

INFORMATION & COMMUNICATION TECHNOLOGY IN MEDICAL EDUCATION – E-LEARNING

1. Definition of e-learning

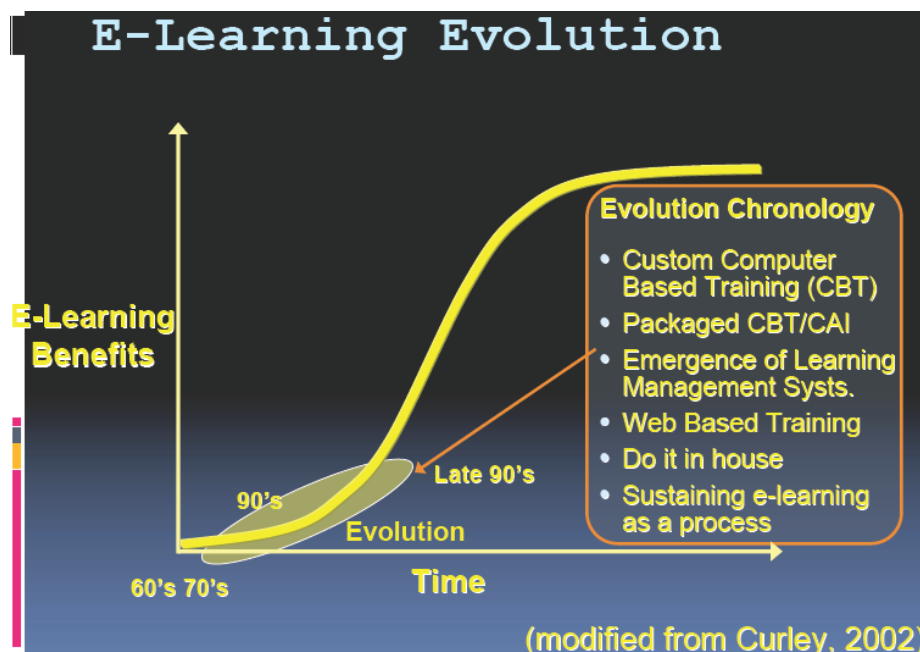
- “The use of technology to **enhance** learning” – Curley, 2003 –
 - Enhance, is:
 - to supplement or complement (content integration) the learning process
 - to enrich course content
 - to support blended learning
 - but not to replace traditional/conventional face to face teaching/learning approach
 - not to spoon-feed learners with learning materials
- “The delivery of learning through **electronic media**” – Harley & Templeman, 2000 –
 - Electronic media or technology, the:
 - Internet
 - Intranet
 - Satellite broadcast
 - Audio-visual
 - Interactive TV
 - CD-ROM, etc...
- “A combination of **content** and **instructional methods** delivered by media elements on a computer intended to **build knowledge** and **skills** linked to individual learning goals and institution performance” – modified from Clark & Mayer, 2003 –
 - Content
 - Learning materials relevant to the learning objective, current and local

