

# POPSIGN DESIGN OF AN AMERICAN SIGN LANGUAGE MOBILE LEARNING GAME

CELESTE MASON – MS-HCI PROJECT – APRIL 30, 2015 - ADVISOR: THAD STARNER

### Problem to Address

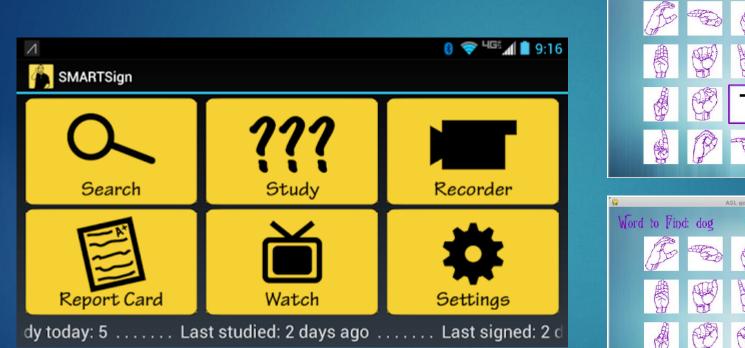


90 to 95% of deaf children are born to hearing parents

- Complex set of factors influence their decision to learn American Sign Language (ASL)
  - Time constraints
  - Confusing advice from experts
  - Social stigma of signing in public
  - Lack of adequate learning resources and support

# Current Apps





#### SMARTsign – Kim XU



ASL Mobile Game – Chrystina Wilson

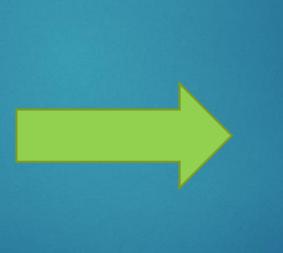
### Proposed Solution POPsign





A mobile ASL game design based on popular gameplay design practices 







#### Users & Requirements



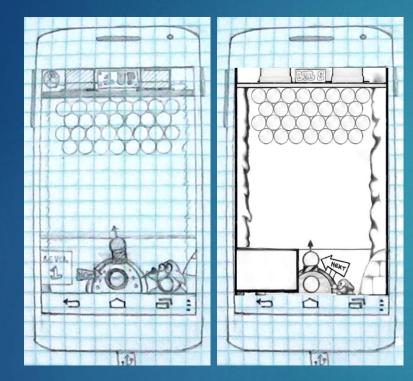
As broad a user base possible
Adults in Age Range typical of parents

