

Reading Alone Together: Creating Sociable Digital Library Books

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ABSTRACT

Children between 10 and 14 years old continue to need support to develop advanced literacy skills but there is evidence that they may be reading less now. Libraries have long sought to cater to young adults but as more activities vie for the attention of children, the role of traditional libraries in the literacy lives of teens and ‘tweens may be diminishing. As Digital Libraries (DLs) begin to offer resources to children in this age cohort, it is important that they support more than convenient access to digital books. The DL must provide engaging reading and writing environments not simply to support the tasks of schooling but also to support literacy as a social practice. In this paper, we discuss the development and field testing of a “sociable digital library book,” an application that provides readers with the ability to leave notes and marks in a digital book and to share notes and marks with others. Our field study with a small set of Internet Reading Groups (IRGs) suggests that there are important pleasures to be had from “reading alone together.”

Keywords

Children, digital libraries, participatory design, sociable literacy, digital annotations

INTRODUCTION

Many fear that literacy is becoming an endangered set of skills, especially since children seem to be less engaged with reading for pleasure now than they were in past generations [14]. Making books widely available online makes it possible for children to have easy access to a wider selection of engaging texts, but access alone may not suffice. So many types of information and entertainment vie for their attentions and seem to be crowding book reading out. Moreover, at least for American children, the public library’s role in providing access and guidance for young adult readers also seems to be waning. Without easy access to books, the habits and pleasures of reading are

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likely to continue to decline but more than mere access may be necessary to engage the attention of today’s youngsters [9].

The International Children’s Digital Library (ICDL), developed at University of Maryland, College Park and Internet Archive, helps bridge the physical distance between children and libraries, making many types of books available to them from home or school. The ICDL project focuses on access and on support for reading, typically short picture books of the type most appropriate for pre-literate and very young readers [8]. However, both the content of its collections and its focus on the traditional role of the library as provider of access limit the ICDL’s appeal to middle-school children.

In the current implementation of the ICDL, reading the books is either a solitary activity or one that takes place with others who are co-present with the reader: a young child together with a parent or perhaps an older sibling sitting together in front of a computer screen. Our prior research suggests that pre-teens and young teens desire and expect more robust features for interacting with others as well as with the pages of a book [4]. Moreover, research has shown that “literacy is not a single unitary skill; rather, it is a social practice, which takes many forms, each with specific purposes and specific contexts in which they are used” [4]. After children have mastered primary literacy, usually between the ages of four and nine, schooling begins to focus on the pedagogies of active reading. Digital Libraries for middle school children will presumably need to provide support not just for children’s search practices [1], but also for a wide variety of active reading strategies. Although active reading strategies are often defined in terms of work products (highlighting and annotating in order to better understand complex material or to support writing a paper), active reading may also be involved in a variety of activities that support reading and writing in social contexts.

In their classification of literacy practices, [5] note that the earliest and some of the most formative literacy practices children encounter occur in the home. These practices, including reading bedtime stories, provide powerful support for social relationships. As children become more literate, practices that maintain and nurture social relations continue and are exemplified by activities like reading and writing notes to family members and friends.

A number of internet applications, of course, support many varieties of sociable literacy practices. Pre-teens and teens avidly use email, instant messaging, and chat utilities whenever they have internet access. They are familiar with a number of search engines and those who can use the World Wide Web frequently. None of these digital literacy practices, however, address more traditional reading and writing practices, especially those developed around books and the kinds of fiction teens and ‘tweens are most likely to choose for leisure reading. Applications that support sociable literacy within families and for informal groups or “reading circles” may enhance the attractiveness of reading as a leisure activity. This study explores one augmentation for online books that may introduce new pleasures while retaining the centrality of the book as a metaphor and an artifact in the practice of literacy.

