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Talking to Learn in the 21st Century:  
A National Study of Digital and Face-to-face Talk in K-12 Classrooms

by

Jennifer M. Higgs

A dissertation submitted in partial satisfaction of the

requirements for the degree of

Doctor of Philosophy

in

Education

and the Designated Emphasis

in

New Media

in the

Graduate Division

of the

University of California, Berkeley

Committee in charge:

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Professor Kimiko Ryokai

Summer 2017

Talking to Learn in the 21st Century: A National Study of Digital and Face-to-face Talk in K-12  
Classrooms

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## Abstract

### Talking to Learn in the 21st Century: A National Study of Digital and Face-to-face Talk in K-12 Classrooms

by

Jennifer M. Higgs

Doctor of Philosophy in Education

and the Designated Emphasis in New Media

University of California, Berkeley

Professor Sarah Warshauer Freedman, Co-chair

Professor Jabari Mahiri, Co-chair

Research has established the central role of high quality discussion in the developing understandings of readers and writers (e.g., Applebee, 1994; Freedman & Delp, 2007; Nystrand, 1997). Studies particularly have focused on the promise of dialogic teaching, or instruction that provides students with ongoing opportunities to engage in “talking to learn” (Britton, 1989). With the increasing popularity of collaborative digital technologies in K-12 spaces, classroom talk has expanded into digital settings. However, the relation between learning and digital talk—what I refer to as the interactive written communication via signs and symbols that occurs in networked online spaces—is less clear. On one hand, research suggests that digitally mediated discussion in K-12 classrooms fosters critical thinking, collaboration, and new spaces for productive dialogue. Yet, there is also substantial evidence that teachers struggle to use collaborative digital tools in ways that support student interaction and learning.

This study works at the intersection of these tensions to provide what is, to my knowledge, the first scholarly examination of digital talk as a learning resource in and across K-12 classrooms nationwide. Drawing on sociocultural frameworks (Bakhtin, 1981, 1986; Engeström, 1987; Vygotsky, 1978), it uses mixed methods to examine classroom uses of Subtext, a popular e-reader that supports discussion inside e-texts, as a case to reveal issues related to digital talk. It aims to shed light on (a) discourse features of classroom digital talk, (b) the social and cultural contexts that mediate it, (c) online and offline practices that influence it, and (d) relationships between types of digital talk and types of learning.

The study integrates multiple levels of analysis, including survey and design-based classroom research. Data include survey responses completed by 451 K-12 Subtext teacher-users and systematically collected records from design experiments with an elementary school teacher and a high school teacher who worked with me to design and implement instructional practices aimed at encouraging dialogic student talk across face-to-face and digital learning contexts.

A central finding from the survey is that while nearly 83% of the participating teachers viewed digital talk as a tool that offered more opportunities for student voice, the top reported

uses of Subtext indicate a disconnect between teachers' reasons for using the app and their actual use of the app with their students. Most participants reported using digital talk as a teacher tool for teacher-initiated communication rather than as a student tool for student-posed questions and student-led engagement with peers. The gap between teachers' uses of Subtext and their perceptions of its affordances and constraints suggests a tension between the intended learning opportunities associated with digital talk and the reality of implementing digital talk with students.

Findings from the design collaborations highlight how talking to learn in the 21st century happens in and across complex social ecologies. The elementary school teacher and I explored how her fourth- and fifth-grade students' interactions in Subtext might support their developing understandings of the concepts of main idea, voice, and theme. Over the course of four iterative design and reflection cycles, the following "humble theories" (Cobb et al., 2003) emerged about digital talk that supports the learning of disciplinary knowledge: (a) student-to-student digital talk can help mediate a sophisticated understanding of disciplinary knowledge (e.g., the literary concept of theme) if a teacher organizes learning in ways that establish a strong conceptual foundation and explicit interactional expectations, and (b) digital talk can afford a transparent tracking of students' developing conceptual understandings, making it possible for teachers to make accurate adjustments aligned with learning needs. Over the course of two cycles of iterative design and reflection with the high school teacher to shift digital talk practices, the following theories of learning emerged about digital talk in the classroom: (a) learning opportunities mediated by digital talk depend on how practices around it are socially organized, and (b) in order to support dialogic digital talk, organization of learning must account for the mutually influential nature of digital talk and face-to-face talk. Additionally, my design work with the high school teacher revealed that he felt most comfortable implementing instructional innovations with which he already had some familiarity and positive association.