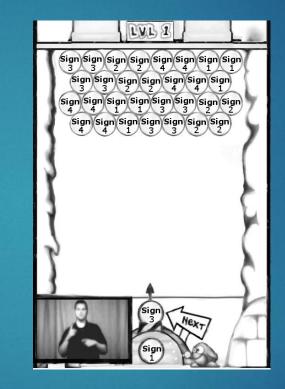
#### **Motivation**

Make use of free time to:
 Have Fun
 Learn ASL

# Early Design







Layout



- Paper Prototype
- Determine Requirements
- Incorporate ASL elements

# Prototype Design & Evaluation



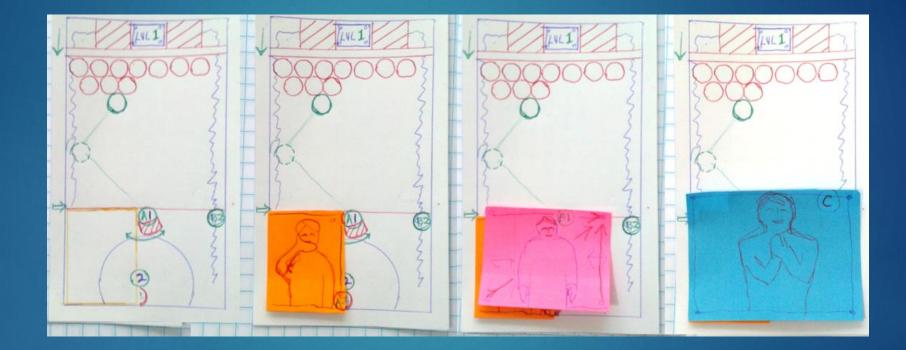


Rough Prototype
 Preliminary Evaluation
 Experts
 Potential Users

- Potential Tasks
   Puzzle Mode
   Arcade Mode





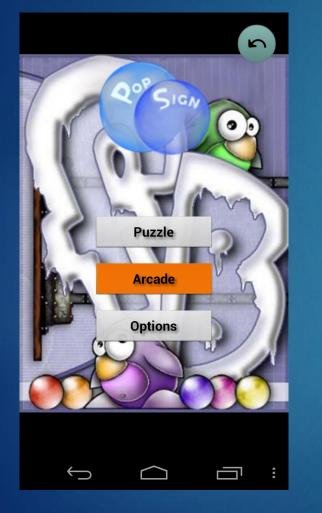


Paper Prototype – V2

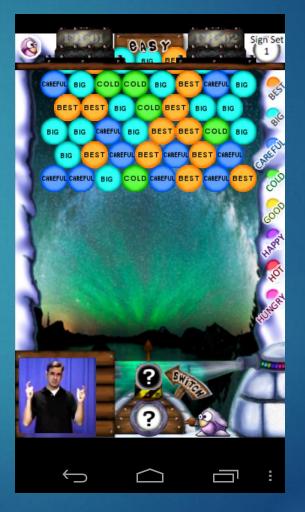
Vary Video Dimensions and placement

### Implementation









 Frozen Bubble Android Port
 Java / C++

Eclipse IDE

SMARTsign Dictionary

### User Interface

Two Tasks, Three Primary Screens: Puzzle, Arcade, Options







Arcade Mode





#### User Evaluation

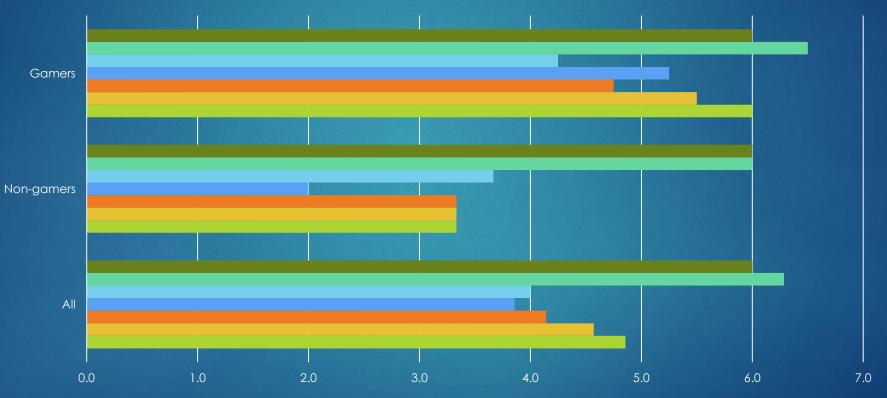


- 7 Participants: Ages 20 34
- Recruited by email, flyer, and word-of-mouth
- At locations convenient for them
- Video Camera and Written Notes
- Pre-Evaluation and Post-Evaluation written assessment
  - Questionnaires: gaming preferences, experience, user interface interactions
- Cognitive Walthrough, Think-aloud Protocol
  - Series of 4 Tasks + 1 Optional

#### **Results** Gameplay Preferences



Value of Game Elements I - Gamers vs Non-Gamers



■ puzzles, problem solving ■ strategy ■ fighting ■ commerce, trading ■ building, creation ■ collection ■ exploration

### Results

7.0 6.0 5.0 4.0 2.0 1.0 0.0 recontes mos oudio doped interactions entry able responsive controls intitle comos hequentcoshes Note helphints? intitive interactions teeing tombeton wontocontinue godusedtine could use to the M Jisud oped effectsopped Hequenterors good input sonativity

■ All ■ Non-Gamers ■ Gamers

Post-trial Gameplay Feedback



- Gameplay Evaluations
  - Low Error Rate
  - Enjoyable Gameplay
  - Symbols Recognizable
  - Audio not so well received

# Results





Comparison: SMARTsign & POPsign Retention

### Discussion



#### Improvements:

- Users Interested in more vocabulary, how to incorporate when media, memory resources are in conflict
- Tutorial, Instructions, or Hints don't detract from gameplay
- Need for better hand shape/pose detail or larger video pop-out





Start Popping!

