

Computer in Health/Medical Education

Dr. Nasriah Zakaria

nzakaria@ksu.edu.sa

Reality of Healthcare

- **Multidisciplinary team**
- **Constant learning**
- **Information Rich Environment**
- **Provide high quality care**

Healthcare Education

1. Problem-based learning , Case-based learning

2. Content

- **Physiological processes**
- **Procedures, Effects of Intervention**
- **Soft skills (interpersonal skills, leadership ethics)**
- **Information & Communication Technology(ICT) skills (basic Office, library database, smart phone Apps)**

Healthcare Education

3. Teaching Strategies

- **One-way lecture based**
- **Two-way interactive (Computer-based, e-learning)**
- **Online**

4. Assessment Methods

- **Multiple choice Questions (Midterm, Final)**
- **Short answers**
- **Assignment**
- **Project**
- **Presentation**

Theories of Learning

Behaviorism

- How one learn by looking at the observable behaviour
- Based on stimuli and responses
- Not all process of learning can be measured (such as understanding, reasoning)

Cognitive Science

- the process of learning is based on thinking
- Mind is information processing system
- Learning is permanent change in cognition
- brain is no longer black box, it is a dynamic system

Constructivism

- learning process through interaction
- problem-based learning (PBL)
- arriving to solution given the knowledge available

Advantages of Using Computers in ME

- **Extending Storage**

Google Drive

Drop box

- **Access to References**

Saudi Digital Library

Pubmed

British Medical Journal (BMJ)

Clinical Key

Up to Date (<http://www.uptodate.com/home/help-demo>)

Advantages of Using Computers in ME

- **Access to new content**

Forums

Meducation (www.meducation.net)

Patient Cases

**Patientslikeme ([http://
www.patientslikeme.com/about](http://www.patientslikeme.com/about))**

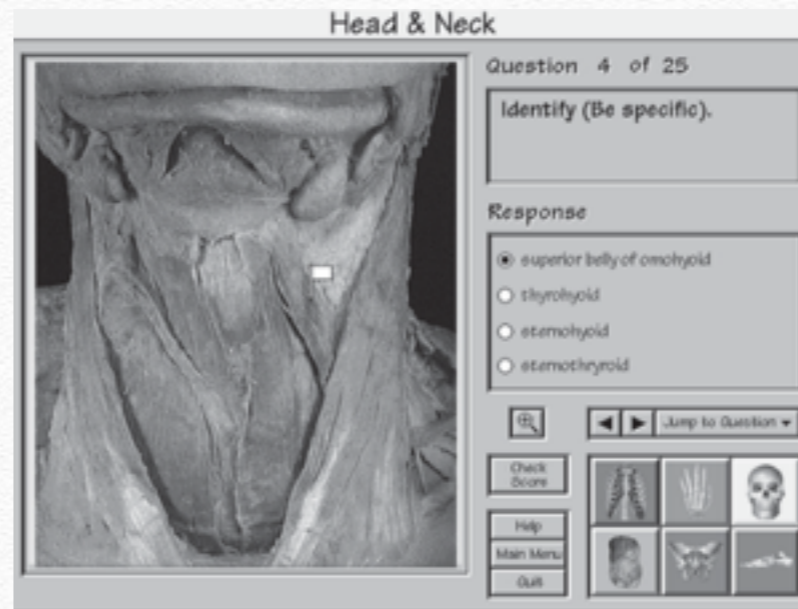
Mode of Computer-based learning

- **Student needs references to facts and knowledge**
- **Must know how to apply to form diagnostic hypothesis & plan therapies**
- **Computer is used for a wide range of learning methods- from drilling students to allowing student to explore a body of material**

Mode of Computer-based learning

Drill and Practice

- Present material to students
- Answer MCQ
- Repeat till mastery
- Move to the next material



Advantages: Student can learn factual material

Allow everyone to learn on their own pace without needing one to one guidance

Mode of Computer-based learning

Didactic: Lecture

- **Traditional teacher-centred learning**
- **Lecture based**
- **Students only passive participants**

