Problem-Based Learning via the Web: Supporting Student Collaboration & Instructor’s Presence

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issues & challenges

- ever expanding medical & biomedical information
- overspecialization in disciplines and, thus, teachers
- a need to move from disease-based towards a patient centered approach
trends & approaches

- alternative medical education approaches:
  - active, self-directed, student-centered, experiential, learning
  - problem/case/task/inquiry/role... based learning

- supporting actions:
  - information technologies to harness information explosion and support teaching
active vs. traditional learning

- students discover information and attain knowledge on their own
- students collaborate to achieve knowledge
- enhanced and interactive teacher presence to facilitate inquiry and guide search
- usually, interdisciplinary approach at each learning episode
- continuous evaluation

- teachers produce information via lectures and specific textbooks
- students attend and study to achieve knowledge
- regular teacher lecturing to present information
- usually, monodisciplinary approach at each lecture
- final (or in steps) evaluation
trends & approaches

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- supporting actions:
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information technology

- information dissemination
  - electronic textbooks, atlases, medical & biological databases, scientific press, ...

- achieving knowledge & understanding
  - creation, management and dissemination of digital teaching file collections (e.g. VPs)
  - self-evaluation tools and processes
  - mediation of teacher-learner exchange
what about …

using new technologies to support active learning?

- offer mechanisms for personal inquiry
- support collaboration
- ensure instructor’s presence
- provide mechanisms for continuous monitoring and evaluation

internet & the web
web 2.0
Web 2.0

web 1.0
- user as a recipient
- publishing
- scripted content
- user contribution can be a chore
- software irrelevant of the user
- rigid software solutions
- publishing & linking data

web 2.0
- user as a contributor
- participation
- emergent behavior
- user contribution transparently aggregated
- software improved through user participation
- open-ended customizable modular technologies
- harnessing collective intelligence
### Web 2.0 by example

<table>
<thead>
<tr>
<th>Web services</th>
<th>Modular open ended modifiable software</th>
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<tbody>
<tr>
<td>P2P sharing</td>
<td>Decentralized resources, gets better the more people use it</td>
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<tr>
<td>Blogs</td>
<td>Reinforces participation, collaboration and community making</td>
</tr>
<tr>
<td>Wikis</td>
<td>Reinforces participation, easily aggregates user contribution</td>
</tr>
</tbody>
</table>
supporting active learning

for example, problem based learning

- develop problem in a wiki – various teachers can collaborate
- initiate discussion via problem’s blog/forum
- student search via the web (and not only)
- students collaborate to solve the case via wiki
- student activities & progress are recorded and commended on in personal blogs
- the entire process and all its steps are recorded and monitored via wiki and blogs
IntraMEDnet: A Mediterranean Research and Higher Education Intranet in Medical and Biological Sciences

- 2006-2007
- DUTH Scientific Coordinator: E. Kaldoudi
- ~1.200.000 M€

R&D grant under:
- INTERREG III B ARCHIMED
- EU Community Initiative
- Co-financing by
- European Regional Development Fund (ERDF)
IntraMEDnet

- develop individual educational modules
- self contained educational units
- well specified educational objectives
- thematically targeted and overspecialized
- developed by overspecialized experts in the specific thematic area
IntraMEDnet

additionally,

support problem/based learning

- collaboration of various experts for disparate institutions
- remote teaching of students

using

open source learning/course management systems
IntraMEDnet

based on moodle LMS

http://iris.med.duth.gr/elearning/
School of Medicine - DUTH

Τμήματα

IntraMEDnet Educational Material 4
PBL Problems 1

Αναζήτηση μαθημάτων: Go

Διαθέσιμα Μαθήματα

Molecular Imaging: Overview and Physical Principles
Course creator: Eleni Kaldoudi
An introduction to the physics of molecular imaging techniques.

Introduction to Gene Therapy (in Greek)
School of Medicine - DUTH

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DICOM Basics

This wiki is devoted for PBL sessions on DICOM basics.

Each problem is presented in a number of sequential steps.

The students are expected to read through the first step, and discuss it via the problem's blog. Then, they should set out to find the answers to the questions asked in this Step 1, as well as answer all other questions that have been raised during the blog discussion. They have to record important steps of their search in their personal blogs. Finally, they have to provide answers collaboratively in the wiki (in "edit" mode, include a word in square brackets [...] to create a new page).

A subsequent step of the Problem Statement will be deployed once the previous one is completed.

Medical Image Basics - DICOM

Problem Statement - Step 1: Sending out images acquired on a medical scanner
Medical Image Basics - DICOM

Problem Statement - Step 1: Sending out images acquired on a medical scanner

Problem Statement - Step 2?

Problem Statement - Step 3?

Conclusion?

The following paragraphs and links there in comprise the results of this PBL session outcomes as developed by the students.

DICOM Basics

You are logged in as IntraMEDnet Project (Logout)
DICOM Basics.

Problem Statement - Step 1: Sending out images acquired on a medical scanner.

A rural diagnostic clinic establishes a collaboration with the Medical Informatics Department of the University in the region’s capital city, some 120 Km away. The ultimate goal is to have brain MRI images postprocessed in order to accurately measure lesion volumes for accessing therapy and surgery results.

During the collaboration protocol set up, the radiologist in charge is asked to send MRI brain images by email to the Medical Image Processing Lab of the University.

Since no further instructions are given, the radiologist struggles for some time with the MRI scanner software. At some point he discovers under the “send” menu, a list of acronyms “jpeg”, “jpeg2000”, “png”, “tiff”, “bmp” and the obscure “DICOM AE”.

He immediately recognises “jpeg” as the extension image files on the web usually have, and proceeds to export the pilot image in jpg and email it to his collaborators.

Questions/Suggestions:

1) Identify and explain all unknown terms in the text.

2) Give a definition and explain in more details all the acronyms under the “send” menu

3) Did the radiologist choose correctly, and why?

Note: in order to provide the definition and analysis for each unknown term, create a new wiki page in the initial page, putting the desired term in square brackets, e.g. MRI
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The Operational Programme for Education and Initial Vocational Training
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Co-financed by the European Regional Development Fund (ERDF)

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