Annex 1

Synthesis of Contents/Topics of Curricula for Training Teachers and Others on ICT

A. Introduction to ICT and its application in education
   - Role of ICT in teaching methodology renovation (ICT and pedagogy)
   - New roles of teachers in the ICT environment
   - Selecting strategies/technologies for teacher training

B. Optimizing the use of ICT in schools (for administrators and policy-makers)
   - Overview of ICT use in education and introduction to instructional technology
   - Drivers and barriers to the use of ICT in education
   - Strategic planning, developing the ICT in education vision
   - The need for a technology plan in schools – architecture and infrastructure, functions, services and capabilities
   - Role of school administrators
   - Issues in teacher training and professional development
   - Technical sustainability
   - Identifying opportunities to apply ICT and designing ICT strategies
   - Creation of Acceptable Use Policy
   - Information literacy and telecollaborative learning
   - Financing centre operations
   - Partnerships, community mobilization and strategies for resource generation
C. ICT and pedagogy

- Pedagogical principles for integrating ICT into classrooms
- Building critical thinking skills in the classroom
- Constructivism in the classroom
- Creating units to support differing learning styles – multiple intelligences
- Curriculum mapping
- Utilizing technology in creating problem-based curriculum
- The Internet as a pedagogical innovation

D. Basic hardware/software/applications per se (not necessarily linked to teaching/learning)

- Basic computer parts and functions (opening, closing and saving files, optimizing the hard disk, managing files, opening and renaming files, viruses, zipping and unzipping, etc.)
- Operating systems (Windows Operating System, others)
- Software applications – MS Office (specify – not necessarily linked to teaching/learning)
- Word processing (MS Word)
- Spreadsheets (Excel)
- Presentations (PowerPoint)
- Website navigation and Internet searching (Internet Explorer, Netscape)
- E-mailing (MS Outlook, Eudora, Pegasus)
- Website development/designing (FrontPage, Dreamweaver)
- Graphics and drawing (Paint Shop Pro, PhotoDraw, Adobe Illustrator, Inspiration)
- Database, data entry, and programming (Access, Pascal, Coldfusion)
- Desktop publishing (Publisher, PageMaker, etc.)
- Designing print materials (elements of design and layout, using fonts, graphics and colours)
- Scanning text and graphics
- Video – video production and editing (script writing, shooting, video graphics, sound recording, editing)
- Chatting, discussing (ICQ)

E. Use of basic software/applications in teaching and learning

- Creating students report in Word, Access, others
- Using Excel to create class lists, for assessment record-keeping in the classroom, alarms, split screens, assessment, and print worksheets and spreadsheets etc.
- Creating animations for integration into art studies
- Using WebQuests (online problem solving tasks and to support a thinking-oriented and student-oriented curriculum) to collaboratively develop online curriculum resources
- Using PowerPoint for presentations in the classroom for a variety of curriculum areas
- Using NetMeeting in the classroom, including the use of chat, whiteboard sharing, files, cameras and microphones
- File management for teachers for creating folders, moving files, renaming files, etc. for their assignments and documents
- Using Publisher to create a class newsletter or teachers’ newsletter and students’ publications
- Using FrontPage/Dreamweaver to create a classroom webpage
- The Internet for teaching/learning
  - Effective searching strategies and techniques
  - Evaluating websites
  - Online ethics and Netiquette
  - Intellectual property and copyright laws
  - Creating an Acceptable Use Policy
  - Internet access and safety issues
  - Using the Internet for teacher-led instruction, student-directed learning and project-based learning
  - Creating an Internet-based lesson plan
  - Meeting academic standards with the Internet
  - Publishing on the Web
Creating a website or web page for teaching/learning
- Website as a pedagogical communications tool
- Website as a container of curricular materials
- Web publishing in the classroom
- Tools and fundamentals for web page creation and publishing
- Building a Web-based project or activity that integrates the Web into the classroom

Building a telecollaborative library

Using e-mail for telecollaboration

Developing productivity tools like templates, tests, mark sheets

Creating multimedia presentations for teaching a lesson
- Various basics, tools, software, multimedia applications to create a multimedia project for the classroom (HyperStudio, KidPix, PowerPoint, etc.)
- Search from the Internet for good multimedia lessons, activities and resources as well as pedagogical issues
- Creating a standards-based lesson, unit or project that integrates multimedia

F. Integrating ICT into classrooms and subjects

1. ICT and pedagogy integration (instructional technology and use in various models of teaching/learning, as well as design and principles for integration into subject curriculum and classrooms)

- Technology and instructional concept, design and application to teaching/learning principles/models
  - Instructional strategies and learning effectiveness
  - ICT-based tools for designing constructivist activities; project-based work; building critical thinking skills; collaborative activities; interdisciplinary project work; other interactive multimedia-based activities to empower the learners as a whole
  - ICT-based activities to support differing learning styles and those with special needs
Instructional media design and multimedia design based on various learning principles

The Internet as a pedagogical innovation

Principles for integrating ICT into the classroom

Curriculum mapping

ICT use in creating problem-based curriculum

Planning and developing a technology-integrated lesson (curriculum enrichment)

