

INTRODUCTION TO ICT IN MEDICAL EDUCATION

1. Topics:

- Trends in medical informatics
- Hospital information system
- E-learning
- Telehealth
- Bioinformatics
- Electronic bibliography
- Implication of ICT in medical education

2. Trends in medical informatics

- Definition of medical informatics
- Relation to health informatics
- Importance and relevance to medicine
 - Education
 - Service
 - Research
- Medical informatics curriculum
- Job description

3. Hospital information system

- Introduction and definition
- Technicality and infrastructures
 - Licensed software
 - Open source
- General concepts and approaches
- Implementation in HUSM
- Current issues and challenges

4. E-learning

- Definition of e-learning
- E-learning – collaborative learning
- E-learning in health care

- E-learning in medical education
- Technicality and infrastructures
- Application and software development
- Trends and current issues

5. Telehealth

- Concept, definition and infrastructures
- Telehealth flagship components
- Medical records and telemedicine
- Scheduling and security
- Telehealth standards and acts
- Telehealth achievements
- Telehealth in HUSM

6. Electronic bibliography

- Definition of electronic bibliography
- References database
- Use of database
 - Writing manuscript of thesis
 - Records

7. Bioinformatics

- Bioinformatics – software application
- Online bioinformatics database
- Data sequence analysis

8. Implication for medical educations

- Computer educational in medical curriculum
 - Training in ICT
 - Information management
- Learning environment and theory
- Computer Assisted Information
- Computer based assessment
- Trends and current issues

ROLES OF ICT IN HEALTH PROFESSION EDUCATION (HPE)

1. Definition:

- ICT (information and communications technology – or technologies) is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as video conferencing and distance learning. ICTs are often spoken of in a particular context, such as ICTs in education, health care, or libraries. < http://searchcio-midmarket.techtarget.com/sDefinition/0,,sid183_gci928405,00.html>
- ICTs are defined as tools that facilitate communication and the processing and transmission of information by electronic means. This definition encompasses the full range of ICTs, from radio and television to telephones (fixed and mobile), computers, and the Internet. (Kerry McNamara, 2007)

2. Gadgets of ICT

- Internet
- Hand phone
- Computer
- LCD
- Email
- Bioinformatics
- E-book
- Wireless Internet
- Video
- Hospital Information system

- Personal Digital Assistant
- Hardware
- Software
- Radio
- Etc...

3. Roles of ICT (Kerry McNamara, 2007):

- Promoting information flow.
- Dissemination of evidence-based knowledge.
- To empower learner/educator.
- Promoting & facilitating discussion and interaction.
- Encouraging sustainable development and governance.
- Improving teaching and learning process.
- Facilitating collaboration and cooperation.

4. Uses of ICT in HPE:

- e-Learning.
- Simulation-Based Medical Education (SBME).
- Virtual learning environment
- m-Learning

5. e-Learning (Dent & Harden, 2008):

- Use of the new electronic technologies including the internet to facilitate learning.
- ICT as an integral part of the overall educational approach, so-called “Blended Learning”.
- Learning is customised or personalised to the needs of the individual learner.
- Learners as part of community of learning.

- Learning made available at the optimal time and place for the learner.

6. Simulation-Based Medical Education (Dent & Harden, 2008):

- Educational activities that utilise simulative aids to enhance the educational message by simulating the clinical scenario, e.g. using simulated or standardized patients & plastic manikin.
- Rationale for SBME are
 - Provides a safe environment for learner to learn.
 - Offers a learner-centred environment.
 - Offers a hands-on educational modalities.
 - Offers opportunities for team training.
 - Provides a reliable, standardised & objective setting for both formative & summative assessment.
 - Increase public trust in medical profession.

7. Virtual Learning Environment (Dent & Harden, 2008):

- An integrated set of online tools, databases & managed resources that exist as a coherent systems, functioning collectively support of education.
- Provide many of the characteristics of a traditional learning environment, however, it balance between online & face-to-face in the essence of the 'blend'.
- E.g. Provide a learning and teaching resources such as searchable study guides & lecture materials, computer-aided learning (CAL) materials, video, discussion board (for mediating online teaching & learning), assessment, students recruitment (registration & payment of fees), assessment feedback & result, etc...
- The strengths of VLEs in medical education are the ability to
 - provide the medium for individuals to interact with a course.

- support personalised learning experiences.
- better manage the logistics of the learning process.
- better manage the administration of the learning process.
- support and extend the essence of a community of practice.
- support audit & quality assurance & create a course 'knowledge base'.
- provide integration with other system either within or beyond the institution as gateways to repositories and collection of third-party resources.

8. m-learning (Sharples et al., 2005):

- Theory of mobile learning:
- starts from assumption that learners are continually on the move, so-called "The mobility of learners & learning".
- must therefore embrace the considerable learning that occurs outside classrooms and lecture halls as people initiate and structure their activities to enable educational processes and outcomes.
- must be based on contemporary accounts of practices that enable successful learning.
- must take account of the ubiquitous use of personal and shared technology.
- The strengths of mobile learning:
 - Learning is mediated by knowledge & technologies as instrument for productive enquiry, in a mutually supportive & dynamically changing relationship.
 - The mediation can be analysed from a technological perspective of human-computer interaction, physical context and digital communication, and from a human perspective of social conventions, community, conversation and division of

labour. These two perspectives interact to promote a co-evolution of learning and technology.

9. ICT implementation strategies

- *Accessibility*: facilitate easy and quick access to ICT-rich teaching and learning resources including ICT systems and services, computing resources, online learning materials, e-Learning, and other education centred applications
- *Empowerment*: empower educational communities with ICT technologies and continuously upgrade their ICT-driven teaching and learning skills
- *eLearning*: encourage the use of eLearning and adoption of its tools and technologies to facilitate widening access to learning and improving educational achievements
- *Enabling environment*: facilitate the establishment of stable, robust, secure and efficient ICT enabling environment and strengthening its availability and reliability and providing mobile and remote access to a repository of learning resources
- *Learning and teaching methodologies*: enhance learning and teaching methodologies through the use of ICT technologies and encouraging education-centred teaching mechanisms
- *Lifelong learning*: develop a framework for web enabled lifelong learning through continuous education and training
- *Research and development*: promote innovation culture and encourage applied research and development among communities for advanced forms of education and learning processes
- *Policy*: Develop legal, policy, and regulatory frameworks to promote competition and investments, protect intellectual property, and stimulate innovation
- *Sharing and dissemination*: on the worldwide web, provide forums, publications, and free space for ICT companies and stakeholders to share and disseminate accumulated knowledge, information, experiences, and products and services related to ICTs in education
- *Sustainability*: maintain a constant pace of development to sustain and reproduce knowledge for a continuing effort on ICTs in Education to meet new demands

< <http://ictsineducation.tagcb.edu.jo/> >

10. ICT constraints & challenges (Kerry McNamara, 2007):

- Connectivity
- Content
- Capacity
- Community
- Commerce
- Culture
- Cooperation

- Capital

11. ICT impacts on HPE (Kerry McNamara, 2007; Dent & Harden, 2008):

- Positive impacts
 - Evidence-based knowledge
 - Improving educational modalities
 - Customised & personalised learning
 - Promote collaborative learning
- Negative impacts
 - Plagiarism
 - Copyright issues
 - Increase workload to administrators & teachers.