ROLE OF TEACHERS IN USING ICT FOR TEACHING-LEARNING

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• **ICT is defined as, “diverse set of technological tools and resources used to communicate, create, disseminate, store and manage information”**

--- Blurton.,
Necessity of ICTs

- Globalization of
  - Economy
  - Information
- Tech Innovations
- Knowledge-based
  - Economy
  - Society
- Escalating Demand for Education & Quality Teachers.

Effective Learning

- For All
- Anytime
- Anywhere
Dilemmas

Myths

• Belief
• Doubt
• Wait
• Monolithic
• Automatic
• Computers
• Substitute
• Vendors
• Parents
• Business
• Techies

Realities

- Analyze Educational objectives
- Determine Objective for ICT
- Understand Potential of ICTs
- Examine suitability of ICTs
- Plan program of investment
- Implement prerequisites and corequisites
- Evaluate and adjust continuously
Potential of ICTs

- Access
- Efficiency
- Learning
- Teaching
- Skill Formation
- Lifelong Learning
- Planning & Management
- Community Linkages
## Traditional and E-learning approaches

<table>
<thead>
<tr>
<th></th>
<th>Traditional Classroom</th>
<th>E-Learning</th>
</tr>
</thead>
</table>
| **Classroom**       | • Physical – limited size  
                      | • Synchronous                           | • Unlimited  
                      | • Anytime, anywhere       |
| **Content**         | • PowerPoint/transparency/etc 
                      | • Textbooks/library  
                      | • Video                           | • Multimedia / simulation  
                      | • Collaboration           | • Digital library  
                      |                                 | • On demand                 |
| **Personalisation** | • One learning path | • Learning path and pace determined by learner |

- **Traditional Classroom**
  - Physical – limited size
  - Synchronous

- **E-Learning**
  - Unlimited
  - Anytime, anywhere
  - Multimedia / simulation
  - Digital library
  - On demand
  - Syn & Asyn. Communication
  - Learning path and pace determined by learner
## Changes in Teaching-Learning Environment

<table>
<thead>
<tr>
<th>MODEL</th>
<th>FOCUS</th>
<th>ROLE OF LEARNER</th>
<th>TECHNOLOGY</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRADITIONAL</td>
<td>TEACHERS</td>
<td>PASSIVE</td>
<td>CHALK &amp; TALK</td>
</tr>
<tr>
<td>INFORMATION</td>
<td>LEARNERS</td>
<td>ACTIVE</td>
<td>PERSONAL COMPUTER</td>
</tr>
<tr>
<td>KNOWLEDGE</td>
<td>GROUP</td>
<td>ADAPTIVE</td>
<td>PC+ NETWORK</td>
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</table>
### Changes in Teachers' Roles

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmitter of Knowledge</td>
<td>Guide &amp; Facilitator of Knowledge</td>
</tr>
<tr>
<td>Controller of Learning</td>
<td>Creator of Learning Environment</td>
</tr>
<tr>
<td>Always Expert</td>
<td>Collaborator &amp; Co-learner</td>
</tr>
<tr>
<td>Learning to use ICT</td>
<td>Using ICT to Enhance Learning</td>
</tr>
<tr>
<td>Didactive/ Expository</td>
<td>Interactive/Experiential/Exploratory</td>
</tr>
<tr>
<td>From</td>
<td>To</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>Passive Learner</td>
<td>Active Learner</td>
</tr>
<tr>
<td>Reproducer of Knowledge</td>
<td>Producer of Knowledge</td>
</tr>
<tr>
<td>Dependent Learner</td>
<td>Autonomous Learner</td>
</tr>
<tr>
<td>Solitary Learner</td>
<td>Collaborative Learner</td>
</tr>
<tr>
<td>Solely Learning Content</td>
<td>Learning to Learn/Think/Create &amp; Communicate</td>
</tr>
<tr>
<td>From</td>
<td>To</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>Memorizing Facts</td>
<td>Inquiry Based</td>
</tr>
<tr>
<td>Artificial Teaching Exercises</td>
<td>Authentic Learning</td>
</tr>
<tr>
<td>Rigid Delivery (Fixed Time &amp; Space)</td>
<td>Open &amp; Flexible Delivery (Any Time &amp; Anywhere)</td>
</tr>
<tr>
<td>Single Path Progression</td>
<td>Multi Path Progression</td>
</tr>
<tr>
<td>From</td>
<td>To</td>
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<tr>
<td>-------------------------------</td>
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</tr>
<tr>
<td>Single Sense Stimulation</td>
<td>Multi Sensory Stimulation</td>
</tr>
<tr>
<td>Single Media Application</td>
<td>Multimedia Application</td>
</tr>
<tr>
<td>Delivery of Information</td>
<td>Exchange of Information</td>
</tr>
<tr>
<td>Monologue Communication</td>
<td>Dialogue &amp; Collaborative</td>
</tr>
<tr>
<td>Analogue Resources</td>
<td>Digital Resources</td>
</tr>
</tbody>
</table>
New requirements

