



# Tangible Flags

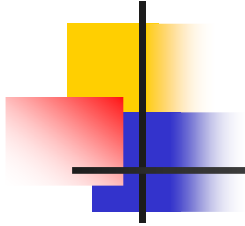


## Collaborative Educational Technology to Enhance Grade School Field Trips

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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

## Field Trip

- Learning in an authentic context
  - Exploration
  - Observation
  - Note taking
- Hard to collaborate
  - Awareness
  - Access to information

## Classroom

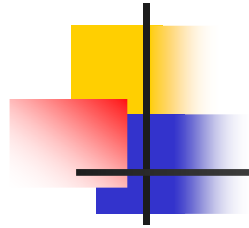
- Create Explicit Representations
  - Collaboration
  - Expression
  - Synthesis
- Removed from original learning context
  - Notes removed from context
  - Can not iteratively explore



# What can mobile technology do?

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- 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

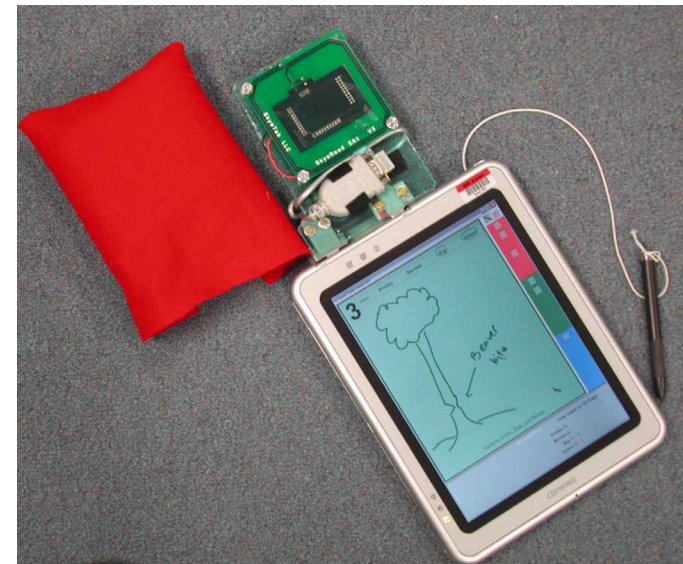
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- Digital Augmentation of Learning Environments for Older Children
  - Ambient Woods (Rogers, et al. 2004)
    - Collaboration in context
  - HyCon Explorer (Bouvin, et al. 2005)
    - Location based augmentation
- Concurrent Interaction for Younger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

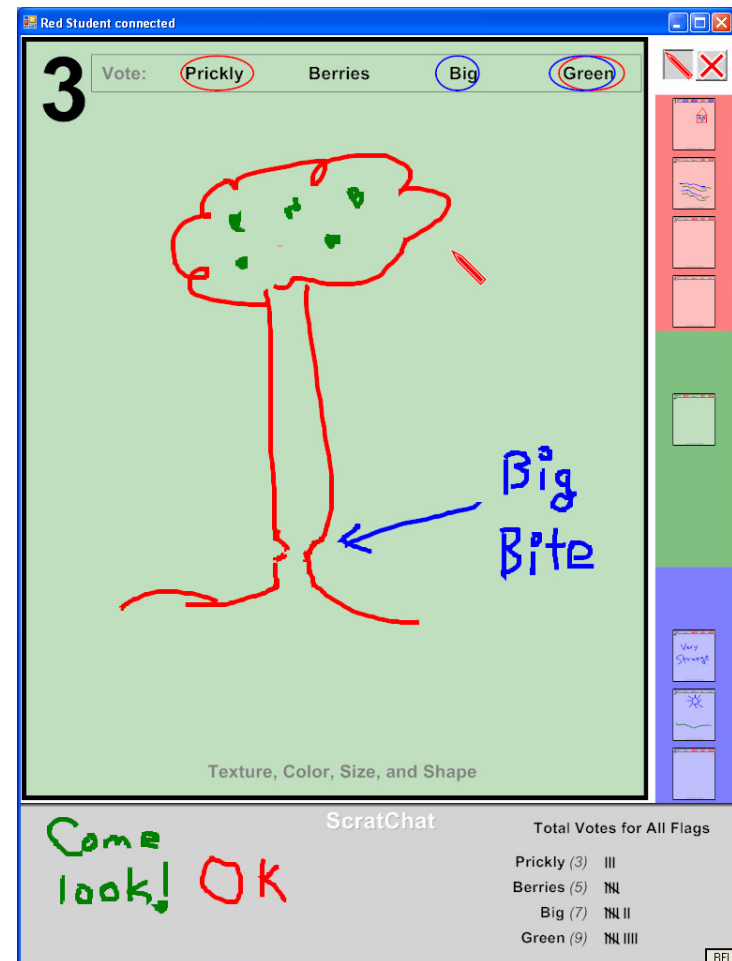
- Situating information
  - Tangible Flag marks real world
    - Age appropriate interaction
  - Tablet PC views info
    - Reads Radio Frequency ID tag
    - Info on wireless server
- Enhance students' awareness
  - Visual flag indicates
    - Exploration activity
    - Information creation
    - Identity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





