect electrical wiring and electronic circuits	Install computer systems and networks Diagnose and troubleshoot computer systems	Configure computer systems and networks Maintain computer systems and networks

* Source: DepED Tech-Voc Education Competency-based curriculum (CBC) and TESDA Training Regulations and Standards

Table 3: ICT Learning Targets for ALS Learners

Level/ Learning Strand	Basic Operations & Concepts	LS 1	LS 2	LS 3	LS 4	LS 5
		Communication Skills	Problem Solving & Critical Thinking	Sustainable Use of Resources/ Productivity	Development of Self and Sense of Community	Expanding One’s World Vision
Basic	Use basic devices successfully e.g. mouse, keyboard, etc.	Use ICT to communicate with others in support of learning and personal interests	Use ICT for problem-solving e.g. calculators.	Use basic ICT skills to produce materials for livelihood purposes	Understand and demonstrate ethical use of ICT and discuss consequences of misuse	Discuss basic issues related to expanding one’s world view
A&E EL	Use modern ICT gadgets & devices efficiently and effectively e.g. digicam, videocam	Use ICT to team up with peers, MTs, and others via collaborative tools to investigate learning- related topics/issues	Select and use appropriate ICT for analyzing encountered problem	Use content specific tools, such as software and simulations to support personal and family needs	Use ICT to access new sources of information for development of oneself	Select and use various sources of ICT information to improve relationship with others
A&E SL	Make good choices regarding needs for ICT information. Identify the advantages/disadvantages of different devices	Communicate confidently via ICT with peers, MTs, Instructional managers, and others and continue learning informally after sessions	Select and use appropriate ICT for problem-solving, decision making and real-world problems	Use ICT to develop, design and produce local/ community-based products	Demonstrate and advocate ethic and safe use of ICT among peers, family and local community	Select and use various sources of ICT information for research, information, and analysis for adopting oneself to other people’s life and environment

The ICT-enabled Curriculum

The use of ICT in teaching and learning must be accompanied by a corresponding enhancement of the school curriculum. This ICT4E Strategic Plan envisages that curriculum reform will proceed in two stages. In the initial stage, ICT will be integrated within the existing curriculum. The second stage will see the full integration of ICT in the enriched curriculum. Details of these two stages are summarized below.

Stage 1: Enhancing ICT use in the existing curriculum

This will involve:

- reviewing the existing curricula and content with a view to suggesting common teaching and learning strategies using ICT;
- identifying ICT resources (e.g. relevant web-sites or courseware) that can serve the general purpose and specific elements of teaching and learning in subjects, cross-curricular areas and integrated studies;
- encouraging school-based efforts to adapt ICT to different learning areas, subjects, interests and abilities of students, and stakeholder expectations;
- encouraging schools to use ICT to make internal assessment less labour intensive; and
- conducting research on the impact of ICT on student learning from the experience of the more pioneering schools to facilitate informed decisions regarding the curriculum and assessment modes.

Stage 2: Full integration of ICT in the enriched curriculum

DepED will conduct a comprehensive review of the school curriculum to cater for new developments. ICT will become a core competency for students, and paradigm changes arising from the use of ICT will be comprehensively integrated into the new school curriculum. It is proposed that future technology-related subjects should adopt a more open approach to its curriculum format so that updated elements could be accommodated readily without a major revision.

This may involve but is not limited to:

- developing a learner-centered, life-skills oriented curriculum
- creating more opportunities for collaborative learning activities
- mainstreaming of ICT integration models validated and proven effective during Stage 1
- deploying new delivery systems that support paradigm changes in the curriculum

Since the implementation of BEC in 2002, review of existing curriculum is ongoing and ICT integration into the curriculum has started. ICT integration is happening at the delivery mode and ICT is taught in elementary at secondary as a separate subject on computer education. The school-based management system will be used to help schools adapt to the enhanced ICT-based teaching and learning styles.

It is seen that Stage 1 will be completed within 3 years of this plan's implementation. Stage 2 will start on year 4 with a review of the curriculum content in light of the radical changes brought about by ICT in society, economy and politics.

Pre Elementary & Elementary Schools

Pre Elementary

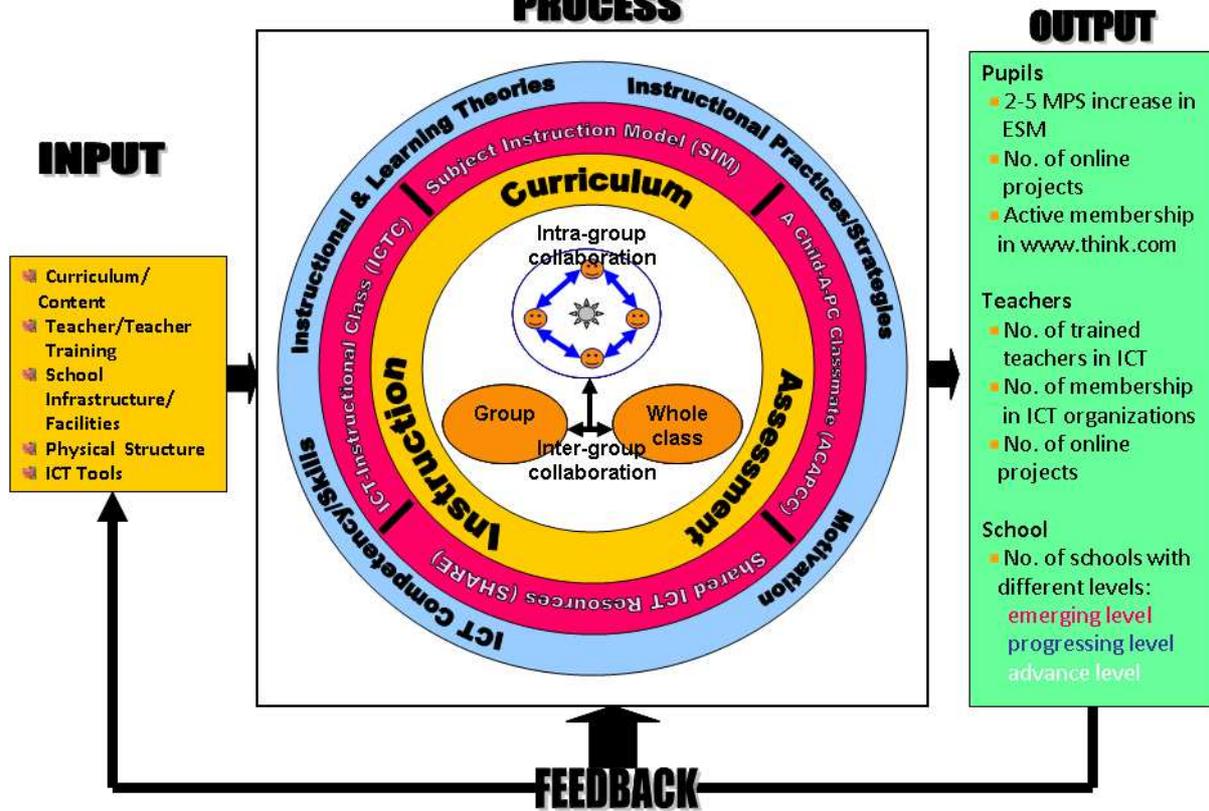
Pre elementary education is not part of the formal basic educational ladder. However, Republic Act 232 defines elementary education to include pre-elementary. The Department, however, recognizes the importance of sound early childhood development. It has exercised steps to integrate preschool education in the basic education system. Competencies for five-year old Filipino children have been developed through an interagency initiative spearheaded by the Department of Education and the Department of Social Welfare and Development. The competencies focus on the development of gross and fine motor facilities, the ability to understand and express thoughts and feelings through language and the formation of concepts, sensory discrimination, reading and number readiness. An ICT-enhanced preschool curriculum shall provide for opportunities for children to further advance their physical and mental development through early exposure and awareness of technology. Computers shall be used in play activities. Likewise, children who manifest high aptitude and giftedness shall be further stimulated through multimedia technology and computers. Reading and numeracy readiness shall be developed using interactive voice-over books and electronic calculators and the like.