Connect Current Sign Bubble to groups of 2 or more

Aim and Shoot by Tapping in chosen Bubble's direction

Stuck? Switch to Hint Mode



A Few Hints Switch between Current & Next Sign Bubbles by tapping (?)

Bounce off Walls for hard to reach spots

Check Options for more fun ways to play!





► Hint Mode

### Reiteration and Future Work



#### Continue to Improve App

- Two-Week Field Trial Comparison with SMARTsign App to Gauge Longterm playability and retention
- Evaluate potential Learning Outcomes based on anticipated increased "Time on Task"

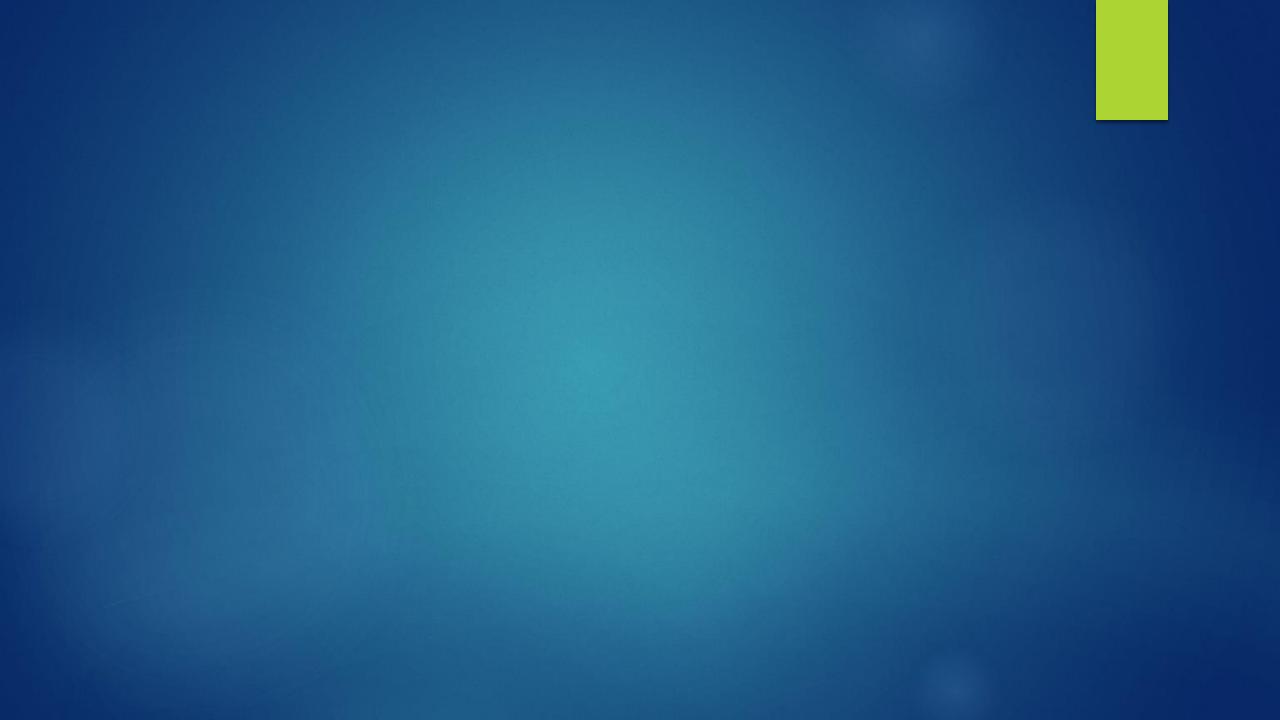


# Thanks!

Questions?