The findings from this study have implications for research and practice. From a methodological standpoint, they highlight the necessity of researchers engaging in true partnership with teachers when designing "in the crucible of the classroom." Design collaborations are always "contested terrains, full of resistance" (Engeström, 2011, p. 3). It may be tempting for some design researchers to define what knowledge means and the kinds of change that are valued and implemented, but engaging in authentic partnership, I would posit, means that "what works" in the classroom cannot be determined without a teacher's co-participation and co-design. With regard to practical implications, recognizing the fluidity and reciprocal nature of digital and nondigital practices may help practitioners leverage the available tools and identify possibilities for learning. Furthermore, the dialogic nature of digital and face-to-face talk suggested by this study's findings calls for increased attention to the education of in-service and pre-service teachers regarding classroom talk. With more talk opportunities available in face-to-face and digital settings, teachers need robust, ongoing supports to prepare their students to participate in dialogic learning. These include lenses to critically evaluate tool affordances and constraints relative to their pedagogical goals, explicit training in learning theories to ground dialogic planning and instruction, and access to practical tools that bring those theories to life in ways that account for teachers' experiences and for the local contexts in which they teach.

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## CHAPTER 1: INTRODUCTION

Speech unites the cognitive and the social. The actual (as opposed to the intended) curriculum consists in the meanings enacted or realized by a particular teacher and class. In order to learn, students must use what they already know so as to give meaning to what the teacher presents to them. Speech makes available to reflection the processes by which they relate new knowledge to old. But this possibility depends on the social relationships, the communication system, which the teacher sets up (Barnes, 1974, p. 1).

British literacy researcher Douglas Barnes shared these observations over 40 years ago, articulating the then-burgeoning interest in classroom talk as a learning tool embedded in and shaped by particular social contexts. In the intervening decades, studies of classroom communication systems—the situated reading, writing, and talk that comprise idea exchange and meaning making—have established the central role of high quality discussion in the developing understandings of readers and writers. In particular, researchers have focused on the promise of dialogic teaching, or instruction that provides students with ongoing opportunities to engage in “talking to learn” (Britton, 1989) rather than talking to display knowledge. Dialogic teaching is cumulative in that teachers and students collectively build on each other’s ideas, and it is also reciprocal because teachers and students share ideas in response to and anticipation of other ideas (Alexander, 2008). Studies have linked dialogic classroom talk with gains in reading comprehension, literary analysis, argumentative writing, and learning engagement (e.g., Applebee, 1994; Applebee, Langer, Nystrand, & Gamoran, 2003; Boyd & Markarian, 2015; Langer, 2001; Murphy, Wilkinson, Soter, Hennessy, & Alexander, 2009; Nystrand, 1997). Researchers have also noted that dialogic approaches, which frame cultural and social diversity as learning resources, can support more equitable and inclusive classroom environments and advance the goals of democratic participation and civic engagement (e.g., Freedman, Delp, & Crawford, 2005; Gutiérrez, 1994; Juzwik et al., 2013; Paugh, 2015).

With the rise of collaborative digital technologies in K-12 spaces, such as Edmodo, Diigo, Twitter, YouTube, and Reddit, classroom talk has expanded into digital settings. However, the relation between learning and digital talk—what I refer to as the interactive communication via signs and symbols that occurs in online spaces between two or more participants—is less clear.<sup>1</sup> On one hand, research suggests that digitally mediated discussion in K-12 classrooms fosters critical thinking, collaboration, and new spaces for productive dialogue (e.g., Bailey, 2009; Grisham & Wolsey, 2006). Yet, there is also substantial evidence that teachers struggle to use collaborative digital tools in ways that support student interaction and learning (e.g., Hutchison & Reinking, 2011; Project Tomorrow, 2009; Reich, Murnane, & Willett, 2012).

