Technology for Promoting Scientific Practice and Personal Meaning in Life-Relevant Learning

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Introduction

Policy makers and science educators advocate for "Science for all" (AAAS, 1990; NRC, 1996), but **traditional science learning is irrelevant, boring, alien, and disconnected** from learners' lives (e.g., Basu & Barton, 2007; Bouillion & Gomez, 2001; Lee & Fradd, 1998).

We have developed **Life-relevant Learning (LRL) environments** to help learners understand the relevance that scientific thinking, processes, and experimentation can have in their everyday lives.

Problem: We need to better understand the process and effects of incorporating the technologies that are already personally meaningful in learners' daily lives into learners' experiences in science.

Context of the study

Kitchen Chemistry is an informal LRL program held at a local private school. A total of nine learners (ages 9-13) participated in the program, six of whom participated consistently each day.

We aim to understand how the scaffolding for scientific inquiry and the support for telling personally meaningful stories in two mobile software systems, ***Zydeco*** and ***StoryKit***, influence learners' scientifically meaningful experiences.

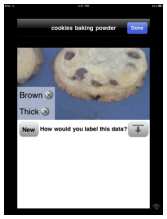
Research Question

How did Zydeco and StoryKit support or inhibit learners' scientific practice and their personal meaning?

Papers

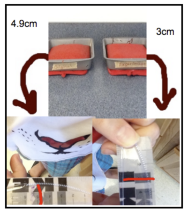
Clegg, T.L., Bonsignore, E., Yip, J.C., Gelderblom, H., Kuhn. A., Valenstein, T. & Druin, A. (2012, June). Technology for promoting scientific practice and personal meaning in life-relevant learning. *Proc. International Conference on Interaction Design and Children* (IDC).

Yip, J.C., Clegg, T.L., Bonsignore, E., Gelderblom, H., Lewites, B., Guha, M.L., & Druin, A. (2012, July). Kitchen Chemistry: Supporting learners' decisions in science. *Proc. International Conference of the Learning Sciences* (ICLS).



Zydeco

- Prompts learners to create tags of photo, video, or audio data that they capture.
- The tags and entries are added to their library of data for a particular investigation.



StoryKit

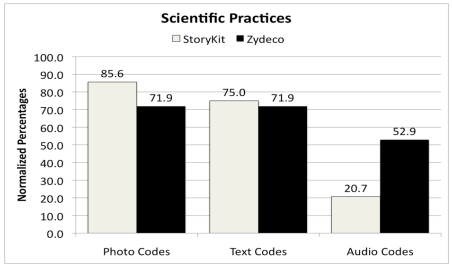
- Learners create electronic storybooks by typing in text, recording sounds, taking pictures, and/or drawing on the device's touch screen.
- They can also share their creations by uploading them to a server.

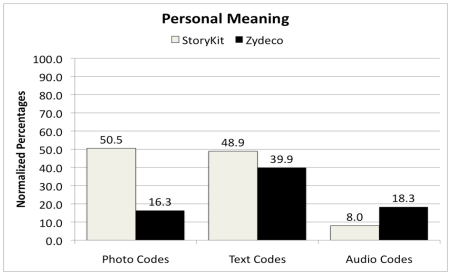
Methods

- **Data Collection** included stories and investigative reasoning artifacts that learners created using Zydeco and StoryKit during Kitchen Chemistry sessions.
- **Data Analysis** entailed a Grounded Theory approach. We developed an initial coding frame through open coding of a random 25% of artifacts that learners created. We compared, contrasted and adjusted these themes in individual learner creations, within sets of artifacts created with the same technology (StoryKit and Zydeco), and finally, across both technologies to establish the final coding scheme.

Findings

- Zydeco supported learners' scientific practice quite well.
- However, its tighter control of creation of artifacts limited learners' ability to integrate media forms.
- StoryKit enabled learners to create sequential and personal, free-form stories.
- However, there was no mechanism for helping learners to look at data collected across groups.





Implications and Future Work

- Technology for LRL must strike a balance between structured scaffolds and flexible, personalized designs to support learners' scientifically meaningful experiences.
- Based on this analysis, we are developing ***ScienceKit***, a mobile software system that combines the scaffolds needed to guide learners through the inquiry process and the flexibility to support learners' own personal interests