

# Integration of ICT In Education

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# ICT as an Instructional Tool

- It is a tool for pedagogical practices, for hands on practices
- Provides learner-centred and knowledge-centred learning environment
- It increases innovation and creativity of teachers and students
- ICT by its nature calls for innovation
- Makes students to be more engaged with their own learning
- Students enjoy using computers and can spend more time working on them

# Factors Influencing Use of ICT in Education

- The biggest challenge is to use ICT effectively to maximise learning and to enhance teaching
- A number of factors combine to determine the level and quality of use of ICT in learning and teaching
  - Policy and planning
    - These should identify the objectives/aims of using ICT in learning and teaching
    - Determine priorities and resources

# Factors Influencing Use of ICT in Education

- Should be related to more general policies and plans for learning and teaching
- Key features of policy on ICT in education include:
  - development of learners' and teachers' ICT skills
  - ICT equipment and software acquisition

## – Roles and Responsibilities

- The implementation of policies and plans will depend on:
  - Proper identification of the stakeholders
  - Identification of roles and responsibilities
- The expectation is that the role players will take forward the agenda set by policies and plans

## – Infrastructure and resources

- These will also determine the feasibility of the implementation of the use of ICT in learning and teaching
- The infrastructure must be properly installed and maintained

## – Technical Support

- There must be support systems for the educators
  - maintenance of hardware and software
- Ensure that equipment used is not outdated
  - Supports the use of modern software for learning

- It is important for the successful implementation of ICT in education
- The level and quality of such technical support have to be high
- Where the level of technical support is poor, user confidence that they will have reliable access falls
- Teaching staff make fewer plans to use ICT

#### — Confidence and competence of teaching staff

- The state of the art equipment can be procured, BUT ...
- if there is not enough emphasis on developing teachers' and learners' capacity to make best use of the ICT equipment, the equipment will remain a waste

- The use of ICT for teaching will only be effective if the teaching staff are confident in the use of ICT
- Teaching staff should understand fully their role in the effective promotion and use of ICT in learning and teaching
- Understand the benefits to be gained from the use of ICT in education
- There should be professional development for the teaching staff that is specific to curriculum-based ICT
- Teachers should be helped to identify and develop effective approaches to using ICT in education

– ICT is advancing at a fast pace

- A state of the art technology found today can be outdated/obsolete in a few months time
- It is essential to familiarize educators with the technology and keep with the times
- This necessitates ongoing training on using ICT tools in teaching



# Benefits of using ICT in teaching and learning

- Increase motivation
- Deepens understanding
- Promotes collaborative learning - where groups of students can work together
- Promotes new approaches to teaching and learning
- Promotes learner autonomy
- Facilitates learning for students who have different learning styles and abilities
- Makes learning more effective, involving more senses in a multimedia context

# ICT and teaching methods

- Teachers have to use methods that will bring maximum benefit to learning
- Use of collaborative learning/working – learner and learner, teacher and teacher
- Use of self directed learning
  - Students can only adopt responsibility for their own learning process, if they are in the position to organise and drive their learning process themselves

- They can only then cope with this demand if they are able to use the prepared learning environment accordingly
- As the teacher you have to move away from the traditional way of telling learners everything
- Learning process of the student is not just the input of presented knowledge which has to be reproduced in the examination

- In a constructivist perspective the students' learning should be an active, individual process that is dealing with the construction of cognition and competences
- Learners should be able to create in the process, their own structure of knowledge of the studied subject
- The use of ICT in teaching aims to support the students in this process of knowledge construction

- The role of the teacher is not to teach but to support and facilitate more independent, self-directed learning process

# Educational Software

- Proprietary software
  - e.g. Virtual laboratories by Pearson
- Open Source software
  - Several distributions of linux have free educational software
- PhET simulations <http://phet.colorado.edu/>
  - What do simulations do?
    - animate what is invisible to the eye through the use of graphics

– Simulations can be used

- to introduce new topics
- to build concepts or skills
- to reinforce ideas
- to provide final review and reflection
- The invisible (photons, electrons, fields, ...) can be made visible
- can be used in classrooms where the real equipment is either not available or impractical to set up
- they can be used to do “experiments” that are impossible to do otherwise

## – Video clips

- Can also be used

<http://www.pearsonschoolsandfecolleges.co.uk/FEAndVocational/Construction/CarpentryJoinery/Standaloneproducts/CarpentryandJoineryInteractiveSkillsCDROM/CarpentryandJoineryVideoInteractiveDisk.aspx>

## – Simulations and video clips provide an innovative resource that

- gives learners a chance to better understand complex techniques, and real work-site practices
- help learners better understand skills and perform the techniques themselves
- Interactive quizzes and worksheets support/reinforce animations and videos



- Provide visual representation of abstract concepts
  - Help students build mental models of things that are often difficult to understand
- PhET simulations can be used online
  - Can be downloaded and be installed on your computer
  - Your computer must have Flash and Java installed in order to use PhET simulations
  - There are versions for Windows, Mac OS, and Linux

- Smart Notebook
  - Comes with Smart Technologies Products
    - Smartboard Interactive White Board
    - Sympodium

# Digital Learning material

- Teachers can develop their own digital material
  - Kompozer
    - hotpotatoes
  - Learning Content Development System (LCDS)
- Digital learning material has to be interactive
- Digital learning material can be used on a Learning Management System like Moodle, WebCT, Blackboard etc.

# Digital Learning material

- Learning Management Systems (LMS) allow for online classes
  - Organize courses – enrolment dates, datelines for assignments
  - Can be organized as a series of topics that can be covered in any order at the pace of individual students
  - The teacher can easily track students progress and course completion

# Digital Learning material

- LMS can be used as a website on the institution's network or intranet
- Digital learning material can be put on a CD ROM or Flash disk

# Internet

- Storehouse of information sources
- Provides learning and research opportunities
- Provides opportunities for enquiry based learning
- Teachers and learners are able to access some of the largest information archives
  - NB
    - can be lost in the information forest
    - be careful of misinformation and inaccuracies that are also present