This study works at the intersection of these tensions to provide what is, to my knowledge, the first scholarly examination of digital talk as a learning resource in and across urban, suburban, rural, private, and public K-12 classrooms. It aims to shed light not only on discourse features of classroom digital talk but also the social and cultural contexts that mediate

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<sup>1</sup> While many technologies exist that support spoken conversations over the internet (e.g., Skype), the primary modality of online exchange is writing. It is this exchange via written communication that I refer to when I use the term “digital talk.”

it and the relationships between online and offline practices that influence the interactional accomplishment of meaning. It further aims to examine connections between types of talk and types of learning. As digital talk gains traction as a tool that can mediate learning and future opportunities, it is critical that researchers and practitioners develop stronger understandings of how its use is organized, the afforded communicative possibilities for learning, and the ways in which digital talk is embedded in the practices of everyday classroom life. It is also necessary to identify conceptual and practical tools (Grossman, Smagorinsky, & Valencia, 1999) that can help teachers develop instructional practices that enrich digital talk as an interactive site where the resources that learners bring with them provide openings for new understandings to emerge.

Leveraging analytical opportunities afforded by multiple data sources, this study aims to build on and extend what we know about face-to-face classroom talk in our digital age, with a particular focus on learning and teaching with digitally mediated discussions in the English language arts (ELA). In order to accomplish these research objectives, my study design integrates multiple levels of analysis, including survey and design-based classroom research. Data include survey responses from 451 K-12 teachers and systematically collected records of design experiments with an elementary school teacher and a high school teacher, who worked with me to further explore the most effective ways to integrate digital and face-to-face talk. In the rest of this chapter, I lay the groundwork for this study.

### **What is Digital Talk?**

It is well established that the large and growing role of new media in all areas of modern life has dramatically changed how we read, write, and communicate (Castells, 1996; Freedman, Hull, Higgs, & Booten, 2016; Jewitt, 2008). The increasingly complex communication demands of our “world of constant change” (Thomas & Seely Brown, 2011) have prompted educators and policymakers to call on teachers to develop competencies that are attuned to new social and technological contexts. These competencies, also referred to as 21<sup>st</sup> century skills or 21<sup>st</sup> century literacies, include critical thinking, complex problem-solving, collaboration, and multimedia communication (e.g., Collins & Halverson, 2009; Jenkins, Purushotma, Weigel, Clinton, & Robison, 2006; Morrell, Dueñas, Garcia, & López, 2013; National Education Technology Plan 2016; New London Group, 1996). The National Council of Teachers of English (NCTE) position statement on 21<sup>st</sup> century literacies, for example, notes that “the 21<sup>st</sup> century demands that a literate person possess a wide range of abilities and competencies” that include technical fluency, audience awareness, analyzing multiple streams of information, and creating and critiquing multimedia texts (see ncte.org). The Common Core State Standards, adopted by 42 states and the District of Columbia as of November 2016, promote a similar vision of K-12 English language arts instruction that offers students ongoing opportunities to engage in conversations and collaborations and share their understandings across diverse modes (National Governors Association, 2010).

In response to changing times, if not to changing educational standards, many teachers are using digital tools in their classes. English education researchers have documented various new media in classrooms, include blogs (e.g., McGrail & Davis, 2011), wikis (e.g., Luce-Kapler, 2007), online discussion boards (e.g., Grisham & Wolsey, 2006), instant messages (e.g., Sweeney, 2010), email correspondence (e.g., Kinzer, 2005), podcasts (e.g., Vasinda & McLeod, 2011), digital gaming environments (e.g., Mahiri, 2011), digital stories (e.g., Hull, Stornaiuolo,

& Sahni, 2010; Kesler, Gibson, & Turansky, 2016), multimodal literary responses (e.g., Curwood & Cowell, 2011), and social networking sites (e.g., Hull & Stornaiuolo, 2014). Are the products and processes of meaning making with these digital media all forms of digital talk?

To put it simply, no. While the processes and products achieved through these media are forms of digitally mediated communication, digital talk and digitally mediated communication are not synonymous. Rather, I view digital talk as a category of the latter. Drawing on constructs from Conversation Analysis, I define digital talk as communication via signs and symbols in online spaces that is characterized by interactivity between two or more participants in a conversation, or an everyday exchange of talk (Sacks, Schegloff, & Jefferson, 1974). As the features of digital discourse are contingent on audience, purpose, and use (Eldred & Fortune, 1992), what digital talk “looks” like is not particular and predictable.<sup>2</sup> What identifies digital talk as such is interaction via turn-taking, or the contingent connections between what one participant does and what the other did in their prior turn, and the contingencies one turn creates for a responsive next turn. These strings of connected turns, which are “context shaped and context renewing” (Heritage, 1984, p. 242), comprise the interactivity that is central to digital talk. This is not to say that turn-taking in digital conversations mimics face-to-face turn-taking; digital interactions are delayed by seconds, hours, or days (for example, think of how people interact through Twitter), so the overlaps and interruptions that are often present in speech are absent in digital talk. Nonetheless, the notion of turn-taking translates from face-to-face to digital settings as a touchstone of interactivity, and it also acts as a criterion that distinguishes digital talk from other forms of digitally mediated communication such as multimodal literary responses.