Elementary

The ICT-enhanced curriculum in elementary schools is envisioned to provide for the development of the 21st century skills among 6-11 year old children. These skills enable all types of learners to utilize available and appropriate ICT equipment/ facilities to address their daily life situations. Specifically, the ICT curriculum in the elementary level focuses on the integration of the use of ICT appropriately in the development of skills in all learning areas. Through ICT, the learners will be able to acquire new skills and concepts in the different learning areas. Likewise, thru the ICT-enhanced curriculum, the skills of the learners in thinking critically, communicating, researching, problem solving, producing and creating outputs in relation to their lessons are enhanced. A design framework shall be developed to guide actual classroom implementation of the ICT-enhanced curriculum.

The goal of the ICT-enhanced curriculum is concretized thru the ICT-based instructional model proposed by the Bureau of Elementary Education (BEE) which is presented in the framework found below.

ICT-BASED INSTRUCTIONAL MODEL PROCESS



The teaching-learning process in an ICT-enhanced curriculum shall adhere to the tenets of the Basic Elementary Competencies (BEC)-elementary level. It shall provide for activities that call for hands-on and minds-on learning, interactive learning, value-laden, integrative learning and application of learning in real situations.

In an ICT-enhanced classroom, learning may take place with the whole class, in small groups or individually. In a whole class set-up, teaching is facilitated with the use of inactive whiteboard, television, LCD equipment, PC and multimedia materials. Learners may have the opportunity to experience learning through Internet and stand alone multimedia materials. In a small group set-up, learning takes place through collaboration/ cooperation with the use of PC and other ICT equipment. The ICT media promote interaction among learners, between learners and teachers, and between learners and instructional materials. The vision of ICT learning in elementary schools is to enable the learners to individually engage in activities utilizing ICT tools for learning through a one-on-one learner-PC model.

Secondary Schools

General High Schools and Other Types

The Bureau of Secondary Education's (BSE) redefined Secondary Education Curriculum (SEC) highlights the core skills for the 21st century. These core skills shall be implemented in the special programs in select secondary schools across the nation. The design focuses on the results/outcomes

as indicators of the disciplines contributory to the attainment of the overall goal of functional literacy, particularly in the following domains relative to the application of ICT.

- Communication skills
 - Ability to clearly express one’s ideas and feelings orally and non-verbally
 - Ability to access, process and utilize available basic and multimedia information
- Critical Problem Solving
 - Innovativeness and creativity
 - Future orientation
- Sustainable Use of Resources/Productivity
 - Sustainable use of resources (including time) and appropriate technology

The redefined SEC specifies what the students are expected to know and be able to do and the levels of proficiency that they are expected to demonstrate in regard to the use of ICT. These are embedded under the content/performance standards. To ensure that standards will be captured, essential understandings are identified and translated into essential questions.

ICT Learning Standards for Students (Table 5) defines the level of ICT application which is embedded in the refined SEC.

Table 4: ICT Learning Standards

Year	Basic Operation And Concepts	Social, ethical and Human issues	ICT for Producing	ICT for Communicating	ICT for Researching	ICT for Problem Solving
I	Use basic devices	Discuss and observe basic issues related to the responsible use of ICT	Use basic ICT procedures to produce materials to support learning	Communicate knowledge by exchanging e-mail messages with others	Identify various and appropriate sources of information	Use ICT for successful problem solving
II	Use appropriate ICT devices efficiently and effectively	Interpret and observe ethical and legal considerations in utilizing ICT	Use appropriate content tools such as software and simulations to support learning	Exchange information and ideas for identified purposes through e-mail	Use ICT to access appropriate sources of information for learning	Select and use appropriate ICT for problem solving efficiently and effectively
III	Use ICT devices for identified purposes successfully	Understand and demonstrate ethical use of ICT Discuss consequences of misuse of ICT	Use ICT to develop and produce learning products	Exchange ideas with others through online forums and websites	Select and use various sources of electronic information to complete learning tasks	Select and use appropriate ICT for problem-solving and decision-making on real word problems
IV	Recognize and demonstrate skills in operating technological systems efficiently and effectively Make informed choices regarding ICT and needs Understand the advantages and disadvantages of different devices	Demonstrate and advocate ethic and safe use of ICT among peers, family and local community	Use ICT to enhance learning, increase productivity and promote creativity	Use ICT to collaborate, publish and interact with peers, experts and other audiences	Select and use various sources of electronic information for research, problem solving and information analysis. Apply criteria to determine integrity and accurateness of information	Understand the purpose and demonstrate the use of the design process in problem solving Use ICT in developing new understanding and thinking

Technical-Vocational High Schools

ICT is being used in Technical-Vocational High School (TechVoc HS) to:

- provide TechVoc HS students with 21st century skills;
- prepare the students for local and international certification in ICT and other technical fields;
- expose the students to industry ICT standards
- prepare the students for employment and/or entrepreneurial activity should they decide not to continue higher learning (i.e. IT technician, IT programmer, and other related ICT

A subject on the use of the computer and basic productivity software (PC Operations) is mandatory for all TechVoc HS students. "PC Hardware Servicing" is offered as one of the specializations in TechVoc HS in the Arts and Trades category.

To respond to the rapidly growing need for skilled ICT workers, the establishment of ICT TechVoc HS is deemed necessary.² This ICT TechVoc HS will offer wide range of ICT specializations which include Networking, Database Management, Programming, Multimedia Arts, Digital Music, etc. By June 2010 16 Regional ICT TVHS will be opened.

In all TechVoc HS, ICT shall be used to enhance learning in tech-voc specializations (ie Arts and Trades, Agriculture and Fishery) as well as related/academic subjects (ie English, Science and Math).

Emergent ICT skills requirements for Arts and Trades, Agriculture, and Fishery will be studied and new subjects to develop such skills will be develop and implemented.