Today’s teachers are required to be:

- Facilitators, helping learners to make judgments about the quality and validity of new sources and knowledge
- Open-minded, analytical and independent professionals
- Active cooperators and collaborators
- Mediators between learners, what they need to know and where that knowledge can be found
- Providers to reinforce understanding
New competencies

For teachers to be able to integrate the use of ICTs into their lessons, a variety of skills need to be developed:

- Creativity
- Flexibility
- Logistic skills: assigning work, grouping students and devising new locations for learning to take place
- Skills for project work
- Administrative and organizational skills
- Collaborative skills
Teaching aids will change

Blackboard → OHP → TV/VHS → LCD/PC/Whiteboard
### ICTs for What Purpose?

#### ICTs for Learning Objectives

<table>
<thead>
<tr>
<th>Learning Objective</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Text</td>
</tr>
<tr>
<td>Storage or display</td>
<td>x</td>
</tr>
<tr>
<td>Exploration</td>
<td>x</td>
</tr>
<tr>
<td>Application</td>
<td>x</td>
</tr>
<tr>
<td>Analysis</td>
<td></td>
</tr>
<tr>
<td>Evaluation</td>
<td>x</td>
</tr>
<tr>
<td>Constructing or design of project</td>
<td>x</td>
</tr>
</tbody>
</table>
### ICTs for Teaching Objectives

<table>
<thead>
<tr>
<th>Teaching Objective</th>
<th>Text</th>
<th>Audio</th>
<th>Video</th>
<th>Computer</th>
<th>Internet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Demonstration</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Drill and practice</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Animation and simulation</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Research</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Collaboration/communication</td>
<td></td>
<td></td>
<td></td>
<td>networked</td>
<td>x</td>
</tr>
<tr>
<td>Management of student learning</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>
E-learning

• In an on-line multimedia learning environment:
  – teaching & learning is ‘one-to-one’ (individual)
  – more interactivity (in normal classroom, it varies with the class size)
  – learner-centred
  – Learner monitoring & grading system
Benefits

• Convenient
  – self-service (mix and match)
  – on-demand (anytime, anywhere)
  – private learning
  – self-paced
  – Flexibility: (modular package)
Teacher’s Obligation

- Use all available technology
- Encourage collaborative learning
- Incorporate ‘old’ & ‘new’
- Lay foundation for lifelong learning
A technically competent teacher should be able to:

- Operate computers & use of their basic software for word processing, spread sheets, power point, multimedia, web-surfing etc.,
- Evaluate & use computers & related ICT tools for audio/video preparations & instructions;
- Apply the current instructional principles, research and appropriate assessment practices to the use of ICT;
- Evaluate educational software to achieve updated uses of modern software;
- Search the internet for e-resources and use them appropriately;
- Prepare the discipline specific e-learning contents using the above ICT tools and methods;
• Create effective, computer-based, multiple tool-based presentations instead of ritualistic PPTs;
• Create multimedia content to support instruction;
• Create hypertext documents and ‘push’ them intermittently to support class room instruction;
• Develop e-conversation with students on curriculum-based teaching-learning through email, discussion e-box, e-Q/A etc;
• Integrate the knowledge & use of ICT into all student activities across the curriculum;
• Keep up to date as far as educational technology is concerned;
• Perform the methodology of online assessment and evaluation;
• Demonstrate the knowledge of ethics and equity issues related to technology.
E-learning tools: E-mail

