Proseminar SS11

“Different collaborative tasks - Different displays”

The choice of display environment

Philipp Hauptmann
1. Overview of display types

2. Advantage and disadvantage of each display

3. Which display for which task?

4. Summary
1. Display overview
Tabletop

Source: http://hci.ucsd.edu/
Interactive whiteboard

Source: http://www.spectronicsinoz.com/images/product/intelli/ics-inwhiteboard.jpg
Desktop monitors

Source: http://stats.wustl.edu/
Mobile devices

Source: http://www.imex.ie
Multi display environment

Source: http://4.bp.blogspot.com/_D8P4hByt4sc/TDqolF4r-EI/AAAAAAAAASU/GSeWfzNWpuI/s1600/IMG_0512.JPG
2. Advantage and disadvantage of each display
Tabletop

+ flexible user arrangement
+ known from table
+ on-task communication

- risk of interfering each other

Source: http://edutech.uni-saarland.de/uploads/DigiTile-InAction.jpg
Interactive whiteboard

+ same perspective
+ focused — time-efficient
+ maintain awareness of activities

- viewer in front
- not enough place for „real“ collaboration
- reaching problems possible

Source: http://www.spectronicsinoz.com/images/product/intelli/ics-inwhiteboard.jpg
Desktop computer

+ on-task communication essential

- one-user, one-display paradigm
- older students feel socially uncomfortable

Source:
http://1.bp.blogspot.com/_k5GGAegVuso/TLXB80RUFVI/AAAAAAAAEQ/6KdxfBY5GWg/s1600/collaborative.bmp
Mobile devices

+ control from anywhere
+ individual devices / workspace

Source: http://www.einstruction.eu
Multi display environments

+ combine advantages
+ individual workspace

- distraction possible

Source: http://4.bp.blogspot.com/_D8P4hByt4sc/TDqolF4r-El/AAAAAAAASU/GSeWfzNWpui/s1600/IMG_0512.jpg
3. Which display for which task?
Exploratory Study (Kori Inkpen et al., 2005)

- 48 participants

- four display factors:
  - angle
  - user arrangement
  - display size
  - number of displays

Source: http://www.mapstop.co.uk/
<table>
<thead>
<tr>
<th>ANGLE</th>
<th>ARRANGEMENT</th>
<th>SIZE</th>
<th>NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Horizontal</td>
<td>Vertical</td>
<td>Side-by-Side</td>
</tr>
<tr>
<td>Pointing gestures</td>
<td>115 (36)</td>
<td>70 (51)</td>
<td>101 (16)</td>
</tr>
<tr>
<td>Writing</td>
<td>33 (11)</td>
<td>30 (17)</td>
<td>34 (19)</td>
</tr>
<tr>
<td>Partner gaze</td>
<td>22 (13)</td>
<td>19 (15)</td>
<td>9 (8)</td>
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<tr>
<td>On-task communication</td>
<td>94 (32)</td>
<td>61 (21)</td>
<td>62 (37)</td>
</tr>
<tr>
<td>Preparatory</td>
<td>17 (7)</td>
<td>10 (4)</td>
<td>15 (4)</td>
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</tbody>
</table>

Source: Kori Inkpen et al. (2005), Exploring Display Factors that Influence Co-Located Collaboration: Angle, Size, Number, and User Arrangement
Tabletop

- two or more people gather around tabletop
- on-task communication to solve task

Task:
Solve exercise together

Application (for example):
DigiTile

Source: http://edutech.uni-saarland.de/uploads/DigiTile-InAction.jpg
Interactive whiteboard

- everybody sees everything of the data

Task (for example):
Collaborate creating

Source: http://www.eecs.berkeley.edu/
Desktop computer

- most uncomfortable way of CSCL

Task:
Getting children introduced to CSCL

Source: http://1.bp.blogspot.com/_k5GGAegVuso/TLXB80RUFVI/AAAAAAAAEQ/6KdxfBY5GWg/s1600/collaborative.bmp
Mobile devices

- bring separate data together (whiteboard)

**Task:**
include students in lesson design

**Application** (for example):
*KidStory, ImageMap*

Multi display environments

- individual workspace + public board

**Task:**
like mobile devices, but more possibilities

**Application** (for example):
*GroupScribbles*

**Sources:** http://4.bp.blogspot.com/ http://groupscribbles.sri.com/ (right)
4. Summary
- two or more users → shared display
- displays are flexible → can't be allocated to certain tasks
- all types together → use collaborative learning to full capacity
Thanks for your attention!