ALS Curriculum

The Alternative Learning System (ALS) aims to develop functionally literate ALS learners through acquiring necessary basic life-skills that can be used in their daily lives.

The ALS Curriculum will be enhanced towards becoming an ICT-enhanced ALS Curriculum through the following:

- Inclusion of life skills strategies in identified points within the curriculum;
- Integration of activities within the A&E session guides where ICT can be utilized through the use of website links and existing ICT learning materials; and
- Use of other supplementary/multi-media learning materials appropriate for use of ALS learners; and
- Review and evaluation of core competencies versus the number of core module.

² At present, Technical-Vocational High Schools (TechVoc HS) have three categories (1) Arts and Trades, (2) Agriculture and (3) Fishery Schools. The ICT TechVoc HS will be a fourth category

Multimedia Instructional Materials Development

Already, various independent initiatives within DepED have developed customized teaching and learning digital content tied to the curriculum. These materials are being collated and are available for use by teachers through the DepED website. However, access to existing digital content remains limited and creating a comprehensive inventory of these materials continues to be a challenge.

In anticipation of the more widespread use of Multimedia Instructional Materials (MIM), a sector-wide Digital Content Development and Usability Framework has been drafted.

In the course of this plan's implementation, DepED will intensify the development and acquisition of MIM as supplement to, not as a replacement of, existing (printed) instructional materials.

In the first year of this plan's implementation, DepED would undertake the following:

- Adopt the aforementioned Digital Content Development and Usability Framework. From then on it would serve as a guide in the development, adaption, adoption and/or acquisition of MIM.
- Develop and adopt an IPR Framework and Guidance on MIM based on open content principles to facilitate the sharing of existing digital content – be they be those in the public domain, those that were donated to DepED, or those developed by its teachers -- on a national level.
- Provide incentives to encourage the development of regional/local content by teachers and other education personnel and officials.
- Establish procurement guidelines for commercially developed MIM. The copyright of commercial MIM shall be procured under existing rules and regulations. Schools may independently source MIM only for "special and local needs"

Elementary Schools

In the next three years, elementary schools shall utilize existing multimedia instructional materials which were reviewed by the schools and at the central office for suitability and appropriateness to the learners and learning competencies.

Schools shall be empowered to develop multimedia instructional materials based on their needs. Likewise, incentives shall be provided to encourage teachers to develop and utilize their own multimedia resources. Multimedia instructional materials developed by schools shall be shared with other elementary teachers through the Internet.

Secondary Schools

General High Schools and Other Types

In the first year of this plan's implementation, DepED, through the Bureau of Secondary Education (BSE), will further define the learning activities that HS students will undertake to attain the standards that they will need to succeed in the 21st century.

Learning activities would be aligned with the standards and would be designed to promote attainment of desired results. These activities would address one or more specific standards. They would involve significant content and processes from the standards and should lead to products and performances that can be used to assess student learning. They would promote active learning and should include the application of ICT, where appropriate.

DepED, through BSE, would spearhead the identification and development of digital multimedia instructional materials, and the facilities that students need to carry out the activities and attain the standards. These MIM would be utilized for the enhancement of the teaching-learning process in English, Science and Mathematics following the implementation of the 2010 refined SEC.

Tech-Voc High Schools

For the effective implementation of ICT curriculum for technical-vocational high schools, the following shall be developed:

- Teachers guide for all specializations

These multimedia materials will guide the teachers in each specialization (ie Arts and Trade, Agriculture and Fishery) to effectively implement the curriculum requirement following the required ICT standards. Basically these materials will have curriculum content, strategies and assessment

- Student module

Interactive, Web-based, Computer-Aided and other digital instruction materials will be developed to help students internalize the utilization and application of ICT. Eventually, instructional materials simulating hands-on experience will also be developed.

- Training modules for Teachers and Administrators

These materials will guide the trainers in the conduct of training, emphasizing the content, strategies, monitoring and evaluation.

Alternative Learning Systems

In 2006, the Bureau of Alternative Learning System (BALS,) in partnership with the Commission on Information and Communication Technology (CICT) engaged in a project called eSkwela to deliver secondary level alternative learning to out-of-school youth and adults through the use of interactive electronic-modules (e-modules).

Utilizing the existing secondary core modules of the ALS Accreditation and Equivalency (A&E), the eSkwela project has developed almost 150 A&E e-modules that are being used in four (4) pilot project sites. An additional 120 A&E e-modules are being developed. BALS will continue the project through the following activities:

- Reproduction, distribution and utilization of existing 35 e-modules in Region, Division and existing CLCs;
- Development of 69 basic literacy (levels 2&3) modules, 30 informal education modules, and 15 ALIVE e-modules; and
- Utilization of basic literacy, informal, and ALIVE e-modules in ICT-ready CeLCs.

ICT-enabled Assessment

DepED through BESRA is developing an Assessment Framework which requires a re-conceptualization of the national assessment system of the Department. This framework entails a range of actions that include development of assessment standards, tests and other instruments, conduct of training and advocacy programs and the formalization of assessment roles and responsibilities. Dovetailing with this major initiative, ICT will have the dual role of being one of the areas to be assessed and enabling the efficient and effective implementation of the assessment program.

The goals and outcomes of this plan are well articulated and will serve as the basis for the indicators in the actual instruments that will assess ICT integration and competencies. But more importantly, a sound approach in the use of ICT in assessment will open up new possibilities in the menu of available assessment methods. ICT can greatly improve assessment planning, collecting and analyzing of data and recording and reporting of findings. The main goal would be to lessen the reliance on traditional pen-and-paper tests and conduct a multi-dimensional portfolio assessment of the learner.

Pre-Elementary and Elementary Schools

Pre Elementary

Assessment in preschools is conducted through informal observations of the desired behaviors among children. Technology is envisioned to stimulate inquisitiveness, curiosity and latent creativity among children, the manifestation of which are measured through their involvement in play activities and responses in interactive multimedia games. A significant success indicator that shall be measured formally is the readiness of children vis-à-vis their developmental milestones (physical, social, mental, emotional) through the School Readiness Assessment Test (SReA).

All preschool aged children in public elementary schools shall be made ready to cope with the expectations of grade 1. Preschool teachers of the department shall be capacitated to record, interpret and provide feedback on the results of the SReA utilizing different media technologies.

Elementary

ICT-enabled assessment in elementary schools comprises the evaluation tools which utilize available ICT interactive assessment of the performance of the learners. Teachers evaluate the learners using available and appropriate ICT-enhanced assessment tools. Likewise, teachers shall be able to record and give immediate feedback on the performance of the learners using the different ICT media forms. Schools shall be encouraged to establish item banks in all learning areas. The ICT-based item banks may be utilized either for summative, formative or for practice exercises.

By 2010, all ICT-enabled schools shall have progressively increased their mean percentage scores in achievement tests by at least 5% in all learning areas particularly English, Science and Mathematics. 90% of the teachers shall have advanced from basic and proficient competencies to advanced level through continuous competency-based INSET.