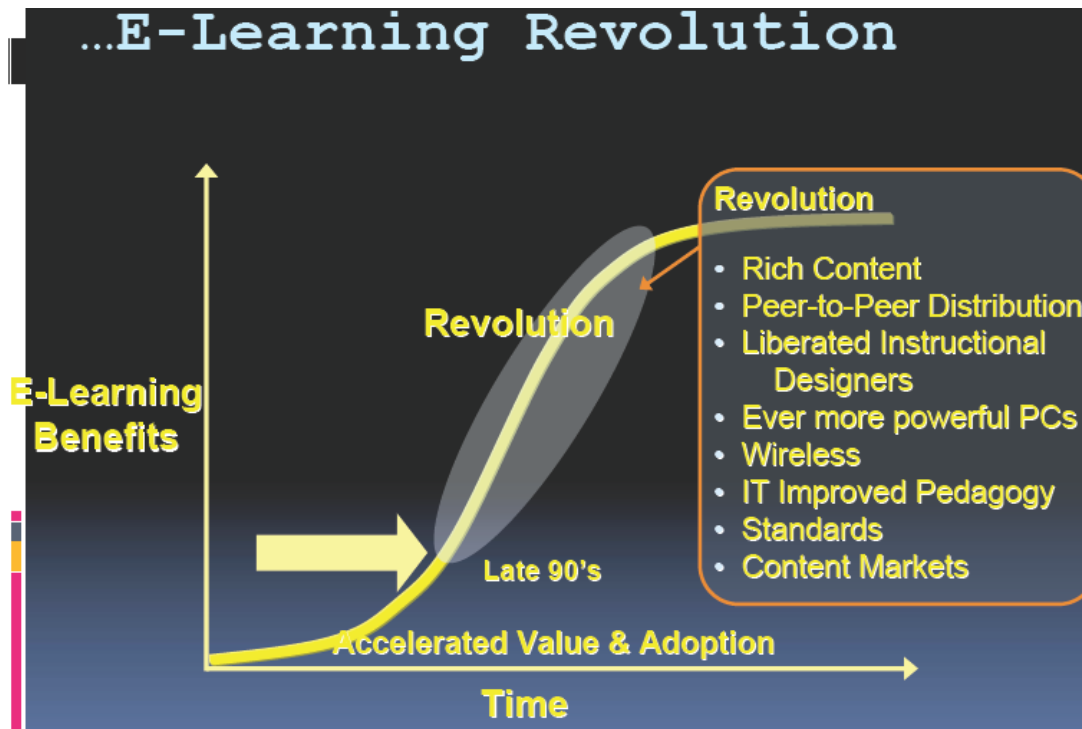
- Instructional methods
 - By example, practice and assessment, to support learning process, an essential ingredient
- Media elements on a computer
 - Digital content in form on text, graphic, audio-video, animation, hyperlink, etc...
- To build knowledge
 - To provide information as in inform courses (theory)
- To build skills
 - To build specific job related skills as in perform courses (practical/clinical)
- Individual learning goals
 - Learner's relate knowledge & skills, at own pace, time place
- Institution performance
 - Environmental factors, technology, cultural and pragmatic constraint
- “E-Learning is a **system of learning** with the help of electronic media to **deliver learning materials** and to **facilitate communication** between instructor and learners. Common e-learning methods uses computers and devices (PDAs, H/P) and sometimes networks to deliver the materials to user at anytime and at any place” – modified from Sitohang & Ferydiansyah, 2003 –
 - System of learning
 - Consist of human, hardware, software (LMS, LCMS & the content, designed based on learning principles and model) and adhere to certain standard of information system delivery
 - Learning materials
 - Facilitate communication
 - Interaction in learning process, i.e. interaction with:
 - Teachers → interactive tutorials/discussion

- Knowledge -> interactive content/materials
- Peers → interactive discussion, collaborative learning
- Oneself → interactive assessments, self-learning

2. Evolution of E-Learning

- E-learning has evolved from distance education
 - 18th century
 - Distance education (US)
 - 19th century
 - Correspondence education (Europe & US)
 - Late 1960's & 70's
 - Development of new media technologies and delivery systems results in significance changes in distance learning.
 - Oxford University (GB) the university to offer college degree through distance education
 - 1990's
 - ICT support education: use of the computer (CBT, CAI) online learning (internet & intranet technologies)
 - Late 1990's
 - Emerging of e-learning concept





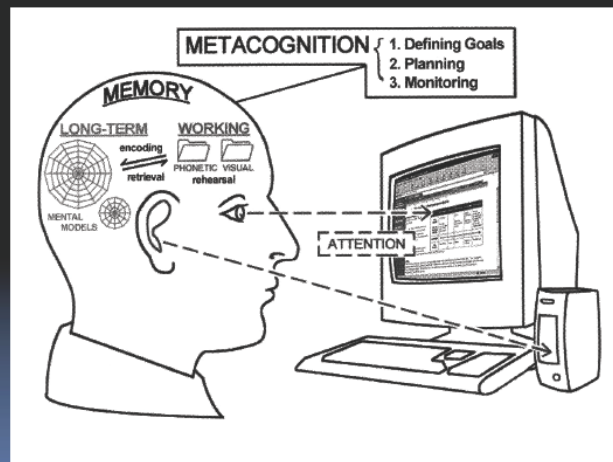
3. Factors that drives e-learning revolution

