Digital Tools for Peer-Based Reading Recommendations

A Case Study of Bookopolis

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Abstract: Learning to read is a fundamental academic skill that begins developing in early childhood. While there is extensive existing research that examines reading development as an individual skill, there is less research on how to nurture motivation and engagement to sustain reading development. In this mixed-methods study, we address this gap in the research by investigating 2 case studies of classrooms that use an online literacy tool, Bookopolis, to foster enthusiasm for reading in 3rd graders. Using analysis of both qualitative interview data and quantitative online recommendation data, we investigate questions of (a) what pedagogical choices teachers make to support the uptake of Bookopolis in their classrooms, (b) what Bookopolis features teachers found most useful, (c) how Bookopolis impacted students' early literacy engagement from the perspective of the teacher, and (d) what are the patterns of peer-to-peer engagement in the classroom. The findings suggest that teacher pedagogy and peer support are central to how Bookopolis is used in the classroom to foster engagement in reading.

Introduction

I saw kids choosing books differently. I saw kids who didn't read chapter books start to read chapter books, because their friends encouraged them. And because they were seeing what other kids were reading, they wanted to read what their friends were reading.

—Ms. R, third-grade teacher

Literally, that whole social aspect, I can't even tell you the fire it ignites. I don't want to say chaos and pandemonium it brings to a classroom, but it's like the classroom can be dead and then, it's coming alive like it's a carnival because they're all on Bookopolis.

—Ms. B, third-grade teacher

Background

Learning to read is a fundamental skill that is critical for academic success. It is also a challenging skill for many children to acquire, despite extensive research on its development. The most recent data from the National Assessment of Educational Progress showed that 64% of students score below proficient in reading (NAEP, 2015). Of that percentage, students from minority backgrounds or less affluent socioeconomic backgrounds obtain even lower scores on standardized reading assessments. To address this gap, basic reading skills such as phonological awareness are often a primary target of intervention (National Reading Panel, 2000). However, once competence develops in decoding, building expertise as a reader requires sustained engagement in the activity of reading both for pleasure and as a resource for learning. Recent data suggest that this is an important area to work on: The National Center for Education Statistics' (2013) long-term trend assessment obtained a large national sample of students and asked how often they read for fun, using the same question format to measure changes over time. This study found that the amount of time that young children spend reading has been dropping, and other

research suggests that variability in time spent reading is related to a number of factors, including the availability of books and reading partners (Common Sense Media, 2014).

Much of the research on reading has focused on its development as a skill (National Reading Council, 1998). There is less research on how to nurture motivation and engagement to sustain a child's reading development into eventual expertise, both as an individual capacity and as a shared activity within a wider community, despite studies suggesting that interest-driven reading can support learners with persistent difficulties in reading (Fink, 1995). There is also a particular need to understand the role of peers in supporting engagement in reading (Cooc & Kim, 2017). Previous research shows that engaging in collaborative, peer-based learning supports cognitive development, social development, and transfers in learning (Cohen, 1994; Olivera & Strauss, 2004). Further, peer collaboration can play a mediating role in enhancing learning and development for students who are lower performing (Cooc & Kim, 2017).

The following study addresses these gaps in the literature by investigating two case studies of classrooms that use online peer-recommendation tools to foster enthusiasm for reading in third-grade students. This study uses insights from the learning sciences and sociocultural perspectives to examine the role of one online tool, Bookopolis, in how children engage with reading across setting and time as it pertains to social interaction, meaning making, and interest development in a classroom community. Both teacher interviews and online peer-recommendation data are analyzed to provide portraits of the interacting roles of teacher pedagogy, peer interaction, and the affordances of Bookopolis in supporting engagement in reading.

Theoretical Framework

This paper will examine engagement in reading through the sociocultural approach, which considers three foci of analysis in research: personal, interpersonal, and community processes (Rogoff, Radziszewska, & Masiello, 1995). Rather than framing reading development as a passive activity contained within the individual, this study assumes that learning to read is constructed across all three planes. Furthermore, Rogoff's sociocultural framework defines the unit of analysis as an activity or event "with active and dynamic contributions from individuals, their social partners, and historical traditions and materials and their transformations" (Rogoff, Radziszwska, & Masiello, 1995, p. 1). This study will examine the individual, interpersonal, and community aspects of activity of using Bookopolis in the classroom.