Secondary Schools

General High Schools and Other Types

The refined SEC defines the acceptable evidence of student's attainment of desired results. It determines authentic performance tasks that the student is expected to do to demonstrate the desired understandings. Likewise, it defines the criteria, including the application of ICT, where appropriate, against which the student's performances or products shall be judged. These products and performances indicate how students are expected to present evidence of their learning or demonstrate conceptual understanding, and content and skill acquisition. The products and performances should promote self-understanding, self-monitoring, and self-assessment. They should include opportunities for authentic audiences to experience and critique results. Likewise, they should permit choices and combinations of oral, written, visual, and kinesthetic modes and the application of ICT, where appropriate

The use of ICT-enabled assessment in General HS shall commence by 2010 during the institutionalization of the refined SEC. Prior to this, available ICT-enabled assessment tools may be used while teachers are provided with the required capacity building to promote the development of ICT-enabled assessment tools.

Tech-Voc High Schools

By 2010, all TechVoc HS shall utilize ICT-enabled assessment. In the first year of this plan's implementation the following will be undertaken:

- Development of monitoring/survey tools which will serve as basis for the assessment of student learning
- Definition of the criteria on how to assess learning of the students in the utilization of ICT
- Formulation of recommendation to respond to the needs as per result of the assessment

Alternative Learning Systems

Assessing learners to tracking learning progress will be the main responsibility of CeLC managers. To accomplish this, they would:

- Maintain a learning management system (LMS) that will hold records and results of assessment activities in every session. This LMS will give the center managers the chance to keep track of the skills/competencies gained versus the finished e-modules and how his learners advances;
- Develop portfolios of learners that will keep physical outputs and records. This will also serve as one of the bases in determining the progress and readiness of ALS learners to take the A&E Test.³

³ The A&E Test is usually given to ALS learners after a period of 10 months learning intervention. If they passed this test, they will be recognized as graduates and will be given a certificate which is comparable to the diploma given to regular formal elementary or secondary graduates.

By 2010, on-line A&E testing shall also be conducted.

Competency Standards and Professional Development

In order to realize this ICT4E masterplan, ICT competency standards for teachers, education managers, school officials and non-teaching personnel/administrative staff shall be developed and adopted. A Competency Standards “is a document that specifies in a structured format how people should perform a job or work role. Organisations use competency standards. ... Competency standards attempt to capture the various dimensions that, when taken together, account for 'competent' performance.”⁴

Teachers

Teachers need to embrace the changes ICT will effect on teaching and learning. The teachers’ role will shift from the traditional provider of knowledge to the facilitator of learning. In order to make these changes more easily, they should become habitual users of ICT. They should continue to look for opportunities to upgrade their competencies, share their experiences and create a culture of collaboration in order to support each other.

Towards this goal, the DepED ICT Competency Standard for Teachers which has been developed will be adopted during the first year of this plan’s implementation. This standard has three levels (Basic, Proficient and Advanced) in 6 domains (ICT; Pedagogy; Organization and Administration; Teacher Professional Development; Social, Ethical Legal and Human Issues; and, Evaluation and Assessment). (Table 5). It is based on existing national (NICS Teachers) and international (UNESCO, etc) standards.

DepED will further refine the different levels of ICT competency of its ICT Competency Standard, and develop the corresponding assessment tools within the first year of this plan’s implementation .

Teachers will be required to work towards the attainment of the DepED ICT Competency Standard. To assist them, a comprehensive professional development program for teachers will be developed. This program will be built on existing in service training initiatives.

DepED will also revise its hiring requirements such that all new hires by the third year of this plan’s implementation would have achieved the basic level of competency based on the DepED ICT Competency Standard. To achieve this goal it will be recommended to the CHED that TEIs should align their courses to the said DepED ICT competency standard. Thus, collaboration between TEIs, the Commission on Higher Education (CHED), PRC and DepED will be essential.

Schools will be responsible for the progressive attainment of these competencies by their teachers as part of their annual performance appraisal. DepED will conduct a yearly assessment of the effectiveness of the comprehensive in-service training program and compliance of this directive beginning the third year of this plan’s implementation

Education Managers

DepED will adopt National ICT Competency Standards for Career Executive Service Officials, which was jointly developed by the CICT and the CESB, as the Competency Standards for its Education Managers.

⁴ <http://www.ambulancedriving.com/standard/whatcomstan.html>

School Administrators

The increasing autonomy for administrators will give schools the flexibility to adapt to the new teaching and learning styles needed to effectively integrate ICT. However, this increase in decision-making capabilities is accompanied by the commensurate increase in responsibilities. School administrators will be expected to lead in fulfilling our shared vision for comprehensive ICT integration and fostering an environment and culture conducive to the realization of this ICT4E plan. To do this, they will have to increase their understanding of how ICT can support learning, enable staff to explore innovative practices integrating ICT, and have the confidence and capability to lead and manage the change required to maximize the benefits of these technologies.

Within the first year of this plan's implementation, DepED will develop and adopt an ICT Competency Standards for School Administrators based on international standards such as ISTE/NETS that would serve as a basis for a comprehensive capability building program for School Administrators.

Non-Teaching Personnel/Administrative Personnel

DepED will adopt an industry-based ICT Competency Standards relevant to its Non-Teacher Personnel/Administrative staff.

In recognition of the need for Chief Technology Officers (CTO) in all Schools, a preliminary version of the ICT Competency Standards for School CTOs has been formulated. This standard is based on the global standard for School CTOs. This standard will be finalized and adopted during the first year of this plan's implementation.

Table 5: ICT Competency Levels for Teachers

Competency Levels	ICT	Pedagogy	Organization & Administration	Teacher Professional Development	Social, Ethical, Legal, and Human Issues	Assessment and Evaluation
<p>Basic A teacher needs to be aware of the uses of ICT for teaching and learning</p>	<p>Have basic knowledge of hardware and software, web browsers, and other multimedia devices.</p>	<p>Use technology for classroom activities and presentations.</p> <p>Select ,use and develop appropriate instructional materials using various online and off line sources</p>	<p>Use technology with the whole class, small groups, and individual activities and assure equitable access.</p>	<p>Acquire technological skills for professional development.</p> <p>Use tools and applications to: -develop instructional materials, -communicate with students, parents, teachers, administrators, and others.</p>	<p>Understand and demonstrate the social, ethical, legal and human issues surrounding the use of technology</p>	<p>Use ICT to set learning targets, collect data for assessment and evaluation</p> <p>Monitor, evaluate and control students’ use of technology for educational and recreational purposes</p>
<p>Proficient A teacher will be expected to be a more fluent, critical and reflective user and must be able to demonstrate appropriate and efficient use of ICT beyond basic forms.</p>	<p>Monitor, evaluate and facilitate students’ use of tools and applications to collaborate, access information, and communicate to analyze and solve problems.</p>	<p>Make use of networks, collaborate, create and manage complex projects</p> <p>Demonstrate continual growth in technology knowledge and skills to stay abreast of current and emerging technologies</p>	<p>Facilitate equitable access to technology resources for all students</p> <p>Plan, promote and model safe and healthy use of technology resources</p>	<p>Use computers and other technologies to: -effectively and appropriately to communicate information in a variety of formats -develop performance tasks that require students to locate and analyze information -use a variety of media to communicate clearly.</p>	<p>Facilitate equitable access to technology resources for all students</p> <p>Plan, promote and model safe and healthy use of technology resources</p>	<p>Apply technology to facilitate a variety of appropriate assessment and evaluation strategies to recognize diversity of learners, and use results to refine design of learning activities</p>

