Framework tools for ICT enabled teaching and learning in medical and allied health courses

Dr. Reem Rachel Abraham
Department of Physiology
Melaka Manipal Medical College (MMMC)
Manipal Campus, Manipal University,
Karnataka, India
Introduction

Part of the mainstream in medical education

Exploits interactive technologies and communication systems to improve the learning experience.

Potential to transform the way we teach and learn.
Figure 1: Conceptual model of an educational system using ICT’s
E-learning-the use of internet for education

- **NOT** a broadcast of documents in an electronic format

Learner-centred Engages students Collaboration, communication Flexible
“Within less than two student generations, communication and information technology (C&IT) has been repositioned as an integral component of the medical school environment” (Ward et al., 2001, Lancet, p. 792).

The European Commission noted in 2003 that “The spread of the internet and new information and communication technologies (ICT) has transformed the way people communicate, the way industries operate, the way governments interact with their citizens, and, significantly, the way people learn”

Technology may be queen but pedagogy is king (Harden)
### E-learning-SWOT Analysis

<table>
<thead>
<tr>
<th><strong>Strengths</strong></th>
<th>Ability to offer education to large numbers of students from distant locations.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower costs (travel, instructor fees).</td>
</tr>
<tr>
<td></td>
<td>Shorter courses mean less time commitment necessary from corporate students.</td>
</tr>
<tr>
<td></td>
<td>Lower cost means education is more accessible to people with limited financial resources.</td>
</tr>
<tr>
<td></td>
<td>Use best instructors making best courses available to all.</td>
</tr>
<tr>
<td><strong>Weaknesses</strong></td>
<td>Large commitment to technology needed from universities, corporations offering e-learning courses.</td>
</tr>
<tr>
<td></td>
<td>Lack of face-to-face contact with students.</td>
</tr>
<tr>
<td></td>
<td>Current technology does not support low-cost, high-bandwidth, synchronous student-teacher interaction.</td>
</tr>
<tr>
<td><strong>Opportunities</strong></td>
<td>Ability to reach the world instantaneously with the latest news and technologies.</td>
</tr>
<tr>
<td>-------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Access to courses from a variety of universities.</td>
</tr>
<tr>
<td></td>
<td>Decrease long-term education expenses by shifting learning programs to the Web.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Threats</strong></th>
<th>Lack of student interest.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Equipment and technology requirements restrict adoption of e-learning.</td>
</tr>
<tr>
<td></td>
<td>Lack of human interaction deters the learning process.</td>
</tr>
<tr>
<td></td>
<td>Some topics could be lost in a shorter e-course.</td>
</tr>
</tbody>
</table>
Approaches to e-learning

Self-paced

- Online learning platform
- Learning process not tracked

Instructor-led, facilitated e-learning

- Course or syllabus provided
- E-mails, discussion forums, chats, audio and video conferencing
E-learning components

1. E-learning content
2. E-tutoring
3. E-learning processes
4. Virtual learning environment
# A. E-learning content

## Simple learning resources

- Documents, PowerPoint presentations, videos or audio files.
- Interactive e-lessons;
- Animations, recommended reading and links to online resources
- Electronic simulations: “simulates” the real world, allowing the learner to learn by doing
B) E-tutoring, e-coaching, e-mentoring feedback to learners

(C) E-learning processes chats, discussion forums and blogs, are used for online collaboration among learners.

(D) Virtual learning environment Online learning platform
Synchronous versus asynchronous learning

**Synchronous**
- Chat and Instant Messaging
- Video and audio conference
- Live webcasting
- Whiteboard

**Asynchronous**
- E-mail
- [Discussion board](#)
- Wiki
- Blog
- Webcasting
<table>
<thead>
<tr>
<th>Forum</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oceans in the News</td>
<td>This week, please post a link to a relevant news article related to oceanography or marine biology. This assignment is worth 25 points, and you must post by Monday, Feb. 18 at midnight CT.</td>
</tr>
</tbody>
</table>
| Wave Assignment: Energy From Waves and Tides | Explore harnessing energy from waves and tides. Please narrow your topic to a specific aspect such as:  
- How could the energy be extracted?  
- Could a reliable "model" be made and relied upon?  
- What research is out there?  
- Existing, working energy projects  
This required assignment is **worth 50 points.** |
Instructional systems design model-ADDIE model

**ANALYSIS**
- Needs analysis
- Target audience analysis

**DESIGN**
- Learning objectives
- Instructional strategy
- Delivery strategy
- Evaluation strategy

**DEVELOPMENT**
- Content Development
- Storyboard Development
- Courseware Development

**IMPLEMENTATION**
- Prototype testing

**EVALUATION**
- Reactions
- Learning
- Behaviour
- Results
THE TEAM

• Human resources/Capacity development manager
• Instructional designers (IDs)
• Subject matter experts (SMEs)
• Web developers and media editors
• Course administrators, online facilitators and tutors
• Technical support specialists
Virtual Learning environments (VLE)/Learning Management Systems (LMS)
- integrated suit of software tools and resources/integrated e-learning platform
- provide support and mediation framework for a whole course or program of courses.

MLE (Managed Learning Environments)
- Multiple electronic systems-several VLE, library, assessment, student records
Commercial VLE

Free-moodle

Built in, local

• VLE-Black board, WebCT, Elluminate (www.elluminate.com)
• Known cost, level of ensured interoperability, minimized redundancy
• Logical information architecture supporting real world practice
• User friendly-access easy
• Easily extensible-to meet challenges and changes ahead of time
• Upgradable and adaptable
VLE services

Course outline, Learning content-links to lecture notes, presentations, case studies, videos

Discussion boards/forums
Chat rooms, Blogs, Wikis, Quiz tools

Audio conferencing, videoconferencing, web conferencing

E-learning processes
• Google Apps
  (www.google.com/edu/apps)

• Ipad

• Wiki technology

• Podcasting/Vodcasting - audio and video files streamed directly into students mobiles using a format-Really Simple Syndication (RSS)

http://weblogs.elearning.ubc.ca/googlescholar/podcasting_resources_May8.doc

• Guided-learning modules developed as part of the International Virtual Medical School (IVIMEDS) initiative
Mobile learning

• Use of mobile, hand-held electronic devices in education for accessing content through a VLE
• Personal Digital assistants (PDA), mobile phones
Three current e-learning trends...

- Massive open online course (MOOC)
- Tablet computing
- Learning analytics
Flipped classroom

1. Instructors prerecord lectures

2. Post them online for students to watch on their own

3. Class time used for student-centered learning activities
E-learning is just another tool in the educator’s ever-expanding pedagogical toolbox.

Selection of right tool for the right learner at the right time in the right dose and right route is important.

E-learning may not be superior to traditional methods, but can supplement existing approaches.
It feels good to be lost in the right direction.

• Paul George, Luba Dumenco, Richard Doyle & Richard Dollase (2013). Incorporating iPads into a preclinical curriculum: A pilot study, Medical Teacher, 35:3, 226-230

• Andrew Rasmussen, Melanie Lewis & Jonathan White (2013) The application of wiki technology in medical education, Medical Teacher, 35:2, 109-114)


• Harden & Hart 2002; Sullivan & Harden 2005).