abstract

The outcome of a multidisciplinary and iterative process, the LIT KIT is a portable, cyber-physical artifact supporting children’s picture-book reading. The LIT KIT follows from the hypothesis that children’s literacy can be advanced in a tangible, co-creative environment that is both physical and digital. The LIT KIT employs color, sound and movement to scaffold meaning-making through the creation of an environment that is evocative of the picture-book being read. Designed with a Sifteo™ cube interface, the LIT KIT creates room-scaled audio-visual and spatial effects to both contextualize language and provide feedback during dialogical interactions between a child and an adult reader. Children can customize the LIT KIT settings to actively interpret the ideas, concepts and environments inherent in the picture-book’s words and images. The LIT KIT is an outreach component, for home or classroom use, of our developing room-scaled LIT ROOM for a major public library. Presented here are motivations for the LIT KIT, and an elaboration of its design and development.

components

The LIT KIT system employs lighting, undulating fabric streamers and sounds that a child can customize both during and after reading a picture-book. The primary components of the system include:

1. A central mechanism with four hinged, motorized [servo motor] panels, fabric streamers, LED lights, and an Arduino processing board;
2. Sifteo™ cubes, serving as the child’s interface with the LIT KIT system;
3. A laptop (not pictured), mediating between the Sifteo™ interface and the Arduino processor, and serving as the system’s speaker.
4. The LIT KIT is housed within a sleek, plywood lid that contains a compartment for books, the Sifteo™ cubes, the laptop, and instructions for the system’s use. The cover attaches to the base on four sides with clasps, and has a handle for carrying the system.

outcomes

The LIT KIT was evaluated by two 2nd grade classrooms, in whole-class and one-on-one read-aloud contexts with two picture-books, resulting in the following outcomes:

- Children and teachers rated the LIT KIT positively on measures of usability, environmental impact, aesthetic design and reading motivation / engagement.
- Of the three LIT KIT effects – lighting, movement and sound – children identified movement and lighting as being the most impactful in terms of contextualizing the language in the picture-books.
- Children in the study effectively represented the picture-book illustrations, concrete objects (such as trees) and abstract ideas (such as emotions) using the LIT KIT system.
- Children asked for a more robust palate of colors and sounds in the custom setting.

“I thought the LIT KIT was cool, like, that it was like a little game where at first you had to figure out one thing and then you hear a cool sound and it starts moving, kind-of what it looks like and it kind of gives you an image of what the book is.”

“I think the LIT KIT was really cool and fun and I actually think it would help with the pictures because sometimes when a teacher’s reading to me, like, I want to be able to see the pictures in my head and the LIT KIT really helps.”