Mobile Collaboration for Young Children

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Children are mobile!!!

Inside the house

Where have you been?
Two heads are better than one
The whole is greater than the sum of its parts
Collaboration

- Important for social and cognitive development
- Can support constructionism
- Expanded user interface

Young Children

- Increasing population
- Increasing usage of mobile devices
- Personal expertise

Mobile

- Availability
- Bridges physical and traditional computing
- Ability to create in context

Availability

Bridges physical and traditional computing

Ability to create in context

Important for social and cognitive development

Can support constructionism

Expanded user interface

Increasing population

Increasing usage of mobile devices

Personal expertise
Collaboration
To work together, especially in a joint intellectual effort.
(www.dictionary.com)

Spatial
<table>
<thead>
<tr>
<th>Co-located</th>
<th>Distributed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synchronous</td>
<td>Same Place &amp; Time</td>
</tr>
<tr>
<td>Asynchronous</td>
<td>Same Place, Different Time</td>
</tr>
</tbody>
</table>

Temporal

Young Children
Ages 6-10

Mobile
Move Beyond …

- Devices for consumption/entertainment/collection

- To make mobile devices more:
  - Collaborative
  - Child-appropriate
  - Creative, generative, constructive

- Kidsteam

- Cooperative Inquiry (Druin, CHI 1999; Guha et al., IDC 2004)
Prototype System – Mobile Stories

- Stories and Scenes
  - Picture
  - Text
  - Sound

- Client/server model
  - Changes propagated to each device
  - Over 802.11
Pilot Study

- At Fort McHenry National Park

- Children create collaborative story

- Purpose
  - Directly observe children’s collaboration
  - Further the design process
Evolution of a Shared Scene

Fort McHenry

What do you think?

Fort mchenry is a park of history that survived war.

Anthem

Battleship

Changed...
12:21 Picture
12:25 Text
12:27 Picture
12:31 Text
12:32 Picture
12:33 Picture
12:34 Picture
12:35 Picture
12:37 Picture
Face-to-Face Collaboration
Co-present Mobile Collaboration

- Space-sharing
- Content-splitting
- Sharing interactions
  - Navigation/focus
  - Editing
  - Copying/trading

- Bumping (Hinckley, 2003)
- Tossing (Yatani et al., 2005)
- Stitching (Hinckley et al., 2004)

Ciconia Ciconia (White Stork) by Andrea Petrlik published 2003

Kašmir Promet - Croatia, Available in the International Children’s Digital Library (ICDL)
Take Home Message

- Many ways to collaborate
- Interfaces need to support several ways
- Mobile devices need new interfaces and interactions to support these interfaces

Mobile Collaboration for Young Children

Educational learning
The way mobile devices are used
Acknowledgments

Kidsteam
National Park Service
Microsoft

www.cs.umd.edu/hcil/mobilestories/

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Collaborative Play
Research Approach (Design)

- Kidsteam
- Cooperative Inquiry (Druin, CHI 1999; Guha et al., IDC 2004)
Formative Research

- **Physical vs. virtual** (Fails et al., IDC 2005)
  → Mobile devices could bridge the divide

- **Tangible Flags** (Chipman et al., IDC 2006)
  → Collaboration, organizing collections

- **Collections**
  - Kids collect but do not (want to) organize
  → Implicit organization via narratives

- **Mobile Stories** (Fails, IDC 2007)
  - Design sessions with Kidsteam
  - Fort McHenry National Park
  → Mobile collaboration
Children are mobile

Inside the house

Where have you been?
Children are mobile

Collaboration is important to the social and cognitive development of children

Mobile Collaboration for Young Children
Mobile Collaboration for Young Children

Educational learning
The way mobile devices are used
Collaboratively Construct Children’s Stories in Mobile Settings
Summary / Take Home Message

- Mobile collaboration is important
Tangible Flags

- Started breaking down the collaborative barriers
- Allowed mobility and knowledge construction
- Demonstrated the importance of construction/creation in context and collaboration

(Chipman et al., 2006)
Audio Data Collection

Mobile Children’s Stories Constructionism Collaboration
Construction

Magazine

Anthem

O say can you see by the dawn’s early light what so proudly we hailed
at the twilight’s last gleaming who’s bright stripes and bright stars
through the perilous fight throught the ramparts we watch were so
gallantly streaming by the rockets red glare, the bombs

New Scene (38.95 sec)
Research Approach (Evaluation)

- Formative comparative study of interfaces
  - Within subject
  - Counter-balanced

- Field, case study
  - Focus on collaboration
  - Multiple data collection methods
    - Technology logs, video, field notes, interviews/questionnaires, collaborative stories

How do collaborative mobile technologies affect children’s collaboration?
International Children’s Digital Library

www.childrenslibrary.org
Prototype Limitations (2 of 2)

- No integrated camera
- Range of wireless (for collaboration)
- Interface
  - Screen space
  - Simple scene/page paradigm
Children are mobile

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