RESEARCH QUESTIONS

Children 10-14 sharply differentiate between reading for school (work) and reading for pleasure (play). In their work domain, they probably differ little from their adult counterparts: they want tools to support real tasks, specifically the kind of homework assignments they typically face in middle school [9]. These tasks are generally defined by teachers and are constructed to allow the teacher to evaluate the processes and progress of each individual student. However much we might wish to see more collaborative learning taking place in middle schools, the dominant paradigm remains firmly in place.

Reading outside of school, that is reading for fun, is a less visible and largely unstudied activity. Our contextual studies, however, suggest that children in this age cohort do continue to read for pleasure and that they enjoy talking with others about books they have in common, although occasions to talk about books with friends and family members appear to be rare [9, 18]. To support sociable literacy practices in the context of a digital library, our Intergenerational Design Team (IDT), composed of eight children between the ages of 10 and 14 plus six adults, developed a prototype using interaction metaphors drawn from physical artifacts: chiefly books, rubber stamps, and sticky notes. The goal of these objects and interactions is to engage the social in support of reading as a leisure activity for ‘tweens and teens.

Of course many tools for online conversations already exist. Teens and ‘tweens are accustomed to using IM and chat sites while they accomplish other tasks on their computers. Yet IM and chat, as synchronous technologies, do not completely support sociable literacy practices while threaded discussion lists (bulletin boards), though asynchronous, divorce talk about the book from the book itself [2]. Using an annotation metaphor instead of chat or bulletin board metaphors offers key advantages. It keeps the book as the central focus and context of the conversation and it permits users to keep two sets of notes, private jottings for their own purposes and shared notes for constructing and sustaining social relationships around sharing the experience of reading.

Annotations of online readings have attracted significant research attention for almost 20 years [2, 11, 13, 15, 16, 20, 21]. Such work, however, focuses on the active reading practices of adults (typically college students or researchers). Both the reading and the writing activities in these studies arise from and usually support some form of collaborative work, from discussions of readings for course work to shared understandings of prior work in support of new research or writing in a work group [12, 15]. Children also need support for a variety of collaborative activities in online contexts [19], but their needs, or at least their desires, extend beyond school into their social worlds. To understand better how sociable features might change the practices of reading for pleasure among ‘tweens and teens, we developed a prototype for a sociable digital library book to support Internet Reading Groups.

In this early, exploratory phase, field testing of the prototype aims to address the following questions:

- Is sociable reading really attractive to teens and ‘tweens? To their families?
- What kinds of conversations or social interactions, if any, might a sociable digital library book encourage?
- Would expressive icons providing visual cues for different types of annotations be useful and if so how would they be used?
- Does reading with and writing to others for pleasure require different systems of support than reading and writing for collaborative work?

Designing Sociable Reading Tools



Figure 1: Participatory Design of a Sociable Book Interface

Growing out of earlier work with the readers in the ICDL, the prototype for the sociable digital library book has been developed using user-centered design methods, including contextual inquiry, low-tech prototyping, and participatory design [7, 10, 18]. These methods resulted in a set of key concepts for the sociable book (see Figure 1).

The tools must:

- support communications among several kinds of participants;
- support a range of active reading strategies with the virtual book;
- differentiate between private notes (or “nanowikis” [6]) for developing personal readings and public notes for creating a communal experience of reading and sharing;
- protect children from perceived dangers, restricting the sociable features to known groups, such as friends, families, schoolmates, or teachers.

THE SOCIABLE DIGITAL LIBRARY BOOK

Built with Flash™ and utilizing scanned book pages stored as jpgs, the tool follows the design philosophy of the ICDDL by preserving the general appearance and some of the affordances of physical books. The prototype is posted on a university Web server with password protection to ensure the privacy of participants. To work with the prototype, the participant must be registered with the system and access is confined to members of our IDT, their families and a few designated friends of the children. The application allows participants to make the text larger to improve legibility. A slider and two arrows beneath the book allow readers to move quickly to any page and to turn pages forward and backwards. Sociability is instantiated through tools for creating annotations based on two metaphors: the rubber stamp and the sticky note.

