Exploring Display Techniques for Mobile Collaborative Learning in Developing Regions

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Current State

Image Courtesy: Joyojeet Pal
Current State
Approaches to Technology in Education

[1] Outdoor computer kiosks, supporting the goal of self-learning

[2] E-Learning Materials with a pedagogical focus

[3] Imparting education using games on inexpensive cellphones

[4] Using multiple mice to impart healthcare learning
Requirements

• Inexpensive (Project#1,2,3,4)
• Plug-and-Play (Project#1,2,3,4)
• Scalable (Project#1,2,3,4)
• Enforce Collaboration (Project#4)
• Mobility (Project#3)
• Not restricting the play behaviour (Project#3)

SDG
Single Display
Groupware

Projector
1 Cellphone
N Joysticks

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Research Questions

• What kind of communication occurs, both as individual and as teams in the two display conditions, and does that have any impact on learning?

• How does the student play behaviour differ in the two display conditions?
Design: Collaborative Boggle™
Design: Collaborative Boggle™

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APPLE

Apple
Participants

• School 1: CLT
  – 4 weeks \{2 weeks formal study\}
  – 8 participants (1 female)

• School 2: CHI
  – 5 weeks \{3 weeks formal study\}
  – 34 participants (16 females) – for initial 4 weeks
  – 16 participants (10 females) – for the last week

• Within Subjects Design with Matched-Groups
Methodology

• Week 1: - English Proficiency Test
  - black-board Boggle™
  - black-board Collaborative Boggle™
**Methodology**

- **Week 1:** - English Proficiency Test  
  - black-board Boggle™  
  - black-board Collaborative Boggle™

- **Week 2:** - SDG and MDG game-play approaches  
  - HCI issues {observed and fixed}  
  - Pre-test for Week 3

- **Week 3 onwards:** - M, T, W, Th: Game-play  
  - F: Image-word Association Pre-Post Test, Interviews
Results: Pre-Post Tests
Game Score per day, Collaboration

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Physical+Verbal Fight
Taking control of other’s device
Complaint, Learning-based
Mobility
"like a gun", "like remote control"

"Big-bright screen", "distorted screen"

"Its easier as joystick needs to be moved, not pressed. There is something in centre, and we can move Left, Right, Up or Down"

"joystick not so accurate"

"like a laptop"

"Screen is good, more viewable and clear", "Small screen"

"perfect aiming in phone"

"I like to spell, spelling is good"

"stars and rocket going up is really good"

"I love to compete... winning is good"

"... nothing specific about the game, I just like playing with my friends"
Discussion

• Classroom vs. Field

• Communication

• Game-play
Future Work

• Including passive onlookers

• Competition vs. Collaboration vs. Competition+Collaboration game

• Truly-mobile, role-playing games for MDG
Thank YOU