Although this study explores digital talk with an emphasis on its use in language arts classes, I am not suggesting that digital talk is a tool only suited for the language arts. Understanding how teachers and students communicate via digital talk in the language arts may also help advance understandings of participation, learning, and pedagogy in other disciplines and for popular educational venues that depend heavily on digital forms of written communication, such as MOOCs (e.g., massively open online courses such as those offered by edX and Coursera). My hope is that my definition and research findings will add to a theory of digital talk and therefore be useful to researchers and practitioners in a variety of disciplines.

### **Theoretical Framework**

My theoretical orientation to language and learning suggests that digital talk is best understood using sociocultural theories that connect the two (e.g., Leont’ev, 1981; Vygotsky, 1978). Important to these theories is the point that all learning is located in consequential social,

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<sup>2</sup> In *Language and the Internet* (2001), linguist David Crystal argues that “Netspeak” is the result of Internet genres (e.g., emails, chat groups, instant messaging) interacting with how people use language. After comparing the differences between speech and writing and then comparing “Netspeak” with speech and writing, he concludes that although Netspeak is better understood as “written language which has been pulled in some way in the direction of speech than spoken language which has been written down” (p. 51), its novel uses of spelling, punctuation, and symbols (e.g., emoticons) make it a “third medium” (p. 52). I use the term digital talk instead of Netspeak because I have not found that digital conversations in classrooms fit Crystal’s notion of a third medium. In fact, in an earlier study of teachers using digital talk with their students, my colleagues and I found that teachers banned students from using symbols, abbreviations, and all-caps (all capital letters) (Higgs, Miller, & Pearson, 2013).

historical, and cultural contexts and is mediated by cultural tools both material, such as computers, and psychological, such as language. The centrality of the sociocultural world and cultural tools as mediators of human action and meaning-making remain relevant framing concepts for understanding digitally mediated communication as the product of interacting digital and nondigital systems. Following sociocultural approaches, I understand digital talk, like face-to-face talk, as consisting of culturally contextualized social practices driven by the values and assumptions embedded in the organization of those practices (Cole, 1996; Engeström, 1999; Leont'ev, 1981).

The overarching objective of this study is to better understand the relation between learning and digital talk. Vygotsky's (1978) fundamental insight that higher mental functions are always mediated by cultural tools/symbolic means provides the theoretical grounding to examine this relationship. For Vygotsky, the concept of mediated action explained human activity as a semiotic process between subject (individual), object (goal), and mediating tool(s) that we can use to alter our inner worlds as well as the world around us (see Figure 1.1). He argued that an individual's actions toward a goal are always mediated by material or ideational tools. Further, these three components are dialectically related and can influence each other as well as the entire activity.

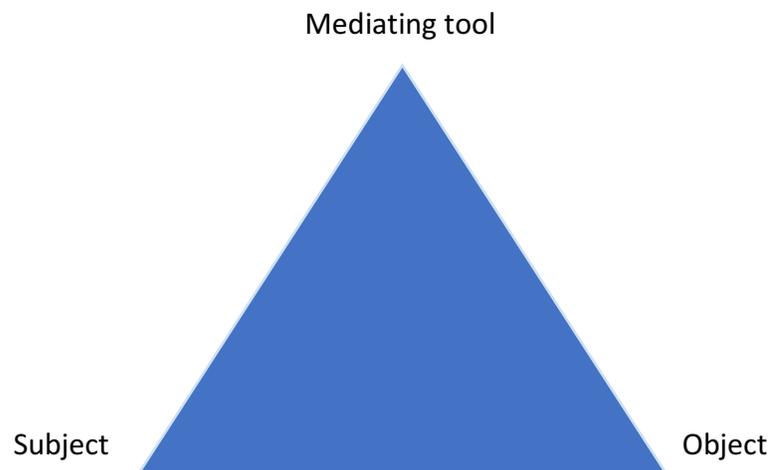


Figure 1.1: Vygotsky's (1978) mediational triangle

The concept of tool mediation counters technological determinism by foregrounding the notion that tools that can mediate higher order thinking—such as digital talk—may function differently in different sociocultural settings. In other words, it is understood that practices around a tool are shaped by the ecology in which the tool is embedded. Some proponents of educational technology ascribe a great deal of agency to new available tools, going so far as to suggest that they can “fix” education, but tool mediation focuses our attention on the construction of knowledge that takes place as humans use and produce tools, digital and nondigital, to achieve particular goals in particular ecologies.

