Collaborative E-learning in AHyCo
Online Learning System

Nataša Hoić–Božić
natasa.hoic@ri.t-com.hr
University of Rijeka (Croatia)

Agenda

- Introduction: E-learning
- Collaborative online learning
- E-learning with AHyCo
- Online collaboration support and communication in AHyCo
- Using AHyCo system for learning
- Results
What is e-learning?

- Different definitions of e-learning:
  - "**Techno-oriented**": emphasis is on "e-" (electronic):
    "E-learning is any kind of learning, training or education that is enhanced by the use of information and communication technologies (ICT)."
  - "**Pedagogical-oriented**": emphasis is on learning
    "E-learning is an interactive process between teacher and the learner through the electronic media."

E-learning continuum

- E-learning as a continuum of teaching:

Source: CARNet E-Learning Academy - ELA learning materials
E-learning vs. distance learning

- E-learning is not the same as distance learning:

![Diagram showing overlap between e-learning and online learning vs distance learning]

Basic e-learning approaches

- **Blended (mix-mode)** learning: some face-to-face (f2f) elements are replaced by technology mediated teaching
- **Pure e-learning**
  - asynchronous (e.g. web courseware, email)
  - synchronous (e.g. videoconferences)
E–learning today

- Interactive learning and teaching using WWW
  - WWW - primary delivery mode of presentation and communication (Computer mediated communication – CMC)

Problems
- Providing information on WWW not the same as teaching
- Focus set on content delivery, not on the learning process
- High drop out rate (up to 35%)

Solving some of the problems

- Increase social interaction
  - Nowadays, communication is limited to:
    - Interaction between students and content
    - Interaction between student and tutor
  - Interaction between students should be increased as well
    - Involve well prepared both students and tutors

- CMC and collaborative activities
Collaborative online learning

**Definition:** “Students of different abilities work together in small groups to solve a problem or complete a project”

It includes:
- Group activities
- Active participation
- Interaction and communication

Interaction and work through well established “ground rules”

Group work

Group work is organized into several stages:
- Initial stage – group forming
- Distribution of group tasks
- Autonomous group work
- Presentation of results
- Evaluation of group work

Teachers should pay special attention to students when working online
- Physical and psychological separation
E-learning with AHyCo

- Adaptive Hypermedia Courseware
- Adaptive hypermedia learning management system
- Main features
  - Based on hypermedia
  - **domain model** - describes the structure of the learning domain as a set of concepts linked together with prerequisite relationships
  - **student model** - encompasses student's knowledge of learning concepts
  - **adaptive model** - contains rules for adaptation

Domain model in AHyCo

- describes the structure of the learning domain
- Two-level structure:
  - Graph of concepts (lessons $C_i$ and tests $T_j$)
  - Graph of modules $M_k \rightarrow$ course
- Prerequisite relationship $C_i \prec C_j$
  - “concept $C_i$ should be learned before concept $C_j$”
Student and adaptation model

- Two-level student model:
  - 1st level estimates students' knowledge $k_i$ about the lesson $C_i$
  - 2nd level estimates the knowledge $km_k$ about the module $M_k$

- Adaptation model
  - Adaptation rules - define how are the domain model and the student model combined together to support students' adaptive navigation through the course

Collaboration support and communication in AHyCo

- Adaptive group formation
- Asynchronous communication using multi–threaded forum
- File sharing module
- Group to group grading and evaluation
Adaptive group formation

- Dividing students into groups depending on their learning success:
  - Knowledge levels $k_i$ about the lesson $C_i$ and $km_k$ about the module
- Other group forming parameters:
  - Grades from previous courses
  - Group's size
  - Student's personal data
  - Teacher's preferences
Asynchronous CMC in AhyCo

- Learning "anyplace and anytime"

- Forum
  - Each participant has enough time to think about conversations and to make thoughtful contributions
  - A record of the interaction is kept and can be reused

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File sharing module

File sharing between group members
Group grading and evaluation

- Interface with the given set of criteria:

<table>
<thead>
<tr>
<th>Grading Criteria</th>
<th>Grade</th>
<th>Average grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form &amp; storyboard</td>
<td>0/5</td>
<td>0.00/5</td>
</tr>
<tr>
<td>Implementation and quality of required elements</td>
<td>0/5</td>
<td>4.50/5</td>
</tr>
<tr>
<td>General coverage and assignment coverage</td>
<td>0/4</td>
<td>4.00/4</td>
</tr>
<tr>
<td>Design</td>
<td>0/4</td>
<td>3.50/4</td>
</tr>
<tr>
<td>Interface design</td>
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<td>4.00/4</td>
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<tr>
<td>Navigation design</td>
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<td>4.00/4</td>
</tr>
<tr>
<td>Additional elements</td>
<td>0/4</td>
<td>4.00/4</td>
</tr>
</tbody>
</table>

Using AHyCo for learning

- Blended e-learning approach for the course "Teaching Methods in Information Science"

- Course activities:
  1. **Presenting** course’s content (f2f, AHyCo adaptive courseware)
  2. Students’ **seminar papers** (f2f, AHyCo test)
  3. Online **discussion** (AHyCo forum)
  4. Development of **WWW courseware** (group work partly using AHyCo)
  5. Courseware **reflection** (f2f, AHyCo peer evaluation module)
Learning paradigms in AHyCo

- AHyCo combines three theories of learning:
  - Behaviourism
    - Online learning and testing
  - Cognistivistic paradigm
    - Forum discussions
    - Free choice of topic for the WWW courseware
    - Reflection on work
  - Constructivism
    - Online interaction with teachers, other students and the content
    - Collaborative learning - working in groups

Results

- All students passed the exam in July
  - Average mark 3.68 (the range is from 1-5)
  - Collaborative online learning requires continuous active participation during the academic year
- Questionnaire about the students' attitude concerning online collaborative learning
  - Some preliminary results: most of the students accepted the new way of learning with AHyCo system quite well