The interface provides three tools for managing annotations – a selector arrow, a hand for moving annotations, and an eraser for deleting annotations – and five “stamps” with which users can mark the pages of the book and add annotations (see Figure 2). To place an annotation on a page of the book, the user selects one five stamp types – a puzzled face with question marks floating above it to signify a question or a confusing place, a happy face, a sad face, a light bulb for annotations containing general ideas, and a large eye for annotations having to do with more careful or close reading. These types were developed through collaborative brainstorming with all the members of the IDT and the icons were also developed through collaborative design work.



Figure 2: Interface with Stamps and Stickies

After she selects an icon, the reader clicks on a spot on a page – either in the text or in a margin – where she wants to leave a mark or a note. A virtual sticky note appears beside the icon, inviting an annotation. The participant can, however, choose to leave the mark without adding any commentary. A lock icon in the upper left corner of the virtual sticky shows that the annotation and its iconic stamp are private. Operating as a kind of “nanowiki” [6] a private note can be edited or elaborated, its icon can be moved to another location, or it can be deleted. Once it becomes public, however, a stamp and its accompanying note can no longer be edited, deleted or moved. To make an annotation public, the participant clicks on the lock, opening it to signify that it will become public once the author closes the note by clicking the X in the upper right corner.

Readers from the same Internet Reading Group will see public icons as squared versions of the stamp tools. These icons can be anywhere – on the text or an illustration, on the cover or a blank sheet, or in the margins. If one or more icons block text (or illustration) from view, a reader can fade icons until they become light enough to allow the text underneath to be read. Icons “hold” notes that are hidden from view until a mouseover and/or click. Private notes are always visible only to their author.

FIELD STUDY

The IDT constructed six IRGs with one young IDT member, one or more parents of that child, and one of the child’s friends in each group. Most IRGs therefore began with three members, although two groups invited a few additional participants. Each member of each group registered a user name and a password with the team and received some written instructions detailing how to log in and how to use the tools. Participants were informed that members of their own IRG would be able to read the public notes written by other members of that same IRG but that people in other IRGs would not see each other’s notes. All IRGs, however, would be reading and socializing through annotations of the same book. Because we knew that experience with the prototype would be significantly affected by what we were asking participants to read, the IDT chose a well-known book popular with young adults.

IRGs were asked to read and write notes in the book as often as they were inclined to but we asked each person to try to read and work with at least the first four chapters (or 74 pages) so as to ensure an adequate test of the system’s performance and to allow the unfamiliarity of reading a book at a computer screen to diminish.

To provide technical support and to gain a sense of how sociable activities were operating in action, two senior members of the IDT were (mostly silent) members of all IRGs. Since it was not possible to shadow or observe people directly as they were using the Sociable Library Book, the database collecting the annotations also recorded dates and times of use and tracked paging behaviors.

In addition to the records captured in the database, we organized a structured opportunity for participants to provide feedback on their experiences with sociable reading.

As part of our standard show-and-tell for parents at the end of each semester, we asked both parents and children to engage in one of our regular participatory-design activities. Each participant was asked to jot down three aspects of the IRG experience they found fun, three they found challenging, and three ideas for improving the system. Each response was to be written on its own sticky note. All the notes in each category were posted on a large sheet of paper on the wall so that clusters of responses could be gleaned and gathered. The group then shared all the notes and engaged in a general discussion about experiences with the sociable book.

The experience of users as captured through the annotations were analyzed for rhetorical features and for “clustering.” Data captured by the system was culled for information about the number of pages each participant viewed, their activities as they paged through the book, and the amount of time each spent with the sociable digital library book.

RESULTS

The field study initially included 16 participants divided into six groups plus the two senior researchers. The field experience took place over four weeks, beginning on November 22, 2004, and ending on December 20, 2004. As expected, not all participants were technically able to use the system easily from home. One family’s computer needed to be repaired during the period of the field test. Because of the version of the operating system they were using on their home computer, another participant’s group could not install a Flash plug-in that would enable that group to use the system. A third group simply opted out. Of the 13 individuals in the three groups who did participate actively, 12 created at least one public note and one created two private notes but no public ones.

