



Incorporating technology in children's storytime: Cultural-historical activity theory as a means of reconciling contradictions



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1. Introduction

With the rapid evolution of information and communications technology (ICT), increasingly children own, access, and use new technologies (e.g., handheld devices) on a daily basis. Some scholars argue that ICT can have a negative impact on young children when used inappropriately, such as passive use of screen media or prolonged screen time (Anderson & Pempek, 2005; Cordes & Miller, 2000; Tomopoulos et al., 2010). Adult caregivers (parents, preschool teachers, and librarians) also question the appropriateness of handheld devices and related applications for children (Howard & Wallace, 2016; Kucirkova & Littleton, 2016; Paul, 2014b). The author's previous research revealed some concerns that Taiwanese parents had about the use of handheld devices with children, including child health issues (e.g., short-sightedness), and parents' lack of practical skills in selecting and using applications for or with children (Sung & Siraj-Blatchford, 2015; Sung, Siraj-Blatchford, & Chen, 2015). These studies adopted an action research (AR) approach, but the way in which study participants' interpretations and actions were culturally and historically embedded was not explored at that stage. The present study employs cultural-historical activity theory (CHAT) to understand contradictions that arise from children's storytime in a technology-rich setting. A storytelling program called *Winter Storytelling* hosted by a public library in Tainan, Taiwan, is at the center of the intervention.

2. Problem statement

The use of tablet technologies with children is an emerging area, and much of the current academic discussion lies in early childhood education, developmental psychology, and neuroscience. Little recognition

has been given to such studies in the library and information science (LIS) scholarly journal literature. A recent study that surveyed 415 libraries in the United States showed 71% of the participant libraries reported using new media (e.g., tablets, MP3 players, and digital recording devices) in their programs for young children (Mills, Romeijn-Stout, Campbell, & Koester, 2015). However, the survey did not provide in-depth information on how the new technologies were used in the libraries, how adults interacted with children, what conversations occurred, what adults' needs were for using technologies with young children, and what the impacts of using new technologies on early literacy were. Understanding these issues is important for library professionals to effectively develop collections, programs, and services that respond to adults' and children's needs. This study aims to support the library in creating a change to promote children's emergent literacy, using an early childhood ICT project as a catalyst. The core research questions driving this study are:

1. What were the contradictions arising from the inclusion of technology in children's storytimes?
2. How did the selected library promote its workplace learning among the librarian and library volunteers in order to fulfil its institutional objective of promoting children's emergent literacy?

3. Literature review

3.1. Cultural-historical activity theory

CHAT, as used in the present study, builds upon the work of Vygotsky (1978) and Leont'ev (1978) and provides a powerful tool for describing problems within cultural and historical contexts (Nardi, 1996). CHAT is practical and intentional as it focuses upon "doing in order to transform something", instead of doing as a disembodied action (Barab, Barnett, Yamagata-Lynch, Squire, & Keating, 2002, p. 78; see also Engeström, 1987; Kuutti, 1996; Nardi, 1996). CHAT has been used as an analytical tool to study learning experiences which involve technologies in the field of education (Barab et al., 2002; Issroff & Scanlon, 2002; Uden, 2007). In LIS, Wilson's (2008) review identified that little research has been conducted within a CHAT framework in the field, and proposed that CHAT would be appropriate for any investigation of library and information *practice*, which involves: "how things are done, how to do them more effectively or efficiently, and how to develop systems that support the doing" (p. 151). A rather isolated example is Meyers' (2007) employment of CHAT to model school library programs and practices.

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3.2. Children's storytime and public libraries

Storytimes are an established and trusted feature of public library services directed towards emergent literacy, defined as “the skills, knowledge, and attitudes that are presumed to be developmental precursors to conventional forms of reading and writing” (Whitehurst & Lonigan, 1998, p. 849). Frequent library visits with children are sometimes seen as an environmental indicator that could contribute positively to the development of emergent literacy (Payne, Whitehurst, & Angell, 1994; Sénéchal, LeFevre, Hudson, & Lawson, 1996). The link between library visits and emergent literacy development depends upon two conditions provided by library programs for children and their caregivers: a print-filled environment and a caring adult to introduce the child to the pleasures of literacy (Greene, 1991; McKechnie, 2006).

It is increasingly suggested that the use of new technologies can enhance preschool children's multimodal literacy practices (Marsh, 2004; Wolfe & Flewitt, 2010). Consistent with this finding, Farmer (2004) suggested that librarians incorporate technology in storytelling as a research tool, audio-visual aid, and communication vehicle which helps the storytelling process be more faceted, motivated and enjoyable. After modelling appropriate reading behaviors for parents and caregivers in traditional (print-based) storytimes, Guernsey (2014) suggested that children's librarians act as media mentors for children and their caregivers. The role of media mentors can be taken on by library professionals (Campbell, Haines, Koester, & Stoltz, 2015). However, facing an array of new digital resources intended for children, children's librarians may be confused about which digital tools are appropriate, and when and how such tools should be used (Farmer, 2004; Paul, 2014b). Professional literature has also documented some librarians' strong preferences for print books over electronic books for supporting emergent literacy (Kleckner, 2014; Paul, 2014a). Staying informed of emerging technologies is acknowledged as a competence for children's librarians in different professional guidelines by the American Library Association (Association for Library Service to Children, 2015) and the International Federation of Library Associations and institutions (IFLA, 2003).