Complementing sociocultural theory are ecological perspectives on learning and development (Bronfenbrenner, 1974) that highlight the multiple and sometimes complementary settings for learning that children spent time in. Networked technologies extend the possible contexts for learning activities, leading to elaborations of ecological frameworks to acknowledge that an individual's learning ecology encompasses "the set of contexts found in physical or virtual spaces that provide opportunities for learning" (Barron, 2006, p. 195). This learning-ecology framework further underscores the interrelated nature of learners and their environments in the process of developmental change, highlighting the role of interest in driving the creation of new activity contexts when resources are available (Barron, 2006). This study will examine the learning settings in two specific classrooms and the physical and digital resources intertwined in activity of engaging in reading for pleasure.

Research Questions

Using both qualitative interview data and quantitative web-usage data, this study will feature two illustrative case studies to investigate the following research questions:

- What pedagogical choices were made by teachers to support the uptake of an online literacy tool such as Bookopolis?

- What features of the online literacy tool do teachers believe support peer-based learning in their classrooms?

- From the teacher's perspective, how does the use of an online reading community impact the early literacy engagement of young children?

- What evidence of peer-to-peer engagement do we see from the online data?

Methods

Study Context

This study was conducted through a research partnership established with the founder and CEO of Bookopolis, Kari Riedel, who enabled participant recruitment and data collection. Bookopolis is an online reading community similar to Goodreads, but it is directed at children aged 7–12. On the "About" page of the website, Bookopolis is described as a "safe and fun online place for elementary and middle school kids to connect with other young readers about books and reading" (Bookopolis, 2017). Bookopolis offers online tools to serve the needs of both educators and students. For students, the features include: the capacity to make and receive book recommendations; maintaining digital bookshelves of books they have read, want to read, or are currently reading; a point-based system that tracks and rewards reading achievements; and an online reading community. For teachers, Bookopolis allows them to create a classroom community with the capacity to view bookshelves, book recommendations, book reviews, and other forms of online student activity.

Sampling

The research partner connected us to teachers based on geographic diversity, previous interest in being part of a Bookopolis study, and active website participation from their respective classrooms. Four teachers volunteered to participate with the understanding that no compensation would be offered since this is an exploratory study. We purposefully sampled two participants from these four teachers (Patton, 1990). This was done to focus more on the research questions around the social dynamics of Bookopolis and literacy engagement using similar cases. The selected teachers, Ms. B and Ms. R, both emphasized the in-class social nature of their Bookopolis experiences more prominently relative to the other two teachers. Ms. B and Ms. R also shared similarities that would make them more easily comparable as case studies, as they both taught self-contained classrooms of third- and fourth-grade students from socioeconomically diverse communities. In contrast, the nonfocal teachers had unique teaching situations in religious and affluent communities.

Characteristics of Focal Teachers and Their Settings

Both teachers, Ms. B and Ms. R, have extensive experience as classroom teachers. Both of their schools are situated in Northern California in different public school districts. They taught similarly sized classrooms of about 30 students, typically to a proportion of students who were socioeconomically disadvantaged and a proportion of students who were English learners. This information was extracted from interviews and validated using the School Accountability Report cards of the respective schools for the 2016–2017 academic year. More details can be found in Table 1.

	Ms. B	Ms. R
Teacher characteristics		
Grade taught	3rd, 4th	3rd
Amount of experience	25 years	12 years
Average classroom size	26-30 students	30 students
Classroom makeup	English Only & English Learner	English Only, English Learner, & Special Day
School characteristics		
Total students	496	700
Grades served	TK-5	K-8
Proportion of students identified as socioeconomically disadvantaged	45.1%	33.8%
Proportion of students identified as English learner	12.7%	22.4%
Proportion of students identified as those w/ disability	9.8%	13.4%

Table 1. Characteristics of case study teachers and their schools.

