Problem-Based Learning using Web 2.0

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facts & challenges in medical education

facts:
- medical and biomedical information & knowledge (basic & core) is ever expanding
- medical disciplines become increasingly overspecialized
- medical educators become increasingly overspecialized

challenges:
- how to provide expert knowledge in remote institutions
- how to provide more audience to overspecialized educators located at remote institutions
- how to communicate and exchange (not only knowledge but also) expertise in skills and competences
contemporary medical education

trends & approaches

- alternative medical education methodologies:
  - active, self-directed, student-centered, experiential, learning (attainment of both knowledge & skills)
  - problem/case/task/inquiry/role/game/... based learning

- technological support:
  - information technologies to harness information explosion and support teaching and e-learning
our approach

IntraMEDnet & WideMEDnet

use information technology to support medical academic institutions across Europe to exchange:

- overspecialized educational material
- overspecialized expert instruction
sharing medical educational material

develop and share individual educational modules

- self contained educational units
- with well specified educational objectives
- thematically targeted and overspecialized
- developed by overspecialized experts
- available for sharing over the web
sharing medical educational material

- complex educational module
  - text, presentation, exams, discussion, video, chart, evidence based data, VPs, algorithms, games, etc

- detailed descriptive information for each module
  - author - copyright - life cycle
  - educational goals, outcomes, content, teaching methods, workload, etc
  - context, instructions of use

- offered via generic, web-based, Learning Management Systems (LMS)
current approach

isolated servers & manual search/retrieve

partner institute 1
partner institute 2
partner institute 3
partner institute 4
partner institute 5
work in progress

service oriented federated architecture

partner institute 1

partner institute 2

partner institute 3

partner institute 4

partner institute 5
however...

expert instruction is also an asset to be shared!!!

thus, we should strive to support:

- remote instruction of students in active learning
- collaboration of remote experts for active learning sessions development and deployment
- monitoring of students’ progress in attaining skills and competences
problem based learning (PBL)

PBL: a representative example of active learning, widely used in medical education

“PBL is focused, experiential learning organized around the investigation, explanation, and resolution of meaningful problems”

H. Silver, Problem-Based Learning: What and How Do Students Learn?
Educational Psychology Review, 16; 3 (2004)
problem based learning (PBL)

- learner group
  - self directed towards learning resources
  - self regulated regarding depth and breadth of inquiry
  - collaborating to bring together diverse knowledge
  - largely independent of teacher

- didactic problem
  - ill structured, open-ended & complex to motivate

- instructor/facilitator
  - expert educator
  - guides & challenges learners instead of providing knowledge
  - promotes collaboration
PBL support requires ...

- mechanisms for personal inquiry
  ⇒ internet & the web

- support for student collaboration

- support for instructor’s presence & collaboration
  ⇒ web 2.0

- mechanisms for continuous monitoring, evaluation & guidance
web 1.0 → 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

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

...
problem based learning via web 2.0

- develop educational problem in a wiki - various remote teachers can collaborate
- initiate discussion via problem's blog/forum
- students search for solution/knowledge via the web (and not only)
- students collaborate to solve the case via wikis
- activities & progress in achieving scientific competences & skills are recorded & discussed in personal students' blogs
- teachers' experiences are recorded & discussed in personal teachers' blogs
problem based learning via web 2.0

http://iris.med.duth.gr/elearning/

based on moodle LMS

http://www.moodle.org
PBL session on the DICOM standard

- developed & delivered by educators from 2 different Universities
- for MSc students in Medical Informatics
  - at least 3 educators
  - groups of ~7 students

eLearning in Medicine - Nicosia - Nov 15, 2008
PBL session on Biophysics
(the origin of chemical elements and much more)

- developed & delivered by 3 educators, 2 of them associate researchers
- for 1st year MBG students and the public
- groups of ~8 students
PBL session on Biophysics (the origin of chemical elements and much more)

- as an introduction to nuclear physics and the origin of chemical elements
- as an initial experience in critical literature research
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<th>PARTICIPANT</th>
<th>Prior Knowledge</th>
<th>Expected Difficulty</th>
<th>Expectations</th>
<th>Fears</th>
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participants’ view about PBL before the session
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participants’ view about the elearning platform before the session
### Participants’ view about the elearning platform after the session

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<th>PARTICIPANT</th>
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Participants' view about the elearning platform after the session.
initial feedback ...

- encourage discussions on background issues (PBL, web2.0, etc)
- allow a test period (play around with the environment) and require input from all
- give clear rules of engagement
- break down assignments - impose hard deadlines
- require minimum no. for individual blog/wiki/forum entries
- require discussions for wiki entries
- require regular teacher input (comments on blogs and forums)
problem based learning via web 2.0

- **wiki**
  - develop the problem (teacher collaboration)
  - develop the solution (student collaboration)

- **forum**
  - discuss practical issues & background
  - present/discuss the procedure
  - discuss/analyze the problem

- **blog**
  - record/comment on personal experience
  - record/comment on progress/competencies
work in progress

- deploy to a number of groups & various PBL sessions
- assess user acceptance (students & teachers)
- evaluate against conventional PBL
- elaborate on ways to analyze the learning process as recorded in personal blogs
  - capture experts’ skills
  - access students’ progress in terms of skills and competences (not only knowledge)
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)

IntraMEDnet & WideMEDnet
INTERREG III B ARCHIMED
EU Community Initiative
Co-financing by the European Regional Development Fund (ERDF)
cite as

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