- Software
 - Internet and intranet allocation that enables information/knowledge dissemination and discoveries
- Hardware
 - Powerful PC's enabling powerful rich content and simulations (experiential learning)
- Networking technology
 - Highbandwidth infrastructure enables multimedia content delivery and video conference session
 - Peer to peer (P2P) technology eliminating bottleneck for cutting edge multimedia
 - Wireless enables anywhere and anytime learning
- Rich content

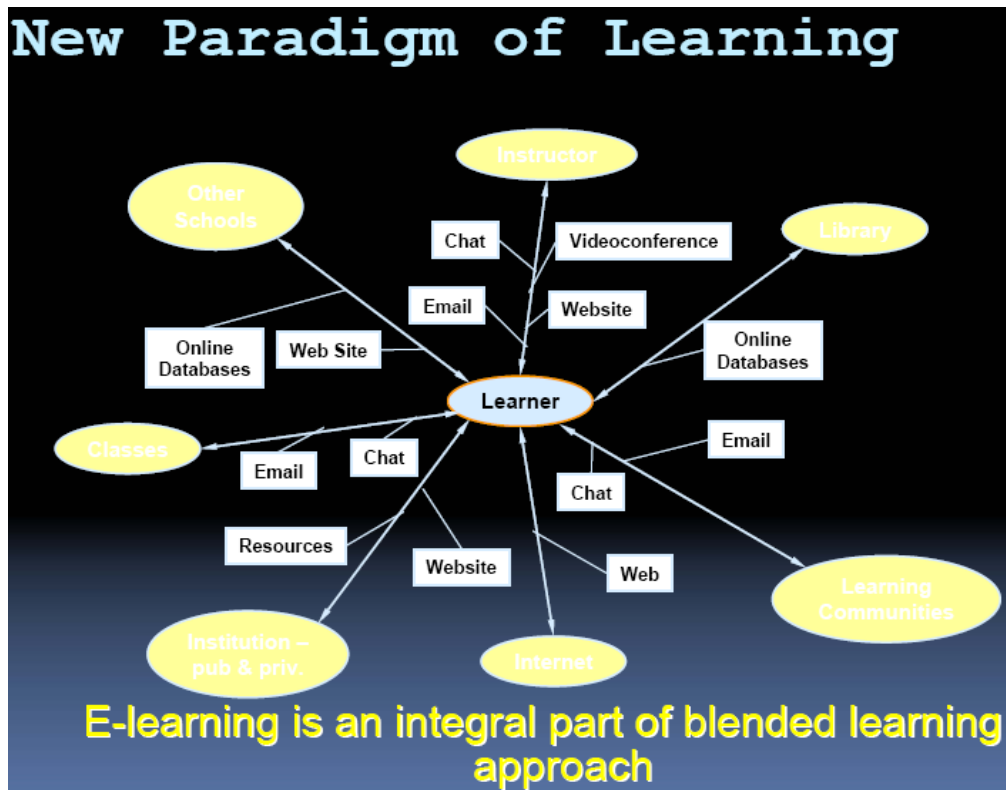
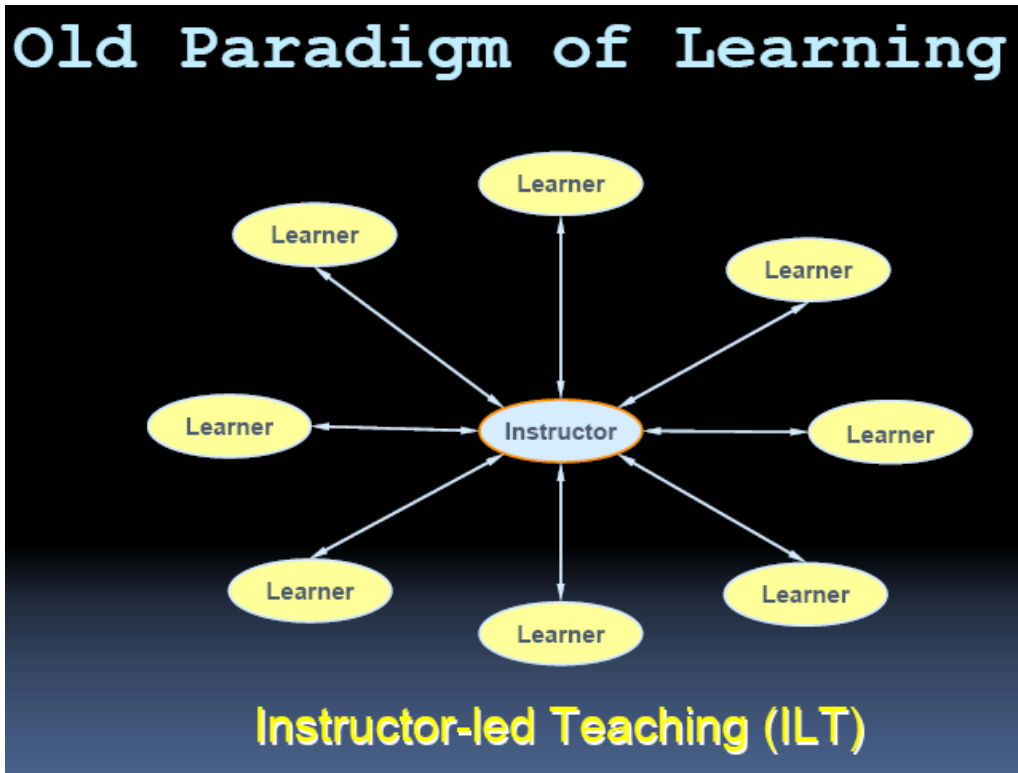
- Uses of technology to blend text, graphics, motion and sounds to deliver knowledge
- Instructional design, which stress on pedagogical aspect can deliver knowledge in a form that enhances understanding and retention by providing content and emphasis
- Can deliver a near face-to-face experience
- How will we benefit from rich content?
 - People remember
 - 20% of what they see
 - 30% of what they hear
 - 50% of what they see and hear
 - 80% of what they see, hear and do simultaneously