Qualitative Data Collection and Analysis

Four teachers were interviewed for about an hour, either in person or over the phone. Interviews were audio recorded and transcribed, resulting in nearly 100 pages of transcript. Each focal teacher was interviewed for about one hour, resulting in 42 pages of transcript. Interview questions were designed to be open ended and cover multiple topics: the teacher's personal learning trajectory in using digital reading tools, the teacher's experiences with Bookopolis, and the impact on student learning.

We began the data-analysis process by discussing and refining research questions with our research group. These research questions would be used to broadly frame the qualitative analysis that followed. We exhaustively open coded the transcripts in Dedoose, highlighting and memoing interesting points in the interviews that related to the research questions. After our first pass through the transcripts, we reviewed the codes that emerged, combined redundant codes, and organized them into parent codes by category: teacher pedagogy, student engagement and growth, student ownership, online features supporting social interaction, and community. With this preliminary codebook, we conducted a second pass of open coding through the transcripts. In order to conduct inductive thematic analysis, we exported and printed all codes and their associated excerpts from Dedoose. After systematically reviewing convergence and divergence in the data within code categories, we organized these iterations of convergence and divergence into larger categories. From that, we extracted the primary themes presented in the Results section of this paper.

Quantitative Data Collection and Analysis

Our community research partner provided extensive Bookopolis web-usage data from each teacher's class during the 2016–2017 academic year. For the purposes of this study, we analyzed a subset of the quantitative data that was most relevant to our research questions and to themes that emerged from the qualitative analysis. The social features of Bookopolis were a focal point both in our research questions and in the qualitative themes, so we examined the web-usage data indicating peer interaction—the data of the book recommendations that users made to each other within their online classroom communities.

The book-recommendation data listed every instance that a user recommended a book to another user during the 2016–2017 academic school year. For each instance, we received information on the date of the activity, the unique anonymized ID of the user who sent the recommendation, the unique anonymized ID of the user receiving the information, the message included with the recommendation, and the Amazon ISBN of the book. We used Gephi, a social network–data visualization tool, to examine the recommendation data. The purpose of these social network graphs was to illustrate the connectedness of peers within the online class communities based on their recommendation activity (Easley & Kleinberg, 2010). In this paper, we present the graph produced to illustrate reciprocal recommendations within students, in which the same students both send and receive recommendations to and from each other.

Results

Three primary themes emerged in the qualitative coding: the importance of pedagogical choices, the social features of Bookopolis, and significant changes in students' ownership and agency of reading and sharing books. The following case studies illustrate two ways that Bookopolis can be used in the classroom to not only accomplish pedagogical goals, but also to engage students with literacy practices at the individual, interpersonal, and community levels. They further provide illustrations of the learning ecologies of Bookopolis in the classroom. Table 2 summarizes key findings according to the research questions framing this study.

Case 1: Ms. B

Ms. B is a third-grade teacher of 25 years. When recalling her personal learning trajectory as a reader, Ms. B described growing up in a "dirt-poor" socioeconomic environment, identifying as a struggling reader until she found a book she loved, was able to access books via the local library, and socially engage with peers around that book. Ms. B's experiences paralleled her pedagogical choices, as she strongly believed in creating a love for reading by being nonpunitive, tying into students' interests, and offering them physical and digital resources for reading within those interests. In line with these goals, Ms. B sought out Bookopolis as a social networking tool for students to explore their interests in reading and socially connect to their peers in a reading community. To accomplish her teaching goals, Ms. B used practices of dedicated unstructured time, a combination of physical and digital tools, and providing multiple points of access to physical books. She found that the peer-recommendation features of Bookopolis were pivotal in achieving these goals and facilitating a peer-collaborative classroom, as students used Bookopolis recommendations to coordinate in-person joint activities around reading. Ms. B also found that social networking features of Bookopolis resulted in increased agency, ownership, and accountability in her students. As readers, her students felt empowered to be able to choose, recommend,

and rate books. As writers, her students felt accountable to the audience and peers they could influence through online discussion of these books.

