Designing optimal peer support for knowledge sharing in Learning Networks

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Problems when self-organizing knowledge sharing in Learning Networks (LNs)

- Learners rely on peers to share knowledge with.
- Stage 1: Finding a suitable peer tutor
- There is no social structure of a class or group in LNs.
- Learners do not know each other.
- Learners do not share a common history.
- Stage 2: Maintaining interaction to reach mutual/shared understanding
- LNs are online social networks for learning purposes.
- Knowledge sharing requires additional skills of communication and coordination.
Cognitive load and an optimal peer support for knowledge sharing

- Without support, self-organizing knowledge sharing imposes learners extra **cognitive load**.

- When working on complex tasks, this easily **overload** learners’ limited cognitive capacity and this in turn is **detrimental** to learning.

- We propose to design an **optimal peer support** for knowledge sharing to …

  1. Alleviate learner cognitive load
  2. Contribute to deeper learning and better learning performance
  3. Contribute to better learner satisfaction with the knowledge sharing process

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Two stages of knowledge sharing in Learning Networks

Stage 1: Finding a suitable peer tutor

- An automated tutor selection system
- Selection criteria

Stage 2: Maintaining interaction to reach mutual/shared understanding

- Communication medium
- Interaction structures
What kind of peer tutors are more likely to optimize knowledge sharing process?

Peer tutors with tutoring skills (TS)?  Peer tutors with content knowledge (CK)?
Current experiment:
The effects of intervening tutors with tutoring skills (TS) vs. content knowledge (CK) on tutees and tutors

- We assign each student to act as either tutor or tutee.
- Tutors and tutees work in pairs to first chat about an essay question.
- With help from tutors, tutees have to summarize chats to answer the essay question.
- For tutors, we give them instructions of either tutoring skills or content knowledge.
  - Tutoring skills consist of
    - general skills of asking and answers questions
    - Task-related skills of dealing with an essay question
  - Content knowledge consists of
    - Supplement texts related to the essay question
### Preliminary results
**Tutoring skills (TS) vs. Content knowledge (CK)**

<table>
<thead>
<tr>
<th>Measures</th>
<th>Data <strong>tutees</strong></th>
<th>Data <strong>tutors</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive load (CL)</td>
<td><strong>TS</strong>-tutees experienced lower CL than <strong>CK</strong>-tutees</td>
<td><strong>TS</strong> and <strong>CK</strong> tutors experienced CL differently</td>
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<tr>
<td>Learning performance on 5 MCQs</td>
<td><strong>CK</strong>-tutees perform better than <strong>TS</strong>-tutees</td>
<td><strong>TS</strong>-tutors perform <em>significantly</em> better than <strong>CK</strong>-tutors</td>
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<tr>
<td>Satisfaction with the knowledge sharing (KS) process</td>
<td><strong>CK</strong>-tutees are more satisfied with the KS process than <strong>TS</strong>-tutees</td>
<td><strong>TS</strong>-tutors are more satisfied with the KS process than <strong>CK</strong>-tutors</td>
</tr>
</tbody>
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*TS* and *CK* denote Tutoring skills and Content knowledge, respectively.