Peer Tutoring Orchestration
Streamlined Technology-driven Orchestration for Peer Tutoring

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CSEDU 2017 · Porto, Portugal · April 21–23 2017
About us (2)

Richard Whittemore/Flickr
Introduction

Formal learning spaces can become effective by supporting educators with orchestration.
Orchestration is extremely challenging

Contemporary orchestration is extremely challenging and arguably ad hoc.

Streamlined orchestration—attainable through explicit organisation of enactment activities—could potentially make educators more effective.

*Streamlined Orchestration (Computers & Education 2016).* Lighton Phiri, Christoph Meinel and Hussein Suleman.
Technology-driven organised orchestration for peer tutoring

The objective of this work was to investigate the applicability of technology-driven organised orchestration when applied to the peer tutoring educational setting.
The case of large-scale peer tutoring

Peer tutoring involves smaller manageable groups of students learning with or from each other.

However

- Tutors sometimes lack experience.
- Tutorial sessions are usually lack structure.

http://www.uct.ac.za
Peer tutoring model in study context

<table>
<thead>
<tr>
<th>Course</th>
<th>Students</th>
<th>Tutors</th>
<th>Tutorial Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSC1015F</td>
<td>754</td>
<td>38</td>
<td>12</td>
</tr>
<tr>
<td>CSC1017F</td>
<td>165</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>CSC1010H</td>
<td>80</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>CSC1011H</td>
<td>26</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>
Peer tutoring orchestration toolkit

Implementation based on IMS Global Simple Sequencing standard. Directed path used for toolkit.

Source: http://simba.cs.uct.ac.za/indefero
Peer tutoring toolkit functionality

Pre-session Management
- Activity Management
- Resource Management
- Sequencing

Session Management
- Playback Sequence Chain
- Access Resources
Instrumentation

- Orchestration load and usability measured.
  - NASA Task Load Index (NASA-TLX) used to measure orchestration load.
  - Perceived Usefulness and Ease of Use used to measure usability.
Evaluation setup

- Laboratory study involving 24 tutors for first year Computer Science modules.
  - One-on-one hour-long sessions.
Participants demographics

- Participants’ levels, experience and courses tutored were noted. Tools used in sessions noted.
Evaluation procedure

- Three tasks conducted: (1) activity management, (2) resource management and (3) sequencing.
Evaluation procedure

- Pairwise comparison of six NASA-TLX subscales
- Rating of each of the six NASA-TLX subscales
Evaluation procedure

- PUEU questionnaire after completing the three experimental tasks.
Organised orchestration imposes acceptable workload

Scripting Phases
NASA-TLX Weighted Workloads

- Activity Management
- Resource Management
- Sequencing Activities

Mean Weighted Rating

[Bar chart showing mean weighted ratings for Activity Management, Resource Management, and Sequencing Activities]
Resource managed imposes the most workload

Scripting Phases
NASA-TLX Subscale Ratings

<table>
<thead>
<tr>
<th>NASA-TLX Subscales</th>
<th>Activities</th>
<th>Resources</th>
<th>Sequencing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Demand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental Demand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temporal Demand</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Effort</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frustration</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mean Raw Rating

19
# Perceived usefulness scores

<table>
<thead>
<tr>
<th>A.</th>
<th>Perceived Usefulness</th>
<th>5.12 (1.14)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Accomplish tasks quickly</td>
<td>4.50 (1.67)</td>
</tr>
<tr>
<td>2.</td>
<td>Improve job performance</td>
<td>5.42 (1.18)</td>
</tr>
<tr>
<td>3.</td>
<td>Increase productivity</td>
<td>5.25 (1.15)</td>
</tr>
<tr>
<td>4.</td>
<td>Enhance effectiveness</td>
<td>5.38 (1.41)</td>
</tr>
<tr>
<td>5.</td>
<td>Easier to do my job</td>
<td>4.71 (1.63)</td>
</tr>
<tr>
<td>6.</td>
<td>I would find system useful</td>
<td>5.46 (1.41)</td>
</tr>
</tbody>
</table>
Perceived ease of use scores

<table>
<thead>
<tr>
<th></th>
<th>Perceived Ease of Use</th>
<th>5.80 (0.85)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Learning system would be easy</td>
<td>6.25 (1.15)</td>
</tr>
<tr>
<td>8</td>
<td>Easy to do what I want to do</td>
<td>5.46 (1.69)</td>
</tr>
<tr>
<td>9</td>
<td>Clear and understandable</td>
<td>5.79 (1.10)</td>
</tr>
<tr>
<td>10</td>
<td>Flexible to interact with</td>
<td>4.83 (1.40)</td>
</tr>
<tr>
<td>11</td>
<td>Ease to become skillful</td>
<td>6.33 (0.82)</td>
</tr>
<tr>
<td>12</td>
<td>I would find system easy to use</td>
<td>6.13 (1.12)</td>
</tr>
</tbody>
</table>
Conclusions and future work

● We set out to investigate the effect of technology-driven organised orchestration when applied to peer tutoring.
  ○ Organised technology-driven orchestration for peer tutoring is potentially feasible.
  ○ Toolkit potentially usable and useful.
● An experiment is scheduled to assess viability of the tool, with a focus on the in-session activities.
Thank you for your time!

Questions?
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Backup slides: philosophical argument

- Laptop Project@ UCT
- Classroom Renewal@ UCT
- One Laptop per Child
- ICT4RED in Cofimvaba