Case 2: Ms. R

Ms. R is a third-grade teacher of 12 years. Before teaching, she worked in the health-care industry with a focus on technology training and support. These experiences reflected her philosophy that technology needed to be more than a replacement for something in the classroom, but rather a meaningful tool with a contextual goal. As a result, her pedagogical goal for using Bookopolis was to use technology to meaningfully engage with reading in her classroom community, particularly to provide a more meaningful use for reading logs. To accomplish her teaching goals, Ms. R used practices of dedicated unstructured classroom time to using Bookopolis, using reading logs, and giving feedback to students based on online contributions. She found that the peer-recommendation features were central in helping her students to explore more genres of reading, and that reading log features anchored more in-class discussion and engagement around reading. As a result of using Bookopolis, Ms. R observed profound differences in the way that her students engaged with Bookopolis as they took more ownership of their reading activities, more actively discussed reading in the classroom, and demonstrated improved writing. Like Ms. B, Ms. R found that the social networking features resulted in students' feeling more ownership as readers and empowerment as writers contributing to an online community.

Theme	Ms. B		Ms. R	
	Subthemes	**Selected Quotes**	**Subthemes**	**Selected Quotes**
Peda-gogical choices	• Provide students with books relevant to their interests to spark love for reading • Dedicated unstructured classroom time to using Bookopolis • Combination of physical and digital tools • Access to physical books	"That's important to know what's out there for reading for your kids, to be able to recommend a book based on a certain genre that they're interested in. If you're not doing that, you don't know about those books, then you can never create that passion in your students if you don't know what is out there."	• Teach students to use technology in a meaningful way • Dedicated unstructured classroom time to using Bookopolis • Meaningful reading logs • Feedback for students based on online contributions	"And the kids are expected to read for 20 minutes, and then they're expected to write a sentence or two. And then their parent signs it, and they bring it to me. And I personally have just always been really frustrated with that. I've not ever really seen the purpose behind it, and I've not seen a benefit. And so time for students is really precious in their homes, and I was looking for a way to make that time more valuable. And then in addition, one of the Common Core standards is to be using technology in a meaningful way. And so my thought was maybe there's a way I could pair those two things together."
Book-opolis features used	• Website book recommendation • Peer book recommendation • Visibility of peer and teacher bookshelves	"They'll message you. I love how they'll send an instant message to each other or I can send you a book recommendation. I can tell you, 'Oh, you know, I'm reading *It's Raining Cats and Dogs*,' or whatever book I could recommend to you, you know, *The Day the Crayons Quit*. I could recommend books to you or I could just be on there looking at your bookshelf without you even messaging me about a book or me messaging you."	• Website book recommendation • Peer book recommendation • Reading logs	"They could search for books in different genres, and I thought that that was all really powerful, because kids at third... Well, I think any grade, they get really stuck. They're stuck on *Wimpy Kid*. They're stuck on *Captain Underpants*. They're stuck on graphic novels. And I thought this is a way that their peers could say, 'Hey, I just read this book. I think it's great.'"
Student out-comes	• Genre exploration • Excitement about reading • Ownership and agency as readers • Increased accountability in writing	"Yeah, that accountability factor was like an eye-opener for them and I think it made the caliber of their writing better. It made them put more effort in. That was powerful for them to see books that I had read and rated as well."	• Genre exploration • Classroom reading community • Ownership and agency as reading • Increased accountability in writing	"And it seemed like it just gave the kids ... You know, because initially there's that silliness, but then they found the power. As you were saying, they found the power of their own words and their own opinions. They were able to share those with people. They could share them with me. Also this was their first year using Chromebooks, so it gave them a legitimate reason to be on a computer and to see the power, that they could use it for a communication tool."

Table 2. Summary of qualitative themes with selected quotes from interviews.

Peer-Based Reading-Recommendation Data

To investigate quantified measures of peer interaction on Bookopolis, we examined the peer-recommendation data for Ms. B's and Ms. R's classes from the academic school year of 2016–2017. For Ms. B's classroom, the date ranges showing recommendation activity were 9/6/16–10/6/16 and 4/18/17–6/2/17. For Ms. R's classroom, the date ranges showing recommendation activity were 3/30/17–6/1/17. The data collected online show extensive recommendation activity in both classes: Ms. B circulated 169 books with 3,215 recommendations, and Ms. R's class circulated 137 books across 1,743 recommendations; 100% of students in both classes sent recommendations to their peers. However, not all students were included in receiving recommendations. In Ms. B's class, 82% of students had mutuality in their peer book recommendations, and in Ms. R's class, 81% of students had mutuality. Furthermore, there was huge variation in the amount of recommendations that students received or sent (see Table 3). Variations in these patterns are visualized using social network visualization (Figure 1).