- Analysing a subject and/or reviewing a lesson plan of a specific subject and planning to incorporate effective teaching/learning principles and use of ICT
- Improving or creating an ICT-based lesson plan (empowering subject/lesson plan with ICT); or preparing a unit lesson plan template, portfolio rubric and sample unit portfolios of lessons
- Locating resources from the Internet; CDs, etc. for the sample unit/lesson plan
- Creating subject unit/lesson plan support materials (spreadsheets, multimedia presentations, publications, student and teacher's support materials, grade book worksheet, creating student database, websites, videos, PowerPoint, etc.)
- Putting a lesson plan together
- Assessing lesson plans
- Planning on how to integrate the improved lesson into the teaching of a specific subject

Best practices and ICT models of technology integration

Integrating telecollaboration and online discussion forums into existing curriculum

Teaching and classroom management

Introduction to the One-Computer classroom

The Next Wave: Cutting-edge Technologies in Education

2. Integrating ICT into teaching specific subjects

Use of ICT in science
- How ICT improves the teaching/learning of science or how to improve science teaching through intelligent and informed use of technology
- Searching and using Internet resources for science materials and lessons
- Science education on the Internet
- Use of computers software and calculators for science teaching
- Use of computers to simulate scientific phenomena and use of graphic calculators to collect and analyse data
- Constructing a technology-enhanced lesson or a lesson plan within a science curriculum

- Use of ICT in mathematics
- How ICT improves the teaching/learning of mathematics or how to improve mathematics teaching through intelligent and informed use of technology
- Searching and using Internet resources for mathematics materials and lessons
- Use of computers software and calculators for mathematics teaching
- Use of computers and graphic calculators to collect and analyse data and to build and test mathematical models of the real-world
- Constructing technology-enhanced lessons or lesson plans within a mathematics curriculum

- Use of ICT in language arts
- How ICT improves the teaching/learning of language or how to improve language teaching through intelligent and informed use of technology
- Searching and using Internet resources for language materials and lessons
- Searching literature-based, creative writing, problem-solving Internet projects with the option of using interpersonal exchanges, virtual gatherings, peer feedback or mentoring to support student learning
- Constructing a technology-enhanced lesson or a lesson plan within a language arts curriculum
Use of ICT in social studies
- How ICT improves the teaching/learning of social studies or how to improve social studies teaching through intelligent and informed use of technology
- Searching and using Internet resources for social studies materials and lessons
- Searching problem-solving, enquiry and creative thinking materials with the option of using interpersonal exchanges, virtual gatherings, peer feedback or mentoring to support student learning
- Constructing a technology-enhanced lesson or a lesson plan within a social studies curriculum
- Web Quests

Use of ICT in health-education and PE

Use of ICT in chemistry

ICT and multicultural education

Integrating technology into K-12 classrooms
- Reviewing available instructional technologies and models of technology use in the classroom
- Understanding the benefits of incorporating technology into education
- Technology integration – planning and implementing technology use in the classroom
- Classroom management
- Evaluating lesson plans that integrate technology
- Understanding classroom management issues
- Integrating the Internet and other resources into elementary classrooms (search techniques, safety, ethical/legal issues, evaluating websites, teacher and student Internet resources)
- Software evaluation and integration in classrooms
- Creating a technology-enhanced lesson or a teacher/student project
- Web page development for teachers
■ Teaching with educational software and other applications
  - Teaching with WebQuests
  - Logo
  - Science software, such as Redshift, Eco Ranger, Dynamic Rain Forest, Thinking Science, etc.

■ Use of software that employs a simulator to simulate experiments and that can create interactive activities in physics, science, etc.

■ Assessment and evaluation (understanding and evaluating students’ learning in an ICT environment and measuring ICT impact and effectiveness)

G. Use of online communication tools

■ Information literacy

■ Online learning environment

■ Online communication tools - the website as a pedagogical communications tool

■ The Internet
  - Introduction to telecommunications, primer on the Internet and the World Wide Web
  - Useful Internet resources
  - Using Internet tools, search engines, e-mail, etc.
  - Dealing with Internet information (safe access and Acceptable Use Policies; copyright issues; evaluating and citing online resources)

■ Collaborating online (telecollaboration)
  - Joining a collaborative project online
  - Online search for telecollaborative projects
  - Schools online project updates
  - Designing telecollaborative projects (steps in designing and implementing; analyzing a telecollaborative project; creating a telecollaborative project website; publicizing telecollaborative projects)
  - Project-based learning
  - Creating a pilot e-mail project
- List server simulation
- Creating an electronic mailing list
- Using online experts to enhance student interest and learning

**H. Technology management and installation**

- Troubleshooting
  - Approaches and techniques/tips for troubleshooting (peripherals, networks, backups)
  - Operating system configuration
  - Hardware and software basics
  - Computer maintenance and preventive measures (utilities, viruses)
  - Technology resources and repairs (Internet resources for troubleshooting)
  - Installation of memory chips
  - Preventive maintenance and repair strategies
  - Report of a troubleshooting experience

- Essentials of networks (LAN)
- Setting up an Intranet
- Setting up, installing and using Linux
- Zipping and unzipping

**I. Linking schools and the community**

- Schools and the community: challenges and opportunities for linking through technology
- What are telecentres?
- Setting up telecentres in schools (needs assessment, designing and setting up, disseminating)