- Every teacher should have an e-mail account for T/L related activities to:
  - Communicate with students
  - Communicate with parents
  - Students can submit assignment
  - Can have attachments
  - Create a paperless environment
  - Simple but effective
  - Efficient and cost effective
E-learning tools: Online Forum

- Asynchronous discussion forum
- Teacher can create discussion groups
- Teacher could post a question and request students to comment
- Students can post their comments
- Can encourage community participation
- Collaborative learning can be fostered
- Feedback from diverse culture
The term **Open Educational resources (OER)** are defined by a report to the William and Flora Hewlett Foundation (2007) as, “open educational Resources are teaching, learning or research materials that reside in the public domain or have been released under an intellectual property license that allows for free use or repurposing by other. Open educational resource includes full course, course materials, module, textbook streaming video, test, software and any other tools, material or techniques used to support access to knowledge.”
The Open Course ware consortium (www.ocwconsortium.org) is a collaboration of more than 200 higher education institutions and associated organizations from around the world creating a broad and deep body of open educational content using a shared model. Users can find course materials by browsing individual Open Course Ware sites or by searching across all course materials.
• MOOC – (Massive Online Open Coursewares)
• Online based courses offering + certification programs
• https://en.wikipedia.org/wiki/Massive_open_online_course
• https://www.edx.org/
• https://www.coursera.org/
• https://www.udemy.com/
<table>
<thead>
<tr>
<th>No.</th>
<th>Title</th>
<th>Category</th>
<th>Source</th>
<th>Author</th>
<th>Language</th>
<th>Licence</th>
<th>Features</th>
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<tbody>
<tr>
<td>1.</td>
<td>Educational Research</td>
<td>Module</td>
<td><a href="http://hdl.handle.net/123456789/80">http://hdl.handle.net/123456789/80</a></td>
<td>Osman, Ridwan Mohamed</td>
<td>English</td>
<td>CC-By-SA</td>
<td>In this module you will learn how to identify research problems, write a plan to study the problems, execute this plan and generate useful knowledge and practical recommendations to solve educational problems.</td>
</tr>
<tr>
<td>2.</td>
<td>Artificial Intelligence</td>
<td>Book</td>
<td><a href="http://www.oercommons.org/courses/artificial-intelligence-4">http://www.oercommons.org/courses/artificial-intelligence-4</a></td>
<td>Paul Curzon</td>
<td>English</td>
<td>CC-BY-NC</td>
<td>This activity explores what it means for a computer to be intelligent and introduces the topic of what a computer program is and how everything computers do simply involves.</td>
</tr>
<tr>
<td></td>
<td>Basic research methods</td>
<td>Collection</td>
<td>Train Online</td>
<td>English</td>
<td>CC_BY</td>
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<td>Basic research methods</td>
<td><a href="http://www.oercommons.org/courses/basic-research-methods/view">http://www.oercommons.org/courses/basic-research-methods/view</a></td>
<td>Train Online</td>
<td>English</td>
<td>CC_BY</td>
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This unit covers basic research methods in an easily accessible way, and includes research tips and pros and cons for each method. It also takes learners through a step-by-step approach to planning research.
<table>
<thead>
<tr>
<th></th>
<th>Case Scenarios In Pediatric Practices</th>
<th>Book</th>
<th>Dr. Joslin Dobe</th>
<th>English</th>
<th>CC-BY-NC</th>
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</thead>
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<td><strong>Available at KNUST</strong></td>
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<thead>
<tr>
<th></th>
<th>Acid Base Balance</th>
<th>Module</th>
<th>Open Stax College</th>
<th>English</th>
<th>CC-BY-Nlast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Identify the most powerful buffer system in the body</strong></td>
<td><strong>Explain the way in which the respiratory system affects blood pH</strong></td>
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</tr>
<tr>
<td>S. No</td>
<td>Tools</td>
<td>Website</td>
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</tr>
<tr>
<td>1.</td>
<td>Big Think</td>
<td><a href="http://www.bigthink.com">www.bigthink.com</a></td>
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</tr>
<tr>
<td>2.</td>
<td>Cosmo Learning</td>
<td><a href="http://www.cosmolearning.com">www.cosmolearning.com</a></td>
<td></td>
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<tr>
<td>3.</td>
<td>Coursera</td>
<td><a href="http://www.coursera.org">www.coursera.org</a></td>
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<td>4.</td>
<td>EdX</td>
<td><a href="http://www.edx.org">www.edx.org</a></td>
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<tr>
<td>5.</td>
<td>Learner.org</td>
<td><a href="http://www.learner.org">www.learner.org</a></td>
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<tr>
<td>6.</td>
<td>MIT Open Course Ware</td>
<td><a href="http://www.ocw.mit.edu">www.ocw.mit.edu</a></td>
<td></td>
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<tr>
<td>7.</td>
<td>MIT Video</td>
<td><a href="http://www.video.mit.edu">www.video.mit.edu</a></td>
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<tr>
<td>8.</td>
<td>Research Channel</td>
<td><a href="http://www.youtube.com/user/researchchannel">www.youtube.com/user/researchchannel</a></td>
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<tr>
<td>10.</td>
<td>Open YaleCourses</td>
<td><a href="http://www.oye.yale.edu">www.oye.yale.edu</a></td>
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</tr>
</tbody>
</table>
ICT RESOURCES IN INDIA

