Question-answering through selecting and connecting peer-students

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Introduction
Why Question-Answering

Objectives
• Connecting the learners (proactive sharing)
• Creating sustainable support facilities (effective support)

Stakeholder workshops
• A set of critical support activities

One of the main examples raised, question-answering
• High frequency
• Disruptive
• Important for the learner
What is a Question?

Ask your question

What is the difference between heat and temperature? If it gets warmer, the temperature gets higher too! But apparently the same amount of heat can lead to different temperature increases. How come?

Cancel  Submit
Essence of the approach
Main steps

1. A student poses a question.
2. The system determines:
   – text fragments to help answering the question;
   – the topic(s) of the question;
   – the most suitable peer-learners.
3. The system sets up a wiki with the question, the text fragments and guidelines.
4. The selected peer-students receive an invitation to assist.
5. The questions poser and his peers discuss and phrase an answer in the wiki.
6. The question poser closes the discussion and rates the answer.
The main steps

methods used

Text fragments to help answering the question:
• Latent Semantic Analysis to select the text from the studied material

The topic(s) of the question:
• Latent Semantic Analysis to identify the topic(s)

The most suitable peer-learners, a selection based on a weighted sum of four criteria:
• content competency
• availability
• tutor competency
• eligibility
Student Question interface
Deze wiki is opgezet namens "Peters Adminaccount" om bijgaande vraag te beantwoorden:

- Lees de vraag en de tekstsuggesties aandachtig voordat u een antwoord formuleert.
- Stel zo nodig in de wiki een vraag ter verduidelijking.
- Probeer in overleg zo snel mogelijk tot een antwoord te komen.
- Selecteer "Bewerk" om uw antwoord in te voeren.
- Tot slot, "Peters Adminaccount" rondt de vraag af door een beoordeling van het antwoord te geven. Als een vraag afgerond is, wordt dit aangegeven door een vinkje voor de vraag.

Vraag:
Laatst was ik aan het chatten en in de chatbox waar ik in zat waren mijn medechatters allemaal mooie avatars. Ik vroeg mezelf af hoe je aan deze avatars komt en kun je ze ook zelf maken? Is er misschien software waarmee je eigen avatar kunt ontwerpen?

De cursus bevat de volgende teksten die mogelijk relevant zijn bij het beantwoorden van de vraag. Klik op de bijbehorende links om de teksten te bekijken:

- Tekst 1
- Tekst 2
- Tekst 3
Validation of the system

Is it possible to determine an appropriate combination of LSA parameters to identify topics and text fragments:

– Calibration based on 2 sets of 16 questions (system vs experts)

Selection rules: do they live up to the expectations e.g. involvement and workload spread:

– Simulation of a number of situations: questions and students’ status

How will it work in real use a.o. user acceptance & questions resolved:

– An experiment with 2 groups of students (2 settings of criteria)
Results Calibration

Set 1: LN assessment questions

11 Topics
16 Assessment Questions

- no-match
- match-33%
- match-67%
- match-100%
**Results Simulation**  
peer-selection

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<tr>
<th>Question-id</th>
<th>0.78</th>
<th>Q5</th>
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<td>Correlation</td>
<td>0.78</td>
<td>AN2: ‘Using Internet Explorer’</td>
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<th>Student-id</th>
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<td>0.5</td>
<td>0.5</td>
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Experiment data

• Learning network with 11 topics; 8 weeks
• 110 students in 2 groups: 78 active (40 : 38)

• Data: loggings; various ratings; questionnaire; expert

• 101 questions
• 82 resolved (10 under discussion; 9 failed so far)
• 3.8 average answer rating (5-point scale)
• 47 students posed; 65 assisted; 68 involved
## Experiment data

### solved questions

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<tr>
<th></th>
<th>Group</th>
<th></th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Experimental</td>
<td>Control</td>
<td>Total</td>
</tr>
<tr>
<td>Solved Questions</td>
<td>Not solved</td>
<td>17 (28.8%)</td>
<td>23 (54.8%)</td>
</tr>
<tr>
<td></td>
<td>Solved</td>
<td>42 (71.2%)</td>
<td>19 (45.2%)</td>
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<tr>
<td>Total</td>
<td></td>
<td>59 (100%)</td>
<td>42 (100%)</td>
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</tbody>
</table>
## Experiment data

### Number of invited students per questions

<table>
<thead>
<tr>
<th>Number of invited students</th>
<th>Group</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Experimental</td>
<td>Control</td>
</tr>
<tr>
<td>2</td>
<td>47 (79.7%)</td>
<td>21 (50.0%)</td>
</tr>
<tr>
<td>4</td>
<td>12 (20.3%)</td>
<td>21 (50.0%)</td>
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<tr>
<td>Total</td>
<td>59 (100.0%)</td>
<td>42 (100.0%)</td>
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# Experiment data

**answer time**

<table>
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<tr>
<th>Answer time in hours</th>
<th>Group</th>
<th>N</th>
<th>Mean Rank</th>
<th>Sum of Ranks</th>
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<td></td>
<td>Experimental</td>
<td>53</td>
<td>35.24</td>
<td>1867.50</td>
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<tr>
<td></td>
<td>Control</td>
<td>29</td>
<td>52.95</td>
<td>1535.50</td>
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<tr>
<td></td>
<td>Total</td>
<td>82</td>
<td></td>
<td></td>
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Almost all respondents (n=57) agreed that answering a question is a good investment of time, motivations:
• “I am aware that other students also have questions” (n=24)
• “It improved my knowledge and understanding” (n=29)

Usefulness: 26 experimental; 17 control
Usability: 22 experimental; 16 control
Use it again: 25 experimental; 16 control
Conclusions

Model is successful:
+ Calibration approach
+ Simulation results
+ Experiment data

Open questions:
? Community formation
? Open, ‘unending’ course
? Use of already achieved competences (eportfolio)
Questions .....