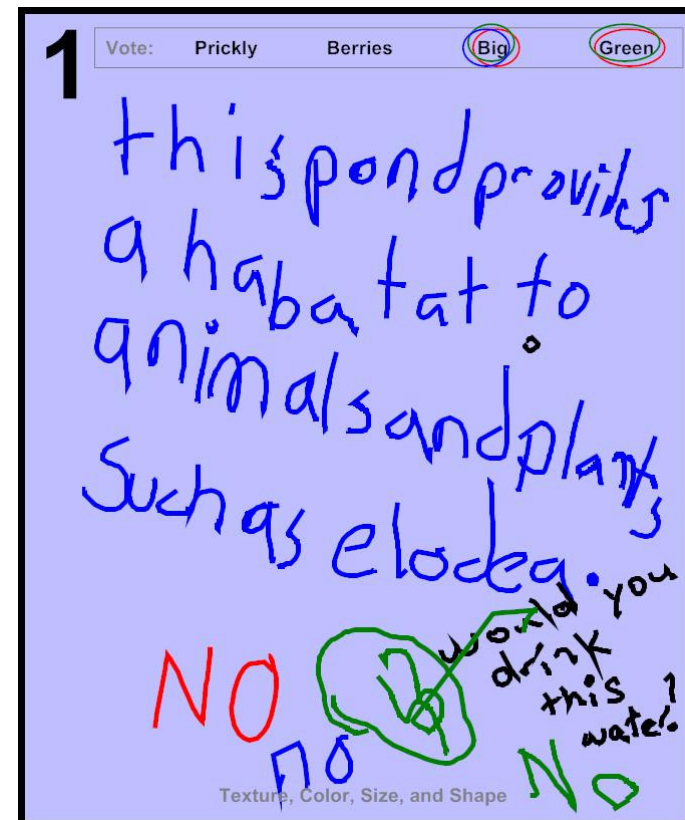
# Collaborative Interface

- 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



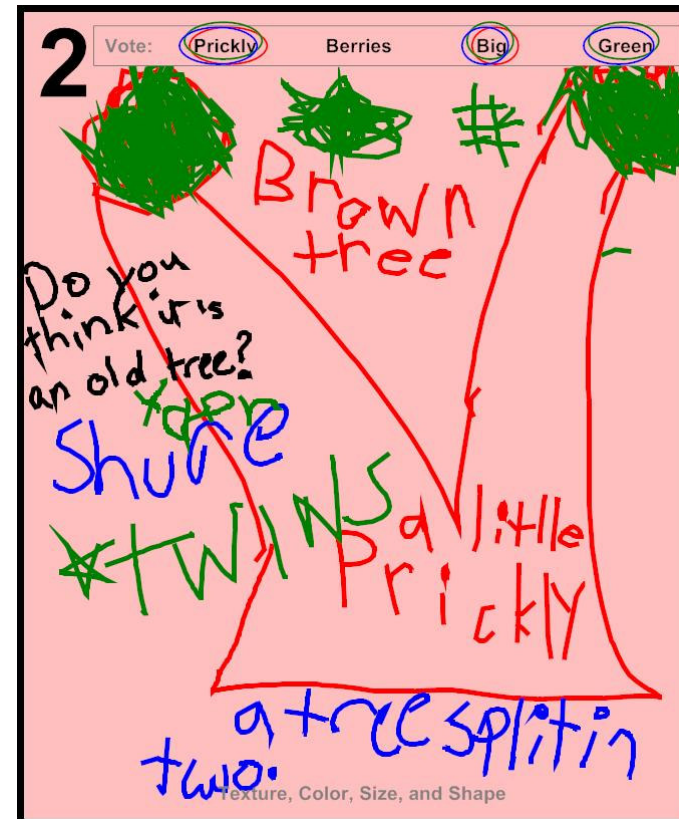
# Tangible Flags at a National Park

- 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





# Future Considerations

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- 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

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- 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



# Acknowledgements

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