Digital Lecture

- **Recorded and broadcast to students**
- **Podcast, Webinars**
- **Other media: Youtube, Slideshare**
- **Open Courseware by MIT (2001) can be shared across partner universities**

Mode of Computer-based learning

- **Discrimination Learning : Process of teaching student to differentiate between the different clinical manifestations**
- **Computer help to detect the subtle difference**

Red rash vs. Inflammation on Dermatologic lesion

Mode of Computer-based learning

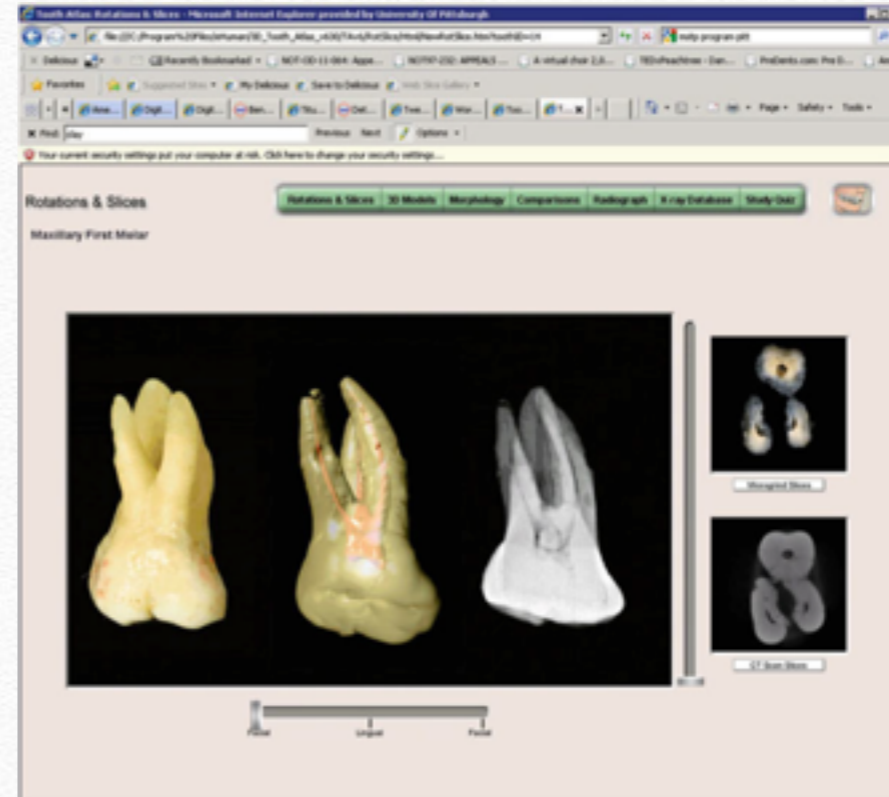
- **Exploration: students have the freedom to explore without guidance and interruptions**

Brain structure- explore the images, observing the location, size of structure change

- **Advantage: Encouraged self-discovery and experimentation**
- **Disadvantage- Without guidance, students may be lost (do not meet learning objectives) and wasting time**

Mode of Computer-based learning

- **Exploration**



- **Tooth Atlas**
- **Exploring dental anatomy**
- **3D model and radiographs**

Mode of Computer-based learning

- **Construction: use computer program to reconstructing the human body**

Putting together the separated parts of body or placing cross sections at the correct location in the body

- **Effective learning using constructive approach to learning**

Mode of Computer-based learning



Simulation



Mode of Computer-based learning

- **Simulation**
 - Engage and actively involved in decision making
 - **Interaction between a student and a simulated patient**
 - Approximate the real-world experience of patient care
 - Put attention to subject being presented
 - Simulation can be static vs dynamic
 - Static- predefined problems and clinical outcomes
 - Dynamic- simulate changes as students are interacting; make students understand their actions and clinical outcomes
- **Effective learning using constructive approach to learning**

Reference

Shortliffe, E. H., & Cimino, J. J. (2014). *Biomedical Informatics: Computer applications in health care and biomedicine*, Springer