	Ms. B	Ms. R
Book recommendations sent		
Range	53-105	12-137
M	85.52	59.00
SD	10.71	20.10
Book recommendations received		
Range	0-635	0-279
M	97.12	67.04
SD	138.36	96.49

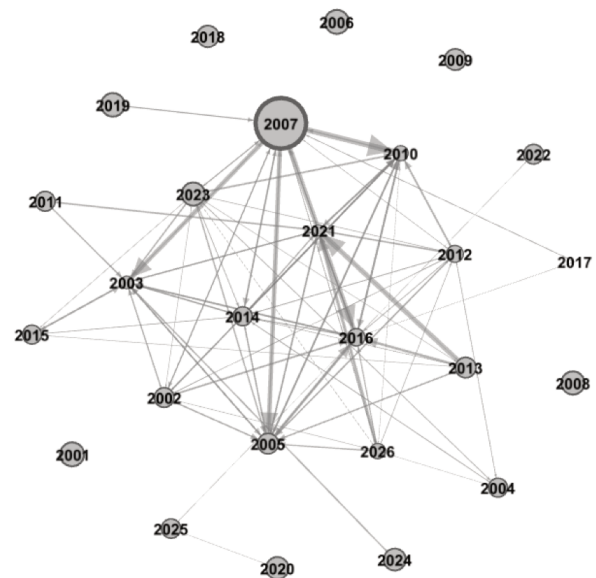*Table 3. Range, mean, and standard deviation of book-recommendations activity.*

Figure 1. Social network recommendation visualizations of mutual book recommendations.

Individual students are represented as nodes with anonymized labels. A larger node means that this student received larger number of recommendations. The range for the node size is set as 2–60, meaning that students with fewest mutual recommendations are represented with a size of 2 and students with the most mutual recommendations are represented with a size of 60. The links between nodes represent the recommendations sent out, with the head of the arrow pointing at the recipient. Links are displayed only if students have a reciprocal recommending relationship.

Discussion, Limitations, and Conclusions

In this paper, we presented two case portraits of teachers using Bookopolis as an online reading tool to achieve their respective pedagogical goals. The analyses highlighted the critical importance of peer interaction and the role of the teacher in supporting an online reading community. According to the qualitative results, Ms. B and Ms. R observed shifts in how their students engaged with literacy, mainly because Bookopolis was used to foster a peer collaborative learning environment both in person and online. These teacher interviews also revealed that social media tools such as messaging, sending

recommendations, and viewing each other's bookshelves encouraged students to have meaningful and exciting social interactions around reading in the classroom. Bookopolis was not a stand-alone tool; the pedagogies of Ms. B and Ms. R framed the rich learning ecologies that emerged from using Bookopolis in the classroom. Further, as a result of the combination of teacher philosophy and the social affordances of Bookopolis, both teachers perceived that students took on more ownership and agency as readers, as reflected in the way students engaged with reading through discussion, book selection, genre exploration, and writing. The analysis of the peer-recommendation data showed that students were active as recommenders and receivers, though there was wide variability in this activity. This variability is possibly driven by friendship groups, or popularity and perception of reading levels or interest in reading (Cooc & Kim, 2017).

The results point to social digital tools such as Bookopolis as promising means for creating a social reading community within a classroom and nurturing sustained motivation and passion for reading in students, coupled with the appropriate teacher pedagogy. However, this study is not without limitations. The small sample size did not showcase how Bookopolis might be used with different pedagogical choices or with more diverse learners. Additionally, limited collection of online usage data prevented deeper social network analysis of peer-to-peer recommendations. Future research will recruit a larger sample of more diverse classrooms, as well as examine the role of peer interaction and how it influences students' uptake of books on Bookopolis.

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