Competency Levels	ICT	Pedagogy	Organization & Administration	Teacher Professional Development	Social, Ethical, Legal, and Human Issues	Assessment and Evaluation
<p>Advanced A teacher will be able to further explore the range of possibilities for use of ICT across the curriculum and design student learning activities that integrate ICT tools that take into account students' different learning styles. This includes adopting emerging technologies.</p>	<p>Model ICT learning processes, where students: -apply their cognitive skills, -need special attention; -fall below average, -need tutorial, -remediation, -gifted that need special organization and advanced lessons</p>	<p>Model and continuously learn and use ICT to create applications and software and professional knowledge communities.</p>	<p>Facilitate students' use of technology that addresses their social needs and cultural identity</p>	<p>Model self-directed attitude towards new content, applications and software. Experiment and continuously learn, use and experiment ICT to create instructional year materials and models.</p>	<p>Facilitate students' use of technology that addresses their social needs and cultural identity</p>	<p>Use computers and other technologies to effectively communicate and collect information on student learning using a variety of methods for assessment and evaluation.</p>

Professional Development

A comprehensive training program for Teachers, Education Managers, School Administrators and Administrative staff will be developed and implemented by the first quarter of 2009. DepED will work with other government agencies (CHED, TESDA, CICT) and private sector partners such as Intel, Microsoft, Oracle, Cisco, etc. in the program's development and implementation,

Teachers

Only teachers who are confident and capable users of ICT can equip students to meet the ICT challenge. These teachers will need support to make the transition to a new, more collaborative approach to teaching and learning. As facilitators of learning they will need to develop their pedagogy to be more interactive, dynamic and adaptable.

Teachers will be provided with professional development in order to attain capability in the DepED ICT Competency Standards for Teachers.

Elementary Schools

Capability building for elementary teachers will center on developing and enhancing the teachers' skills in ICT and in using ICT media to enrich teaching. This will come in the form of training in different modalities (distance and face-to-face). Different types of training shall be utilized including mentoring, coaching and peer tutoring. Teachers shall be profiled in terms of basic, proficient and advance levels according to the DepED ICT competency standard for teachers.

Based on existing and proposed budgets for teacher training, it is anticipated that at least 30,000 Elementary school teachers will be capacitated in the development of ICT-enhanced lessons by 2010.

Secondary Schools

General High Schools and Other Types

At the secondary level, the capability building of teachers will be based on the approved ICT teaching standards of the Department which include

- identification of topics across the learning areas where ICT will be integrated;
- development of appropriate ICT-based instructional materials to support full integration
- training on the use of ICT-based instructional materials to enhance creativity in the teaching-learning process.

Effort in building up the capacity of teachers is aimed at providing a personalized approach to developing the student's multiple intelligences.

Based on existing and anticipated budget by 2010, all first year HS teachers across all learning areas shall have been trained on the integration of ICT.

Tech-Voc High Schools

Capacity Building for TechVoc HS Teachers includes:

- Training on the effective curriculum implementation, strategies and assessment
- Training on the utilization of ICT multimedia instructional materials
- Training on use and maintenance of laboratory equipment and facilities
- Training on the development of other multimedia instructional support

The following in-service ICT trainings are also deemed necessary:

- Content delivery
- Skills enhancement training for all teachers of tech-voc high schools
- Assessment of learning
- Using the Internet for Research

By 2010, all 1st and 2nd Year Tech Voc HS teachers (in all areas in four categories) will be trained in ICT for education.

Alternative Learning Systems

The following will be conducted for ALS facilitators, particularly the Mobile Teachers (MTs), District ALS Coordinators (DALSCs) and BPOSA Instructional Managers (IMs):

- ICT training on basic, proficiency and advanced levels will be given to them in order to equipped them on the” know-how” to maximize the utilization of available, most appropriate educational teaching-learning approaches and strategies through the web;
- Training on the utilization and management of the learning management system (LMS) that goes with the use of assessment tools; and
- Training on new approaches to facilitation of learning through the use of
- non-threatening language or communication
- more interesting session activities, and
- effective encouraging techniques that will greatly improve the way they handle sessions with their learners.

Training on the effective implementation of the programs and projects through ICT shall also be conducted. This would include:

- Training on the maintenance and management of BALS website linked to the DepED website; and
- Training on utilization of M&E Instrument for ALS Standards.

By 2010, all mobile teachers, district coordinators and IMs will be trained in the use of ICT in Alternative Learning.

School Administrators

Professional development will be provided to school administrators on the different dimensions of ICT integration, which includes developing a school ICT policy and strategy. The professional development will provide a structure and mechanism that will encourage and support schools in establishing their own vision, goals and strategies which are consistent with this ICT4E Strategic Plan. This professional development should be designed so that school administrators are able to lead in:

- developing a plan to progressively implement ICT. This should include areas such as the use of ICT in different subjects, in administration, assessment, preparation of materials and associated school activities;
- adhering to DepED's ICT standards for hardware, software, ICT learning resources and training;
- ensuring that teachers become innovators and agents of change; and
- developing tools for teacher feedback so that a culture of constant re-evaluation and continuous improvement is created.

DepED will develop and implement the necessary training modules that will fully elaborate the focus areas listed above, which includes a dedicated ICT leadership training for school administrators. DepED will also aim to establish structures such as online communities and recurring programs to support school administrator's ICT training and sustain the momentum of such training. This training program will build on the ReimaginED series launched in 2007.

A specific budget for school administrators training will be established. As a result, it is expected that by 2010, all school administrators would have been trained in ICT for school administration.

Administrative/Non-Teaching Personnel

In the first year of this plan's implementation, a comprehensive training plan to help Administrative/Non-Teaching Staff achieve the relevant ICT competency standard shall be developed and implemented.

Enterprise Architecture

In the first year of its implementation, DepED will design and implement an Enterprise Architecture (EA) to guide the development of interoperable ICT systems in the Department.⁵ This EA would define the various hardware and systems for pedagogy and professional development as well as governance and management.

