Jabberstamp: embedding sound and voice in traditional drawings

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1   Introduction

Children in our culture are accustomed to creating people and things and places—with implied context—in their drawings. Since the first days they draw, parents will ask "who is that? Where are they? What are they doing?" From early on, children have learned through drawing to provide the information necessary for an audience to understand the story that is going on in their drawing. Conversely, learning how to contextualize an oral or written story in the absence of images is a much slower learning process for children, and children's ability to use language to communicate when and where their story takes place is considered a milestone in literacy development [Snow 1983].

Literacy education encompasses reading and writing, but most tools for literacy development address children's reading skills. Tangibles have been argued to support children's creative expression [Ryokai et al, 2004], and we are inspired to develop new technologies that leverage children's creativity and existing knowledge to make story creation, comprehension, and communication part of a child's ongoing intellectual life [Graves et al. 2004]. Our research builds on a history of interactive systems to support children's literacy through storytelling and drawing.

2   Approach

Jabberstamp is the first tool that allows children to synthesize their drawings and voices. To use Jabberstamp, children create drawings, collages or paintings on normal paper. They press a special rubber stamp onto the page to record sounds into their drawings. When children touch the marks of the stamp with a small trumpet, they can hear the sounds playback, retelling the stories they created.

In a series of studies, children ages 4-8 use Jabberstamp to convey meaning in their drawings. The system allows collaboration among peers at different developmental levels. Jabberstamp compositions reveal children's narrative styles and their planning strategies. In guided activities, children develop stories by situating sound recording in their drawing, which suggests future opportunities for hybrid voice–visual tools to support children's emergent literacy.

Children relate to their imagery using different strategies. All children, from 4–8 could name their iconic drawings. Children ages 5–8 work to evolve stories over time by integrating character voice, (direct speech) presenting them in the stories (quoted speech), and providing some contextual information (using a narrator voice). In addition to voice and narrative, children decorated their drawings by recording ambient sounds and inventing sound effects.

3   Implementation

Jabberstamp is built with a Wacom tablet, two wireless transmitters embedded in the trumpet and stamp tools, pre-printed paper templates, speakers, microphone and a PC. A Java application creates audio

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Figure 1: Two girls create an interactive story-game.

recordings, associates them with locations on the page, and manages threaded audio for playback. Paper templates are coded so that children can recall their work after it has been removed from the tablet.

4   Implications

A number of talking books entered the commercial toy market in the past eight years, coupling paper books with interactive recorded sound. Some aim to teach reading skills like phonics by delivering children pre–composed audio content. One can regard Jabberstamp as a contribution to our culture's transition from tools for consumption (TV) to tools for authorship (the www). We continue many years of research in creating digital media that prompt children's learning through self-motivated creative activities, following pioneering efforts such as those of Alan Kay [Kay 1972].

Professional educators remarked that Jabberstamp has potential to become a communication tool in the classroom. Children can create compositions that are much more complex than they can record with conventional media such as pencil and paper, and can allow children to capture and share intricate ideas before they have mastered the ability to write complex narratives.

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