# Gameplay



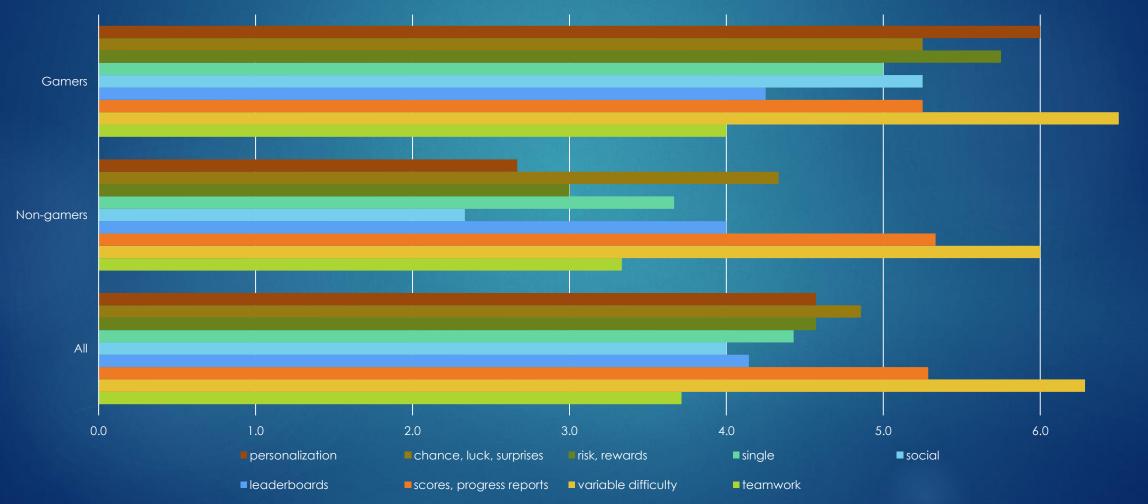


#### **Results** Gameplay Preferences



7.0

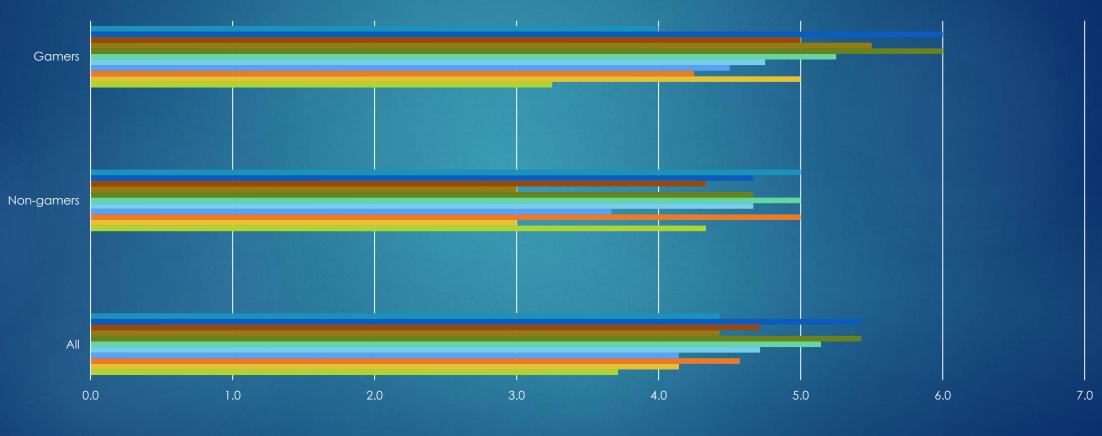
#### Value of Game Elements II - Gamers vs Non-Gamers



#### **Results** Gameplay Preferences



Value of Game Elements III - Gamers vs Non-Gamers



emotion immersion, flow escapism realism/fantasy mood scenery pace story, character, relationships humor mystery music