Tangible Flags

Collaborative Educational Technology to Enhance Grade School Field Trips

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Classroom of the Future project

- Research Focus
  - Educational Technology
  - Design processes

- Target Users
  - School children
  - Grades K-4

- Think outside the classroom
### A gap in learning experiences

<table>
<thead>
<tr>
<th>Field Trip</th>
<th>Classroom</th>
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<tbody>
<tr>
<td><strong>Learning in an authentic context</strong></td>
<td><strong>Create Explicit Representations</strong></td>
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<tr>
<td>- Exploration</td>
<td>- Collaboration</td>
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<tr>
<td>- Observation</td>
<td>- Expression</td>
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<tr>
<td>- Note taking</td>
<td>- Synthesis</td>
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<tr>
<td><strong>Hard to collaborate</strong></td>
<td><strong>Removed from original learning context</strong></td>
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<tr>
<td>- Awareness</td>
<td>- Notes removed from context</td>
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<tr>
<td>- Access to information</td>
<td>- Can not iteratively explore</td>
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What can mobile technology do?

- Situate information in the real world
  - Information *accessed* in a relevant context
    - Compare information and environment
  - Information *created* in a relevant context
    - More synthesis in context
    - Further exploration of environment

- Support collaboration
  - Awareness of others’ activities
    - Exploration and information creation activities
    - Awareness in context
  - Switch between individual and collaborative activity
    - Freedom to individually explore
    - Easy to initiate collaboration
Related Work

- Digital Augmentation of Learning Environments for Older Children
  - Ambient Woods (Rogers, et al. 2004)
    - Collaboration in context
  - HyCon Explorer (Bouvin, et al. 2005)
    - Location based augmentation

- Concurrent Interaction for Younger Children
  - Kidpad and Klump (Benford, Bederson, et al. 2000)
    - Encouraging collaboration
  - Understanding Children's Collaborative Interactions in Shared Environments (Scott, et al., 2003)
Tangible Flags Technology

- Situating information
  - Tangible Flag marks real world
    - Age appropriate interaction
  - Tablet PC views info
    - Reads Radio Frequency ID tag
    - Info on wireless server
- Enhance students’ awareness
  - Visual flag indicates
    - Exploration activity
    - Information creation
    - Identity of author
  - Easily turn awareness into collaboration
Collaborative Interface

- Flag page
  - Concurrently shared space
    - Instant collaboration
  - Color indicates author
- Flag thumbnail
  - Access discovered flags
    - Context of original discovery
  - See changes real time
- ScratChat IM
  - Temporary messages
Tangible Flags at a National Park

- Rock Creek National Park
  - Forest walk scavenger hunt
  - 3 teams of children explored independently

- Situated information
  - Learner directs learning

- Ranger participation
  - Flagged interesting spots
  - Tablet PC in observer mode

- Enhanced collaboration
  - Concurrent interaction
  - Remote access
National Park Examples

Why is this leaf still green? Always green?

Do you think it's an old tree? Sure

Brown tree

Shure

Twins a little

Prickly

Texture, Color, Size, and Shape
Future Considerations

- Addressing issues of scale
  - Colored pens limits number of authors
  - Shared space on Flag pages cluttered
    - How to scale for many students

- Integrating artifacts with the classroom
  - Both learning environments important
Conclusion

- Situate Information
  - Enable students to
    - Both access and create information in context
    - Iteratively examine the real world while working with learning materials
    - Guide their own learning

- Support Collaboration
  - Support students in
    - Awareness of peer activity and joint work
    - Easily switching between individual and joint work
    - Concurrent interaction
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For further information on this project:

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