Title Presentation

Sub-title Sub-title

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Open University of the Netherlands
RecSys 2008, Lausanne
Informal Learning Activities

Laura speaks Dutch

Laura speaks Dutch #50: Koninginnedag

In this episode we are celebrating Queens Day! We celebrate that on April 30th. You want to know why? Well listen! A very traditional episode. Read on for the lesson.
Learning Networks

- Explicitly address informal learning

- Learners can publish, share, rate, tag and adjust their own Learning Activities (LAs) in a Learning Network

- Open Corpus that emerges form the bottom upwards
**Recommendation Goal and Task**

**Recommendation Goals**
1. Make recommendations pedagogical appropriate
2. Suggesting emerging learning path to learners

**Recommendation Tasks**
1. Find appropriate Items
2. Recommend Sequence

**Environmental Conditions**
1. Emerging structure through tags and ratings
2. No maintenance available
## Evaluation Criteria

<table>
<thead>
<tr>
<th>Measurements</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Technical measures</strong></td>
<td>1. Accuracy</td>
</tr>
<tr>
<td></td>
<td>2. Precision</td>
</tr>
<tr>
<td></td>
<td>3. Recall</td>
</tr>
<tr>
<td><strong>Educational measures</strong></td>
<td>1. Effectiveness</td>
</tr>
<tr>
<td></td>
<td>2. Efficiency</td>
</tr>
<tr>
<td></td>
<td>3. Satisfaction</td>
</tr>
<tr>
<td></td>
<td>4. Drop out rate</td>
</tr>
<tr>
<td><strong>Social Network measures</strong></td>
<td>1. Variety</td>
</tr>
<tr>
<td></td>
<td>2. Centrality</td>
</tr>
<tr>
<td></td>
<td>3. Closeness</td>
</tr>
<tr>
<td></td>
<td>4. Cohesion</td>
</tr>
</tbody>
</table>

[Drachsler, accepted]
Project Milestones

study 1: [Psychology pilot]
collaborative filtering + ontology

study 2: [Multi-agent simulation environment]
collaborative filtering + implicit ratings

study 3: [Open Educational Resource pilot]
collaborative filtering + tagging + implicit and explicit rating

R3 for LN
### Overview of learning activities

<table>
<thead>
<tr>
<th>You already completed:</th>
<th>Activities you are enrolled into:</th>
<th>You still need to complete:</th>
</tr>
</thead>
</table>
| You have not completed any learning activity. | Perception  
Personality  
Awareness  
Changes during the lifetime  
Therapies  
Language | Behavior and health  
Thinking  
Social Psychology  
Conditioning and learning  
Abnormal psychology  
Recall and neglect  
Intelligence  
The biology of behavior  
Motivation and emotions  
Attention and awareness  
Applied Psychology |

Based on your study interest in "cognition" (mentioned in your personal profile), we suggest to further study the following learning activity:

<table>
<thead>
<tr>
<th>Title of the suggested learning activity</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thinking</td>
<td>description of the recommendation</td>
</tr>
</tbody>
</table>
ISIS / Hypothesis

1. The experimental groups will be able to complete more LAs than the control group (Effectiveness).

2. The experimental group will complete LAs in less time, because alignment of learner and LA characteristics will increase the efficiency of the learning process (Efficiency).

3. The experimental group has a broader variety of learning paths than the control group because the RS supports more personalized navigation (Variety).

4. The experimental group will be satisfied with the navigational support of the RS (Satisfaction).
Experimental Design

4 Months

Control Group
Using adjusted Moodle LMS
No Recommender!
122 students

Experimental Group
Using adjusted Moodle LMS + Recommender System
Personalisation
122 students
ISIS Results / Effectiveness

1. The experimental group was consistently found to be more effective in completing LAs than the control group during the experimental period.

2. But we have not found a significant difference; therefore, hypothesis 1 cannot be confirmed.
ISIS Results / Efficiency

1. The experimental group consistently needed less time to complete equal amounts of LAs
2. This effect was found to reach significance after 4 months. Therefore, hypothesis 2 could be confirmed.

\[(F(1,99) = 5.14, \ p = .026).\]
ISIS Results / Variety

1. The variety of personalized learning paths increased by the RS. The experimental group from the beginning onward created more personalized learning paths.

2. The experimental group made more ties between the LAs in the LN, thus we confirm hypothesis 3.
Simulation Interface

U = user-based filtering
I = item-based filtering
C = control group

[Drachsler, 2008b]
Feeding the Simulation

New recommendation techniques in Simulation

Experiment by Janssen et al. 2005

Experiment by Drachslcer et al. 2008b

Simulation by Nadolski et al. (accepted)

Simulation by Koper 2005

Accepted by Simulation 2005
Simulation / Hypothesis

1. The experimental groups will be able to complete more LAs than the control group (Effectiveness).

2. The experimental group will complete LAs in less time, because alignment of learner and LA characteristics will increase the efficiency of the learning process (Efficiency).

3. The experimental group has a broader variety of learning paths than the control group because the PRS supports more personalised navigation (Variety).

4. The experimental group will be satisfied with the navigational support of the PRS (Satisfaction).
Simulation / Experiment Design

Evaluation of experimental results for user- and item-based collaborative filtering in LNs with different sizes.
Open Issues and Future Goals

Open Issues

1. Further possibilities to integrate pedagogy rules into the recommender system.
2. Apply multi-criteria ratings for deeper reasoning.
3. Using tags to cover the cold-start of informal learning environments.

Future Goals

1. Mash-up recommender system study
2. Open Educational Resources study
References


Many thanks for your interests!

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