The following principles of shall guide the design and will be promoted by the DepED EA:

- Interoperable – allowing, through Open Standards, the exchange, reuse, interchangeability and interpretation of data
- User-centric - prioritizing services fulfilling user requirements over perceived hardware or software constraints
- Sustainable – maintaining balance and resiliency while addressing organizational, technical, financial and legal issues in a manner that allows an ecosystem to thrive and evolve.
- Flexible – adapting seamlessly and quickly to new information, technologies, protocols and relationships while integrating them as warranted into market-making and government processes.
- Collaborative – allowing other government agency, industry partners, parents, teachers, and other stakeholders to create, grow and form communities of interested parties that can leverage strengths, solve common problems, innovate and build upon existing efforts.⁶

EA – Administration and Management

The DepED EA would help achieve efficiency and effectiveness in operations. Through it, the DepED will establish an integrated service network that ensures efficient, transparent and effective governance and management. This relies on timely access to information, knowledge and funding. The EA would prescribe systems that would minimize the burden of data collection and reporting from key school personnel to allow them to focus on their critical tasks in pedagogy.

Among the systems that will be developed, in the order of priority, are:

- School-based Information Management System (includes raw data on enrollment, assets, no of teachers, etc)
- Enterprise Learning Management System,
- Human Resource Information System – that interfaces w/ GSIS, PhilHealth, BIR, DBM, banks, etc),
- Resources Management System
- Performance Management System
- Globalized Service Support

⁵ Enterprise architecture is an Department-wide framework for incorporating “business” processes, information flows, applications, and infrastructure to support agency goals. (Adapted from <http://www.whitehouse.gov/omb/budget/fy2003/bud35.html>)

⁶ <http://cyber.law.harvard.edu/epolicy/roadmap.pdf>

- Executive Information System (enhanced BEIS) with Geographical Information System (GIS)

Within the first year of this plan's implementation, the DepED would design and adopt a comprehensive service delivery framework for administration/management, including ICT equipment for administrative use in schools.

In the course of this plan's implementation, the current DepED data center will be transformed into the DepED data and digital content center.

EA – Pedagogy

In terms of pedagogy, the EA will allow the deployment of new modes of delivery envisioned by this ICT4E strategic plan. It shall pave the way for more collaborative and learner-centered pedagogy. The EA will help fulfill the goal of providing anytime, anywhere 21st century education for all.

It is envisaged that this ICT4E Strategic Plan will bring all schools and teachers to certain threshold levels of ICT provision and skills. This will directly aid our students in acquiring 21st century skills.

During the five-year period, the Department will provide the following to public schools and would serve as the minimum requirement for private schools:

Elementary Schools

The realization of the ICT-enhanced teaching and learning process shall be facilitated through a classroom enriched with various ICT instructional equipment. The provision of the equipment shall be based on a classroom instructional model that allows the teacher to use the different ICT media to enhance daily lessons in all subject areas.

By 2010, at least 50% of all "complete" elementary schools shall be provided the basic ICT package to enable them to achieve at least an annual increase 5% in their achievement level. The package for each school consists of 1 computer for the teacher, an interactive whiteboard, digital camera, a 32" colored television, a DVD an LCD and wireless microphone and PA system. As the schools progressively perform, ICT packages which include additional computers shall be provided.

Secondary Schools

General High Schools and Other Types

By the end of this plan, each public high school will have access to two learning stations (1 for ICT skills development and 1 for ICT integration in subject matter areas);

Each ICT skills development station would include 10+1 PCs with multi-user terminals

Each ICT integration learning station would include TV set, LCD projector with document camera, microphone, interactive board and video lessons

All school computers (including library, administrative offices and faculty rooms) will be connected to a school Intranet and all public high schools will have access to the Internet. Furthermore, all schools will be provided with curriculum and technical support.

Tech-Voc High Schools

All Tech-Voc HS will have computer lab, an ICT workshop and multimedia classroom. There will be 1:1 computer to student ratio. All TechVoc school computers (including library, administrative offices and faculty rooms) will be connected to a school Intranet and all Tech Voc HS will have access to the Internet. For Regional TechVoc ICT HS, student will be provided with mobile computing devices (Laptops, notebooks, netbooks) all schools. All 261 Tech-Voc high schools including the Regional ICT TVHS will be provided with curriculum multimedia materials and technical support

Community Learning Centers

All community learning centers will be equipped with a television, a DVD player, computers. Absent a physical CLC, mobile teachers will have laptops with wireless internet connection and a projector. All community learning centers will have access to the Internet and all community learning centers will be provided with curriculum and technical support.

The DepED EA shall also facilitate the creation of a distance-mode in-service training program. While there is no doubt that training programs are most effective when conducted face-to-face and over an extended period of time, distance mode training is called for in view of the perennial resource constraints of DepED and the need to fast track capability building.

Governance

ICT Governance means “specifying the decision rights and accountability framework to encourage desirable behavior in the use of ICT”. ICT Governance determines who makes the final decisions on ICT in DepED. It is distinct from ICT “management” which is the process of making and implementing final decisions on ICT.

The DepED will adopt an ICT Governance Framework in order to: 1) properly evaluate the ICT in the context of the Department’s needs and challenges; 2) set the direction of proposed ICT plans and policies; and 3) the monitor the performance of plans and conformance with policies.⁷ DepED ICT governance comprises the following:

- stakeholder engagement and representation
- strategic planning for information and technology investment, procurement and deployment
- policy development and agreement
- high level monitoring of program delivery
- ‘business as usual’ performance monitoring
- standards selection and implementation
- risk management
- policing policy, standards, conformance with legislation, and proper use⁸

The DepED ICT governance framework will be comprised of 1) a set of principles, 2) decision-making hierarchy and 3) tailor-made suite of reporting and monitoring processes.⁹

DepED has taken an initial step in setting up an ICT governance framework in DepEd Order 1 s 2007. Within the first year of this plan’s implementation it will have a working ICT Governance Framework.

This ICT4E strategic plan recognizes the important role of DepED senior officials in ICT governance.

DepED is committed to ensuring that this ICT4E Plan is based on sound technology and efficient processes. To ensure this, a dedicated unit led by the DepED CIO is necessary. ICT coordinators shall serve as de facto CTO at their level.

Strengthening Schools and the Community’s Role

The successful integration of ICT into the Philippine education system will require a coordinated and comprehensive approach. DepED will lead in developing, implementing and coordinating all activities towards achieving our vision. DepED’s coordinating role includes planning and sustaining investment strategies to achieve our vision and facilitating collaboration between all key stakeholders.

School-based Management is the flagship program of the DepED towards carefully decentralizing the public basic education sector. It is guided by the fact that schools should be supported in order to be capable of making their own decisions regarding operational matters. This requires a total

⁷ Ziolkowski and Clark “Standards of ICT Governance” p. 79

⁸ <http://www.socitm.gov.uk/socitm/Events/ICT++governance.htm>

⁹ http://www.nccmembership.co.uk/pooled/articles/BF_WEBART/view.asp?Q=BF_WEBART_298897

community approach to the provision of basic education: employing effective and efficient processes and drawing in vital stakeholder support. By dovetailing again with this major initiative, integrating ICT into school operations will occur at different levels:

- Integration Level 1 – Standard
- Integration Level 2 – Progressive
- Integration Level 3 – Mature

On the third year of this plan's implementation, and after the establishment of the School-based Information System, DepED will develop benchmarks corresponding to the three Integration Levels above to assist teachers to more meaningfully integrate ICT across the curriculum.