3.3. Children and technologies

There is an emerging debate regarding the roles of digital or physical resources with young children. For example, some research has shown that electronic storybooks can help promote children's word comprehension and phonological awareness (Korat, Shamir, & Heibal, 2013), enhance children's story comprehension (de Jong & Bus, 2002, 2004; Verhallen & Bus, 2010), and engage with children more (de Jong & Bus, 2004; Moody, Justice, & Cabell, 2010). Other research studies that show positive outcomes from using educational tablet technologies for early learning are commonly underpinned by the developmental appropriateness of technology for children, and the pedagogical role of adults with children using technology (Beschorner & Hutchison, 2013; Falloon & Khoo, 2014; Kucirkova, Sheehy, & Messer, 2015). Furthermore, Bus, Takacs, and Kegel (2015), drawing upon engagement theory, explained that co-reading with adults can stimulate learning, because children can get tailored support from the adults as well as access to desirable interactive features.

4. Methodology

4.1. Philosophical rationale

An AR and participatory approach was adopted (Greenwood & Levin, 1998; Winter & Munn-Giddings, 2001). As Reason (2003, p. 104) argued, “the characteristic idea of philosophical pragmatism is that ideas and practices should be judged in terms of their usefulness, workability and practicality.” The purpose of AR was to “produce practical knowledge that is useful to people in the everyday conduct of their

lives” (Reason & Bradbury, 2001, p. 2). The author's goals were to work with study participants to ascertain what they themselves felt “worked”. This intervention study involved a cyclical process of “planning, acting, observing, and reflecting on the changes in the social situations” (Noffke, 1995, p. 2). Systematically following this cyclical process the author observed and recorded observations, reflected critically, and discussed and evaluated reflections, which assisted in modifying subsequent sessions in *Winter Storytelling*.

This study took a cultural-historical approach for analysis; this approach explains “the relationships between human mental functioning, on the one hand, and the cultural, institutional, and historical situations in which this functioning occurs, on the other” (Wertsch, del Rio, & Alvarez, 1995, p. 3). In this study, the children's emergent literacy was studied in the context of public libraries, whose cultural norms, institutional goals and historical background were also considered. The object of *Winter Storytelling* was to develop the competencies of the target group (i.e., a librarian and library volunteers) so as to facilitate children's learning collectively. Therefore, multiple perspectives were collected to help understand the dynamics of the whole library's activity system.

4.2. Setting, participants and source of materials

Data were collected from *Winter Storytelling* sessions hosted by Tainan Children's Library in partnership with the author. Tainan Children's Library, located in Tainan Public Library,¹ serves approximately 200,000 people in the cultural and educational area in Tainan, South Taiwan. Tainan Public Library is a free-standing building located in an established neighborhood within walking distance of the railway station. Since 2012, its children's services have been outsourced to the Hulu Alley Group, a non-profit voluntary organization. Due to the refurbishment work of the library, all data collection activities took place in a local bookstore which had a partnership with the Hulu Alley Group.

Each *Winter Storytelling* session included two parts: (1) storytelling and (2) story creation. At the beginning of each session, the librarian and the author asked children to take photos while a library volunteer delivered a story (labelled as the storytelling part). After that, library volunteers, children's caregivers or more capable peers (e.g., older siblings) worked with child participants to create stories using the photos taken, adding texts and recording audio narrations through the Our Story™ app on the iPad. Upon the completion of their story creation, children were asked to share their stories on the stage, which was followed by a Q&A discussion with their audience (labelled as the story creation part). At the end of each session, every child participant was expected to produce a digital booklet.

In each session, between 5 and 15 children participated in the storytelling part. Some of them voluntarily continued with the story creation part. Study participants in the story creation part included: children (five-to-seven years of age), a librarian (as the link between Tainan Children's Library and Hulu Alley Group), six library volunteers (the majority of whom are those children's mothers), and more capable peers. Occupations of the library volunteers included: elementary school teachers, cram school teachers (i.e., people whose job is to teach students to help them pass school examinations after school), and corporate assistants. A breakdown of study participant numbers is shown in Table 1.

The Our Story™ app (on the iPad) provides the capacity for story creation through pictures, videos, text, and sound. In the child-friendly interface of the Our Story™ app, there is a gallery of pictures and a storyboard at the bottom. The storyboard allows users to put digital pictures or videos into a sequence of book “pages” and for each page, users can insert text and record sound. Its features of personalization and open-ended content have been tested to promote children's exploratory talk, play, joint problem solving, creative expression, and

¹ <http://www.tnml.tn.edu.tw/>

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