Analysis: marks and notes

In all, participants created 106 marks (stamps or stamps with notes). Authors deleted a total of 17 marks, but only two of the deleted marks had included substantive comments. Of the 89 marks and notes that participants opted to keep, 17 (19%) were private and 72 (80%) were available to others in the author’s IRG. This pattern differs markedly from the relationship between personal and public annotations in Marshall and Brush’s study [12], where “only a small fraction of personal annotations are made public online.”

A few particularly avid participants provided a disproportionate share of the marks and notes. One young IDT member left 10 public notes. Her IRG, consisting of herself and her two parents, was one of the most active overall, accounting for 22 of 59 public notes and marks. Her parents contributed equally, each creating six shared annotations. Another young IDT member left 18 public notes. His IRG included his mother and one of his friends. Although the adult in this group contributed four annotations, all of hers remained private (perhaps suggesting that she did not understand the distinction between public and private annotations or that she did not know how to make her annotations public). The friend

wrote six public notes but also created six private notes. This group accounted for 38% of all the marks and annotations in the system at the end of the field experience.

Rhetorical analysis of the notes reveals several suggestive and interesting patterns of social interaction. Some notes showed awareness of the social because the authors were asking for assistance from others. Two young readers used notes to ask for help with the meanings of words, one of them using this device three times. More interesting signs of sociable reading occurred in two of the three active groups. In one, a young reader and her parents exchanged several notes. One parent asked the child if the way she was participating was “right” (presumably she meant meeting the expectations of the design team). Anchoring her annotation with the “confused” icon, she wrote, “This is getting good [referring to the story]. Am I supposed to make comments like this or am I missing the point??? Someone help.” Her daughter responded about four hours later: “yes [Mom] make comments about the text not about random stuff.” And at another location in the book, the child observes, “beer yuck that is soo nasty.” Six days later, her mother catches up with the reading and replies, “How would you know what beer tastes like?”

In the most active IRG, the conversation was dominated by two boys, one a regular member of the IDT and the other his close friend who has since joined the IDT. These friends exchanged a large number of notes with each other, once addressing each other by name (see Figure 3) and on other occasions taking advantage of icon placement to create the sense of a conversation [3, 17] between them.

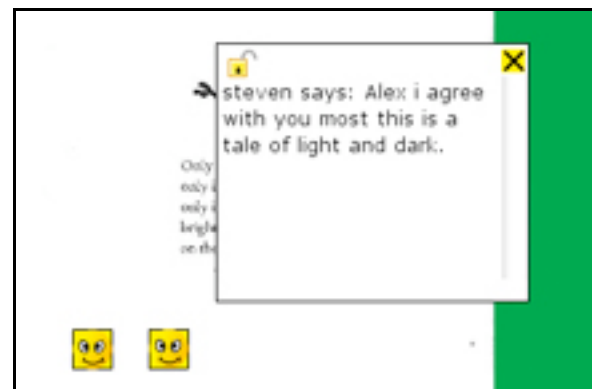


Figure 3: Conversation using Location and Direct Address

Participants used nearly the full range of expressive icons: three of the five types (happy face, light bulb, and question face) were used between 19 and 21 times each; the sad face was chosen 10 times. The large eye intended to signify that others should look closely at some portion of the book came into play only once. The spread of choices suggests at the very least that participants considered the choices meaningful, but our data do not support any conclusions about how readers perceived those differences when they encountered the different marks others left.

A content analysis of the annotations, both private and public, reveals that five of the 13 private marks had no content in their virtual sticky notes but that all public

annotations included commentary. Of the eight private annotations that included writing, two were marked as questions (although only one was phrased as a question); five used the happy face icon. The full set of notes contains a range of comment types, from remarks about the reader's feelings – for example, “wheww... it is good to know that he is o.k.,” “ewww.. it was almost like a real blood bath;” “Ooooooooooooo...this is getting scary...;” and “My god that is nasty!” – to jottings about the structure of the work. For example, coupled with the “idea” icon, one child participant wrote “starts character introduction” on the opening page of the book's first chapter.