The Role of Community

As learning will increasingly occur anywhere, anytime, the community will play a vital role as partners of DepED in ensuring a safe and responsible ICT learning environment. The wider community comprises the following groups: (a) parents, (b) tertiary institutions, (c) the private sector, (d) community centers and (e) local government units.

(a) Parents

In alignment with school-based management, it is recognized that parents will play a vital role in encouraging and guiding their children towards the achievement of 21st century skills. They are also the most important support mechanism for the success of SBM.

(b) Tertiary institutions

Tertiary institutions are well situated to be models of ICT implementation and use for schools. Many university departments and research groups have conducted successful programs, so that they are able to provide support and advice to schools.

(c) The private sector

DepED sees the private sector as an important partner in the implementation of this ICT4E strategy. Thus, it will continue to encourage the private sector to become involved in helping schools achieve the strategic thrusts of this Plan.

(d) Community centers

Local community facilities such as Community eCenters and local Internet Cafes will play an important role in overcoming the digital divide. Equity of access is an issue facing many Philippine students. While there are plans to increase the number of computers and access to ICT in each school, schools should continue to seek alternative ICT access for their students. This may include establishing an agreement with local Internet Cafes, providing students with vouchers to use in the cafes and where possible, making use of public internet access points.

(e) Local government units

With the implementation of SBM, the role of LGUs in school operations become increasingly important. They can provide significant resources that will enable schools to achieve the goals articulated in this plan. Strong relationships between LGUs and all public schools in its area of responsibility may be the key to achieving sustainable ICT-enabled schools.

Implementation

In the interim, the Undersecretary for Programs will oversee the implementation of this Strategic Plan with support from a fully-staffed ICT TC and the Information and Communication Technology Unit – Technical Service (ICTU-TS). In this, the Undersecretary for Programs will be guided by the targets and outcomes as outlined in Table 6 below.

It is underscored that all DepED units will be responsible for the implementation of this ICT4E Strategic Plan.

With the adoption of the DepED ICT Governance Framework, management of this plan will be transferred to the appropriate office.

As part of the implementation process, there is a need for on-going monitoring and evaluation (M&E) of the Five-Year ICT Strategic Plan. There will be two key issues. The first is to evaluate the outcomes and the performance of the sector (ie elementary, secondary, ALS), if necessary, help correct the direction, which the strategic and action-planning process is taking.

Second is to examine the impacts that ICT has made on possible changes in roles and interactions of the teacher and the students. This will give an indication of the degree of integration of ICT in the education system.

Consistent with this framework, an evaluation of teachers' changing competence, beliefs and attitude towards ICT use in classrooms should also be conducted to shed light on how these factors impinge on the nature and extent of changes that have emerged in terms of classroom roles and interactions. In order to achieve this, it is desirable and important that more in-depth qualitative studies be conducted to provide more vivid descriptions of the actual roles and functions of ICT inside classrooms, how it interacts with teachers and students, as well as how the school and system level factors contribute to/constrain the classroom implementation.

Findings from this study will inform DepED as to the kinds of policy adjustments that need to be made to enhance the implementation of ICT in schools to achieve the policy visions.

Table 5: Implementation Schedule (including Targets and Outcomes)

Goals	Outcomes	Strategies	Year 1	Year 2	Year 3	Year 4	Year 5	Success indicators
To completely integrate ICT into the curriculum	Stage 1: An enhanced level of awareness and use of ICT in the existing curriculum	Review the existing curricula and content with a view to suggesting common teaching and learning strategies using ICT.						Common teaching strategies using ICT
		Identify ICT resources that can serve the general purpose and specific elements of teaching and learning in subjects, cross-curricular areas and integrated studies						Common ICT resources that can be used in teaching and learning
		Encourage school-based efforts to adapt ICT to different learning areas, subjects, interests and abilities of students, and stakeholder expectations						Schools in different integration levels of ICT in operations based on benchmarks that will be developed by DepED
		Encourage schools to use ICT to make internal assessment less labour intensive						
		Conduct research on the impact of ICT on student learning from the experience of the more pioneering schools to facilitate informed decisions regarding the curriculum and assessment modes						
	Stage 2: The full integration of ICT in the enriched curriculum	Conduct a comprehensive review of the school curriculum to cater for new developments.						ICT enriched curriculum

Intensify relevant professional development programs	School Administrators leading in fulfilling the shared ICT vision and fostering a conducive environment and culture for the realization of the ICT4E plan	Provide school administrators with professional development on the different dimensions of ICT integration					50% of school heads trained on the different dimensions of ICT integration
	Teachers equipped with the necessary skills to be confident and capable users of ICT	All TEIs to align their courses to the DepED ICT competency standard					100% of TEIs that modified / aligned their courses to the DepED ICT competency standard
		All teachers must attain the Basic Level of ICT competency prior to entry into the profession					New hiring policies that will ensure that all new hires are at least at the Basic level of ICT competency
		Provide teachers with professional development in order to attain the Basic, Proficient and Advanced levels of ICT competencies in the six domains of (1) ICT, (2) Pedagogy, (3) Organization and Administration, (4) Professional Development, (5) Social, Ethical, Legal and Human Issues and (6) Evaluation and Assessment					Elementary: one-fifth and one-tenth of teachers reached "basic" and "proficient" levels respectively. At least one teacher per school at "advanced" level Secondary: all

								<p>teachers reached "proficient" level. At least one-third reached "advanced" level</p> <p>Tech-Voc: all ICT teachers reached "proficient" level. At least one-third reached the "advanced" level of competency</p> <p>ALS: one-third of mobile teachers reached "proficient" level. At least one-third reached the "advanced" level of competency</p>
	DepED officials, managers and non-teaching staff	Provide professional development programs on the appropriate and effective use of ICT for educational officials, managers and non-teaching staff						All non-teaching personnel completed PD program

