



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

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December 2007

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

- alternative medical education approaches:
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 - ↪ information technologies to harness information explosion and support teaching

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 ⇒ internet & the web
- support collaboration ?
- ensure instructor's presence ? web 2.0
- provide mechanisms for continuous monitoring and evaluation ?

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

- | | |
|---------------------|--|
| Web services | Modular open ended modifiable software |
| P2P sharing | Decentralized resources, gets better the more people use it |
| Blogs | Reinforces participation, collaboration and community making |
| Wikis | Reinforces participation, easily aggregates user contribution |

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

Project IntraMEDnet

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/>

The screenshot shows a web browser window titled "School of Medicine - DUTH - Windows Internet Explorer". The address bar shows the URL "http://iris.med.duth.gr/elearning/". The page content includes:

- School of Medicine - DUTH** header with a language selector set to "Ελληνικά (el)".
- Τμήματα** (Departments) section listing:
 - IntraMEDnet Educational Material: 4
 - PBL Problems: 1
- A search box with the text "Αναζήτηση μαθημάτων:" and a "Go" button.
- Διαθέσιμα Μαθήματα** (Available Courses) section:
 - [Molecular Imaging: Overview and Physical Principles](#)
 - Course creator: Eleni Kaldoudi
 - [Introduction to Gene Therapy \(in greek\)](#)
- Ημερολόγιο** (Calendar) for December 2007, showing a grid with the 14th highlighted.
- Footer text:** "Website for the support of educational activities in the School of Medicine, Democritus University of Thrace, Greece. It is based on the open source moodle course management system. The website provides pilot"

School of Medicine - DUTH

Δεν έχετε εισέλθει. (Είσοδος)

Ελληνικά (el)

Ιστοχώρος για την διαδικτυακή υποστήριξη της εκπαίδευσης στο Τμήμα Ιατρικής, Δημοκρίτειο Πανεπιστήμιο Θράκης. Βασίζεται στο ανοικτού κώδικα ολοκληρωμένο σύστημα για διαχείριση μαθημάτων moodle. Ο ιστοχώρος λειτουργεί δοκιμαστικά για ορισμένα μόνο μαθήματα, καθώς αποτελεί την δεύτερη έκδοση του Ηλεκτρονικού Μαυροπίνακα, που για την ώρα λειτουργεί σε άλλη διεύθυνση.

Website for the support of educational activities in the School of Medicine, Democritus University of Thrace, Greece. It is based on the open source moodle course management system. The website provides pilot

Τμήματα

IntraMEDnet Educational Material 4
PBL Problems 1

Αναζήτηση μαθημάτων:

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 \(in greek\)](#)

Ημερολόγιο

◀ Δεκέμβριος 2007 ▶

Κυρ	Δευ	Τρι	Τετ	Πεμ	Παρ	Σαβ
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

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[←](#) [→](#) <http://iris.med.duth.gr/elearning/course/view.php?id=2>

File >> [Google](#) [Popups okay](#) [AutoLink](#) [AutoFill](#) [Settings](#) [Links](#) >>

[★](#) [★](#) [☰](#) [Course: DICOM Basics](#) [×](#) [Biomedical Engineering Unit - ...](#) [🏠](#) [📡](#) [🖨️](#) [📄](#) [Page](#) [⚙️](#) [Tools](#) >>

DICOM Basics

You are logged in as [IntraMEDnet Project](#) (Logout)

[DUTH mEducator](#) ▶ [PBL: DICOM](#)

People

[👤 Participants](#)

Administration

[📊 Grades](#)

My courses

Topic outline

[👤 News forum](#)

1 [🏠 DICOM Basics](#)

2 Not available

Blog Menu

- [Add a new entry](#)
- [View my entries](#)
- [Blog preferences](#)
- [View course entries](#)
- [View site entries](#)
- [Add/delete tags ...](#)

Latest News

Upcoming Events

Recent Activity

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http://iris.med.duth.gr/elearning/mod/wiki/view.php?id=8

File >> Google G Go Popups okay AutoLink AutoFill Settings Links >>

PBL: DICOM: Medical Ima... Biomedical Engineering Unit - ...

Page Tools >>

DICOM Basics

Jump to...

[DUTH mEducator](#) > [PBL: DICOM](#) > [Wikis](#) > [DICOM Basics](#) > [Medical Image Basics - DICOM](#)

Search Wiki:

-- Choose Wiki Links --

-- Administration --

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.

View

Edit

Links

History

Reload this page

Medical Image Basics - DICOM

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

[View](#) [Edit](#) [Links](#) [History](#)

[Reload this page](#)

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)

PBL: DICOM

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](#)

work partly funded within the projects:

Reforming Undergraduate Medical Curriculum in the School of
Medicine - DUTH

The Operational Programme for
Education and Initial Vocational Training

Ministry of National Education & Religious Affairs and the
European Community

Co-financed by
the European Regional Development Fund (ERDF)



Programme INTERREG III B
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Sharing a common sea, Shaping a common future



IntraMEDnet: A Mediterranean Research and Higher
Education Intranet in Medical and Biological Sciences
INTERREG III B ARCHIMED

EU Community Initiative
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cite as

E. Kaldoudi, "Problem-Based Learning via the Web - Supporting Student Collaboration and Instructor's Presence", International Workshop on "Medical Education: Current Trends and Challenges", Alexandroupolis, December 14-15, 2007