A few notes might be considered “meta-comments” about the act of reading the book itself, including a few signaling (or feigning) weariness with the whole thing. For example, one of the boys wrote “no offense...but how many pages per chapter?” on page 23. Another boy noted on page 41, “Finally chapter three.” However, this child left his last note on page 86 (“hah Ged do you tink you can kill a dragon?”), suggesting that his virtual sighs about getting through the book might have been intended to signal a hip (and disengaged) attitude towards reading to the other members of his group more than an actual complaint about having to do so much reading.

Analysis: passive data and patterns

Both children and adults read sequentially most of the time. Most people began their sessions on the first page and then paginated page by page, sometimes very quickly. In later sessions, perhaps as he became more familiar and comfortable with the prototype, one child began using the page slider to jump to the point where he had last been reading. Most participants read 10-20 pages at a time. In our selection, most chapters were about 20 pages long. It appears that many readers worked in one-chapter chunks.

The data tracking usage demonstrates that participants had a high level of interest in the notes: most readers checked for and looked at annotations as they paged through the book to see what others had to say. The pattern is quite obvious: even the small sample from this first field study shows that readers are interested in both the comments and the text.

Feedback: sticky-notes

The responses of young IDT members and their reading group partners support the notion that sociable reading introduces a new dimension of fun and excitement to reading books. When asked to jot down three things that each person found “fun” about the experience of using the prototype, both adults and children noted a variety of fun elements including aspects of the book we'd selected to read (eight of 40 notes) and the look of the interface (eight notes). The largest cluster of notes about what was fun focused on the communicative and social features of the system: 15 of the 40 notes (37.5%) fell in this cluster. Of those, three highlighted reading the notes of others:

- “It was fun to read sticky notes”
- “Liked reading the other readers notes”
- “I like seeing what other people wrote”

Five focused on the full interaction between participants:

- “It is fun to talk to other people with stickys”
- “The sharing of notes with others in your group”
- “Communicate with others”
- “More fun to read with your kids. They make it more interesting”
- “Interactive and communication”

The majority of notes (46.6%) in this cluster, however, seemed to single out the ability to write notes:

- “It was fun to post sticky notes”
- “Can write notes”
- “You can write what you think about the book”
- “One can make his/ her idea or thought public”
- “Post comments which everyone can see”
- “I like that you can leave comments on there”
- “Instead of just having ideas in your head while reading, you can share your ideas with others”

The responses to requests for information about what made the experience challenging reinforced the sense that the application needs to represent many aspects of the social. For example, several notes pointed out that in the current interface it was hard to locate the notes others had left. Indeed, in the focus group discussion following the sticky-note session, this topic arose several times.

Feedback: group discussion

The discussion made clear that a truly sociable book will need to provide additional views of the book and the activities of its readers. For example, participants discussed how long notes might persist and what affordances the interface might offer for finding all notes, new notes, and notes authored by particular people.

Despite the need for improvements in the sociable book prototype, the discussion demonstrated that the underlying premise of the prototype was realized in its first use. Readers did begin to shift their attention back and forth between reading book and looking for signs that others were also reading and participating in the conversations. They experienced these shifts, however, not as a distraction from or a substitute for engagement with the story but as an invitation to deepen their engagement and their pleasure through sharing. This development suggests the potential power of sociable reading, or what we have conceptualized as reading alone together. One participant remarked “I liked the non-realtime conversation. You might forget your ideas, and not be able to talk about them later, but this way you could write them down and people could reply later.” Another suggested the pull of sharing: “Even if I'm not reading my favorite book, reading someone else's comment might zone me in, get my attention.”