- What India does?
- [http://vlab.co.in/](http://vlab.co.in/)
- [http://ekalavya.it.iitb.ac.in/](http://ekalavya.it.iitb.ac.in/)
- IIT Bombay Open Source Knowledge Initiative – Digital Content (eContent Programme)
- [http://nptel.ac.in/](http://nptel.ac.in/)
- Web & video Based Courses – E-certificate courses subscription newly introduced, exam centers getting announced
- Virtual Labs access apart from IITs, Amritha is also doing a good job
- [http://vlab.amrita.edu/](http://vlab.amrita.edu/)
• **Plenty for Open Source Softwares are available (Free)**
  • E-learning Management system called [Moodle (open source)](https://moodle.org/). Participants can enroll for their course and teacher can upload their e-resources, assignments, quiz, survey, forums and track the course-completion.

• **Open Source Web Conferencing system – Bigbluebutton** [https://en.wikipedia.org/wiki/BigBlueButton](https://en.wikipedia.org/wiki/BigBlueButton)

• There is an alternate social learning platform - to make it Facebook like platform for learning called [Edmodo](https://www.edmodo.com/)

• Online survey/quiz/polling based platforms like [Qualtrics](https://www.qualtrics.com), [Surveymonkey](https://www.surveymonkey.com) can be integrated for analysis as well.

• Android App Based Learning – Google Play Store [https://play.google.com](https://play.google.com)

•
TRAINING TO BECOME ICT ENABLED TEACHER

• PEDAGOGY
• CURRICULUM DEVELOPMENT
• FULL INTEGRATION OF ICT INTO CURRICULUM
• STAFF DEVELOPMENT
• SUPPORT SYSTEM
Building an e-learning culture

**Learner:**
- Self-directed
- Self-motivated
- Self-regulating
- Lifelong learning

**Teacher:**
- Develop knowledge & skills
- Understand learning and its need
- Facilitate learning
- Create learning opportunities

**Administrator:**
- Create Learning environment
- Provide ICT infrastructure
- Resources for lifelong learning
From Potential to Effectiveness

1. Educational Policy
2. Approach to ICTs
3. Infrastructure
4. ICT-Enhanced Curriculum & Content
5. Committed and Trained Personnel
6. Financial Resources
7. Integration
8. Piloting and Evaluation
9. Commitment from Management
NEED OF THE HOUR FOR THE 21ST CENT. TEACHER

Paradigm shift in:

• Mindset;
• Resistance for change;
• Openness for learning emerging ICT methods
• Patience to search world-wide web
• Preparation for every class as an interactive/Participatory learning along with students
Teaching- Learning thro’ ICT: Blended mode

Chalk-and-board has long ruled the classrooms
• will not be eliminated
• Less emphasis
• Evolving teachers need resource support

Interactive Digital Content: Integrated with ICT
• more emphasis with world wide resources
• on demand learning
• Interactive & participatory