Learning Technologies: Supporting Word Reading Using Dual Language Vocabulary Apps

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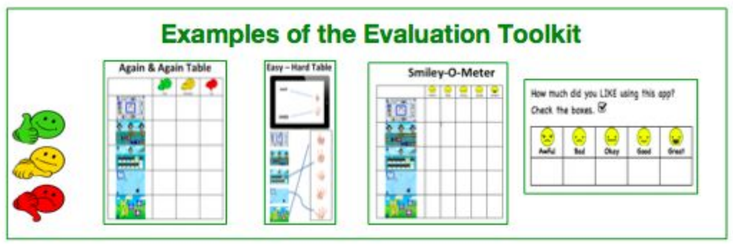
BACKGROUND

- Converging evidence demonstrates a strong association between signed language phonological awareness and reading (e.g., Holmer, Heimann & Rudner, 2016; McQuarrie & Abbott, 2013, 2010).
- Similarly, evidence from school-based intervention studies focused on signed language phonological analysis skills, suggest that Handshape (HS) categorization provides a powerful mnemonic supporting both sign and print word learning for young Deaf dual language learners (e.g., McQuarrie & Enns, 2015).
- This knowledge translation initiative aims to improve signed language phonological awareness and reading skills in young Deaf children through development of skill-builder learning games using touch tablet technology that is highly motivating, easily accessible, and transportable.

CO-DESIGN METHODS

- Deaf children (ages 6-13) partnered in the design process interacting directly with developers and researchers to inform design and affect project direction.
- We have completed several iterations of the apps' interfaces to adjust the language, challenge levels, and key visuals based on observation and input from the children in user evaluation prototype sessions.



APP DESIGN FEATURES

ASL Phonological Analysis:

- Handshape (HS) Family categorization.
- HS selection (Targeted practice).
- Challenge levels (Marked/Unmarked HS).
- Over 700 vocabulary words and images.

Gameplay Options:

- ***Picture mode:*** reinforcing sign phonology-semantic connections (i.e., Sign vocabulary learning).
- ***Text mode:*** reinforcing sign phonology - orthography connections (i.e., Print vocabulary learning).

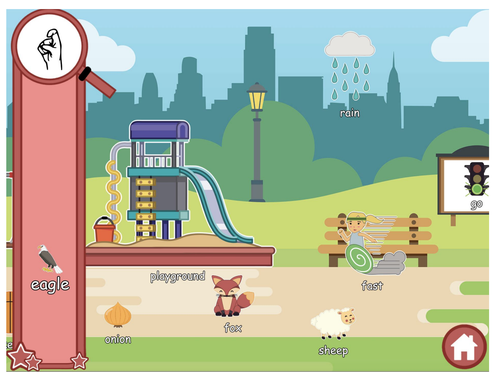
Scaffolding Support:

- Reinforcement of correct responses.
- Feedback/correction for incorrect response (i.e. showing correct HS for choice).
- Learning algorithms adjust speed of play based on the "spaced repetition" learning technique (calculated on number of correct versus incorrect answers).
- Engagement - progression through levels earns rewards.

DUAL LANGUAGE (ASL-ENGLISH) VOCABULARY APPS

EYE SPY ASL HANDSHAPES

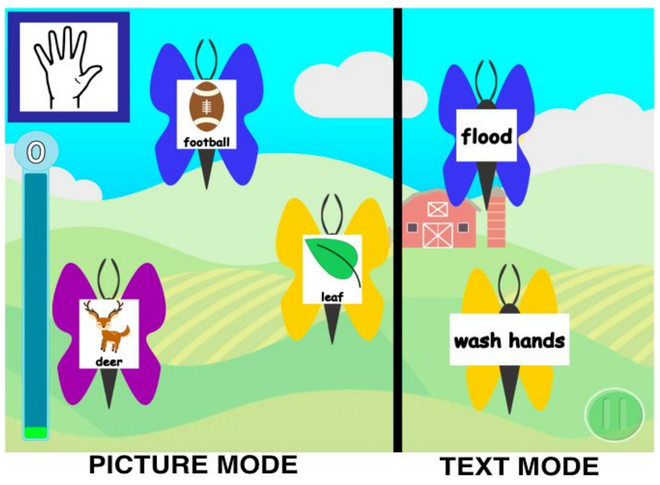
- Spot the images that match the target HS. Progression through story mode levels earns rewards.



STORY MODE

BUTTERFLY CATCHER

- Match HS and image/text pairs.

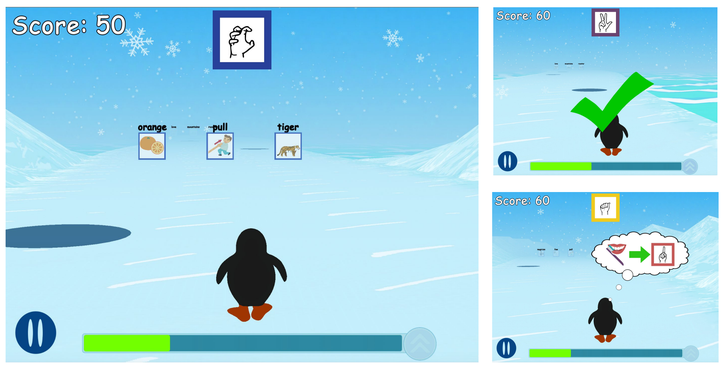


HUNGRY PENGUINS!

- Drag the fish to the correct HS to feed the penguins.

ENDLESS WADDLE!

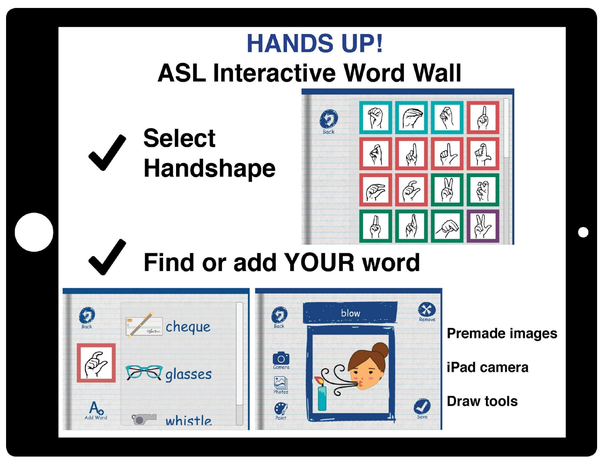
- Help Penguin select a sign made with the target HS. Swipe to move between 3 lanes, avoid obstacles, and jump over ice holes.



MEMORY MATCH!

- Match HS and image/text pairs.

HANDS UP! ASL WORD WALL



- Create multiple word walls to organize different subject area vocabulary (e.g., Science, Math). Play the Drag N' Drop game for vocabulary practice.
- Upon release, the digital tools will provide educators with much need resources to support students' early sign and print word learning.

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