- Prof. Fred Hofsteter, Director, Instructional Technology Center
University of Delaware, US -

Cognitive Process Involve in e-Learning



(Clark & Mayer, 2003)



4. New paradigm of learning

- | | | |
|--------------------------|---|--|
| • Teacher | → | • Learner |
| • One-way lecture | → | • Participative lecture |
| • Spoon-feed in class | → | • Self-directed learning |
| • Result-oriented | → | • Process-oriented |
| • Individual achievement | → | • Teamwork achievement
(collaborative learning) |
| • Paper-chase culture | → | • Love for life-long learning |

5. A shift in the learning process.

Teaching face-to-face → Self-instructional Material (SIM)

- SIM is designed to enable students to take control of their own learning (self-directed learning)
- SIM possesses the following features
 - Informing
 - Guiding
 - Motivating
 - Provoking
 - Questioning
 - Assessing
 - Attracting
 - User-friendly

6. Implementation strategies:

- Sufficient and up-to-date infrastructure
- Curriculum, pedagogy and materials
- Teachers and educational management
- Integration at all levels
- Continuous improvement

- Increase virtual content
- E-university concept in all activities at the university
- Retraining and retooling
- Networking
- Commitment from “top”



7. Issues

- Setting up
- Technology issues
- Policy issues
 - National policy
 - Institution policy
- People issues
 - Student learning culture
 - Lecturer teaching culture

- Content provider/subject matter expert
- Developer
- Resource person/system administrator
- Security

8. Conclusion

- E-learning implementation will enhance teaching and learning for the benefits of students
- Heavy investment in IT resources but in long term may save cost compared to classroom training
- Heavy demand on teaching staff to create content for e-learning can be overcome by proper project management
- Success requires commitment and efforts by IT department, top management, teaching staff and students
- Standard of quality need to be addressed, implemented, monitored and upgraded from time to time
- Issues need to be sorted out and problems need