Develop processes and systems that ensure efficient, transparent and effective governance	Establishment of a fully integrated system for governance.	Develop and finalize interoperable software systems and operational processes that comprise the different components of the enterprise architecture						<p>Major software systems and operational processes developed, utilized and ready to be integrated in the enterprise</p>
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								architecture
		Integrate ICT into SBM to ensure sustainability and a whole-school approach to ICT integration						Improved SBM guidelines and practice that integrates benchmarks of ICT integration
		Appoint a DepED CIO which will be supported by the appropriate offices and a comprehensive ICT governance framework						DepED CIO hired, comprehensive ICT governance framework implemented and capacitated offices that oversee ICT integration
Assess, utilize and further develop appropriate digital content	Fully integrated digital content across the curriculum.	Review the existing sources of digital content with a view to integrating it within the existing curriculum						100% of schools reviewed and integrated digital content into curriculum
		Develop tailor-made digital content for sharing and collaborating across DepED schools						User-generated content shared and used in pedagogy, training and governance
Establish the necessary ICT infrastructure	An enterprise-wide ICT infrastructure that underpins the delivery of the ICT Strategic Plan for Education.	Design and implement an overall ICT enterprise architecture						DepED Enterprise Architecture designed and implemented
		Ensure the integration ICT systems for pedagogy and professional development with ICT systems for governance and management						Integration of all independent but interoperable software systems

									into the enterprise architecture
		Continuous and timely delivery of infrastructure and services to schools and administrative units							<p>Elementary: utilization of any of the four classroom instructional models; one-fourth of schools with access to the internet; all school computers connected to a school intranet; all schools with internet and intranet with curriculum and technical support</p> <p>Secondary: utilization of three learning stations; all schools with access to the internet; all school computers connected to a school intranet; all schools with internet and intranet with curriculum and technical support</p> <p>Tech-Voc: all schools with computer labs,</p>

								ICT workshops and multimedia classrooms; all schools with access to the internet; all school computers connected to a school intranet; all schools with internet and intranet with curriculum and technical support ALS: all community learning centers with television, DVD player and computers (else, all mobile teachers with laptop and projector); all CLCs with access to the internet; all CLCs with curriculum and technical support
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Conclusion

The vision described in this Five-Year DepED ICT4E Strategic Plan is to transform our students into dynamic life long learners and productive and responsible citizens. This vision sees our schools as dynamic and innovative learning institutions where students will be critical thinkers and creative learners. Our students will be linked to the vast networked world of knowledge and information. This will enable them to acquire a broader knowledge base and a more global outlook. Our vision aims to develop in our students the capabilities to critically and intelligently seek, absorb, analyse, manage and present information. It also sees them as producers of new knowledge and products. This plan also envisions to develop habits of self-learning among students to nurture lifelong learning.

In order to achieve our vision we aim to integrate ICT into the curriculum so that it prepares our students to be digitally competent lifelong learners. Relevant professional development will be provided that will prepare ICT-competent teachers that are integral to the success of this vision. Supporting our vision will be systems and infrastructure that ensure efficient, transparent and effective governance.

Today's learners are growing up in a world characterized by technological change and innovation. DepED has recognized that there is a need to equip learners with the necessary skills and experiences that will enable them to become contributing members of the global community..

The successful implementation of the ICT4E Strategic Plan will lead to a new era in education. It is the aim of DepED that this policy document will provide the direction needed to integrate ICT within the Philippine education system and help move the country forward.

Glossary

Classroom instructional model	A classroom designed to provide large-screen projection video, sounds, and data from software, CD-ROM, and Internet sources (definition used by the ICTU)
Courseware	Digitally developed instructional materials
DepED administrators	Executives, directors, superintendents, chiefs, supervisors
Digital Content	Digitally developed instructional materials
Digital Age	A period of time when emerging technologies are pervasively used by society
Digitally Competent	Attributes of lifelong learning including abilities such as the capability to critically and intelligently seek, absorb, analyze, manage and present information
Education Stakeholders	Schools (administrators, teachers, students), local communities, parents, local government units, and foreign & local funding agencies, the private sector (business and academic communities, non – governmental organizations, private foundations, individuals)
Emerging Technologies	New developments in the field of technology that have educational applications
Enterprise Architecture	Detailed operational plan for ICT
ICT	Information and Communication Technology encompasses information and communication devices and the software that enables them to function. This may include: hardware, processes, and systems for storing, managing, communicating and sharing information
ICT integration	ICT is used as an integral tool in the learning process to extend student learning capabilities
Information Age	Also refers to global information age, knowledge society, digital age
Lifelong Learning	A competency acquired by learners that enable them to continue learning outside of formal schooling
Learners	All students, all teachers, parents, administrators, and the wider community
School administrators	School heads (principals, OICs, TICs), head teachers, coordinators
Students'	Common term denoting pupils (elementary K-6), students (secondary Y1-Y4), ALS learners (all ages), technical-vocational high school students
Learning Stations	Spaces in secondary schools, one for ICT skills development and two for ICT integration in subject matter areas (e.g, library, computer laboratory and multimedia room)
Pedagogy	Process of teaching and learning
Teachers	Facilitators of learning

Annex 1: Acknowledgements/Process

We want to express appreciation to AusAID for conducting the project “Building Capacity of ICT Strategic Implementation for Basic Education in the Philippines” which commenced in August 2007. The aim was to strengthen the capacity of the Department of Education (DepED) in the Philippines to develop and implement a cost-effective strategy for the use of ICT in Basic Education. The principal objective was to develop a Strategic Plan for the successful use of ICT in relevant aspects of the school system which will be formally adopted and implemented by DepED.

A team of key personnel from central and regional offices of the Department of Education underwent training and professional development in the leadership and management of ICT-enhanced educational interventions. Queensland University of Technology as project leader coordinated the drafting of this plan. The team members are listed below:

Members	Role Description
Mr Mari Paul C. Soriano	Director, Technical Service
Ms Maria Victoria D. Abcede	Bureau of Secondary Education
Mr Albert Alano	Property Division
Ms Ofelia Algo	EDPITAF
Ms Erlinda Atienza	ICT Regional Coordinator, DepED CARAGA
Ms Angelita Esdicol	Bureau of Elementary Education
Ms Juanita Ferido	ICT Regional Coordinator, DepED NCR
Mr Deogracias Genito	IT Office I, Database Management Unit, Research & Statistics Division, Office of Planning Services
Mr Elmer Guizano	Information and Communications Technology Unit, TS
Mr Eric Labre	IMCS
Ms Abigail Lanceta	Bureau of Alternative Learning Systems
Mr Gilbert Morong	Budget Division
Ms Elizabeth Perfecto	ICT Regional Coordinator, Region III
Ms Yrrah Pineda	Technical-Vocational Education Task Force
Mr Ferdinand San Jose	Information and Communications Technology Unit
Ms Rhodora Sison	ICT Regional Coordinator, DepED Region VIII
Mr Renato A. San Juan Jr.	Bureau of Alternative Learning Systems
Mr Nicholas Tenazas	EDPITAF

Others who assisted at various times throughout the course of our work included the consultants listed below:

Dr. Emmanuel Lallana	DepED ICT Consultant
Mr. John Macasio	DepED ICT Consultant
Mr Elcid C Pangilinan	Special Assistant to the Secretary
Mr Ricardo Santos	Special Assistant to the Secretary
Ms Maria Fe Ferriols	Beacon Frontline Solutions Inc.

During the period August 2007 to April 2008, the team formulated practical plans around ICT implementation and usage in schools, involving the selection of realistic priority areas to ensure the successful use of ICT in relevant aspects of the school system. The process included three training workshops, conducted in Manila and Brisbane. Evaluation/research studies and lessons learnt from

the experiences of other countries which are further down the path of ICT integration offered valuable insights and provided guidance in the development of this Five-Year Strategic Plan.