CONCLUSIONS AND FUTURE WORK

The first field study suggests that:

- sociable reading can be attractive to ‘twens, teens and their families;

- a sociable digital library book can encourage (or at least permit) a variety of conversations and interactions among readers;
- expressive icons may well have salience in this context;
- reading with and writing to others for pleasure requires a different set of tools than other annotation systems developed for collaborative work among adults.

This last conclusion bears a little further analysis. The pattern in this study differs markedly from the pattern found Marshall and Brush's study [12]. A key reason for the differences may be the difference in context. In their study, only a small proportion of private annotations ultimately became public and those were heavily edited before they were published. In that study, annotations were created by students as part of a collaborative effort in the context of an academic endeavor. In our study annotations are made as part of a "fun" activity. Although the conditions under which the field study was conducted are somewhat contrived, participants had a lot of freedom to choose whether or not to engage in sociable activities and they experienced minimal repercussions if any for posting comments. Where there is a perceived social benefit (rather than a material, status, or academic benefit) for posting public comments, it seems reasonable to expect that most people will write most of their comments with the intention of sharing them. That, after all, is the whole point of the system.

One might therefore say that sociability especially in a protected environment encourages contributions of many kinds as there are no specific expectations or feared repercussions, only possible benefits. In contrast, a collaborative environment in which members are expected to make "useful contributions" forces a lot of self-reflection and perhaps even self-censorship, even if the group members are very comfortable with each other.

The primacy of social interaction is also reflected in the fact that readers in our study looked at most of the notes posted and did not concentrate on a specific area or topic as often happens in collaborative systems in which the focus is the end result of the collaboration and not the act of sharing itself. The differences in purposes and contexts for writing annotations suggest differences in the forms of interaction and their representation in the interface.

These conclusions remain more suggestive than definitive, however, because the field study was constrained by a number of issues, chief of which was the intrinsic artificiality associated with requesting that specific people make time in their routines at home to work with the application. Providing only one reading selection also created some problems for those who simply did not like the book. From the beginning of our work with this prototype, we suspected that until a book attracted a reasonable density of commentary and replies, the sociability the application is designed to support might be too weak to sustain itself and its users' interests for long.

Although this first field experience was too limited in scope to allow us to reach a firm conclusion, it did appear as if participants became more active when they saw others' activities and conversely grew somewhat discouraged if their notes did not generate interactions with others.

In the feedback about challenges and ideas for improving the system, we learned that for further work we will need to address problems with the legibility of scans and provide better technical support in the homes of children and their families. More importantly, our participants have helped us understand what additional affordances the system might need so that it will provide a richer representation of the social interactions that are possible with systems like this one. An overview representation of which pages contain notes, a system of notification for new notes, and filtering tools for viewing annotations by author as well as by placement in the text were thought to have potential appeal.

In the current phase of our work, we have created a larger IRG but are also providing two additional choices of books to read, titles chosen by the children and family members who participated in our first field test. We have added an email notification system and will be redesigning the interface to make the location of notes visible. A bookmark feature will also be added to make it easier for readers to return to the spot where they were last reading.

We will be looking further into the patterns that public and private annotations create and seeking new concepts to enrich the experiences of young readers. The first field experiment suggests some directions the Sociable Digital Library Book probably needs to take:

- Dictionary and thesaurus support
- Highlight tool
- Multiple views of other readers' activities

Future studies will include contextual inquiries with middle school teachers and with children's librarians both in schools and in public libraries and further field studies with children and adults who are not members of our IDT.

Although contemporary life in the US seems ever more dominated by information conveyed by video and multimedia, advanced literacy skills are likely to remain vital intellectual tools for centuries to come. As we build DLs, especially for public use and for children, we need to understand more fully what can drive engagement with texts, both those for school and work and those for pleasure and play. We will need to know more about how to support sociable literacy practices for 'twens and teens – how to support the fun of reading and add to the social pleasures that have traditionally surrounded reading. The Sociable Digital Library Book of our prototype begins to explore the space of annotations as a form of conversation with the self and others in the context of reading for fun.

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