Understanding some of the ecological<sup>3</sup> factors that can mediate digital tool use is another goal of this project. Third generation cultural historical activity theory (CHAT) offers a robust framework for understanding the diverse and interwoven factors that shape digital talk-mediated learning activity. The five principles of cultural historical activity theory guide my overarching approach to digital talk as a phenomenon as well as my analyses of my design work around digital talk with teachers, as described in Chapters 4 and 5. Briefly, the five principles (Engeström, 2001) hold that:

1. A collective, object-oriented, and artifact-mediated activity system is the central unit of analysis. Activity is defined as a coherent, stable, collaborative effort over time that is directed toward an object (goal) and comprised of many individual and collective actions over time.
2. All activity systems are polyphonic or multivoiced. Drawing on Bakhtin's (1981, 1986) insights, CHAT scholars argue that an activity system "is always a community of multiple points of view, traditions, and interests" (Engeström, 2001, p. 136). The struggle between different viewpoints can lead the way to "new ways to mean," or what Bakhtin (1981) refers to as ideological development (p. 346).
3. Activity systems are shaped and transformed over time, and the objects, actions, and ideas in a given activity system must be historicized.
4. Contradictions play a central role in activity systems as "sources of change and development." Contradictions are "historically accumulating structural tensions within and between activity systems" (Engeström, 2001, p. 137). Contradictions can serve as sources of innovation and change.
5. Expansive transformations are possible when "the contradictions of an activity system are aggravated [and] some individual participants begin to question and deviate from its established norms" (Engeström, 2001, p. 137). When individual efforts to effect change become a collective change effort and the object and the motive of the activity are reconceptualized to allow for a greater range of possibilities, expansive learning occurs.

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<sup>3</sup> My uses of the terms *context* and *ecology* and their variants suggest their interchangeability, so I want to clarify my interpretation of *context*. I am aware that context is conceptualized in different ways, such as Bronfenbrenner's (1994) concentric circles. While useful in turning attention to proximal surroundings, Bronfenbrenner's approach suggests that context is static rather than dynamic and fails to account for the mutual constitution of human activity (e.g., Cole, 1996; Gutiérrez, 2016). Cole (1996) notes that the concentric circles model proposes a view of context as "that which surrounds" and encourages seeing an act/event "in the middle" of and shaped by contextual layers with clear-cut boundaries. He suggests that returning to the Latin root of the term *contexere* ("to weave together") helps avoid these pitfalls by encouraging a perspective of "the connected whole that gives coherence to its parts." I align with this ecological approach to context, which weaves individual human actions "in concert with and as a part of the permeable, changing, events of life" (Cole, 1996, pp. 136-137). A Vygotskian perspective leads us "to understand human behavior in the contexts of our full ecologies, because activity systems all exist interdependently as ever changing, fluid practices, which are grounded in a larger history" (Gutiérrez et al., 2017).

As these principles delineate, CHAT draws attention to historical and ecological relationships that influence mediated activity with cultural tools (Cole, 1996; Cole & Engeström, 2007; Engeström, 1999; Gutiérrez, 2016). Engeström's (1987) expansion of Vygotsky's (1978) original notion of mediation as individual action is particularly useful for understanding mediated activity in dynamic, fluid, and collaborative classroom settings. His formulation of contexts as activity systems accounts for the subject-mediator-object relationship noted in Figure 1.1, but he elaborated on Vygotsky's and Leont'ev's (1981) approaches to activity by proposing that the action of the individual exists only in relation to the components along the bottom of the expanded mediational triangle: community (the people whose knowledge, interests, stakes, and goals shape the activity—the participants), rules (the shared conventions, customs, and agreements that people adhere to while engaging in the activity), and division of labor (the distribution of tasks and knowledge across the system) (Figure 1.2). In other words, an activity system consists of people, mediating tools/artifacts, an object (motive), sociocultural norms, and roles.

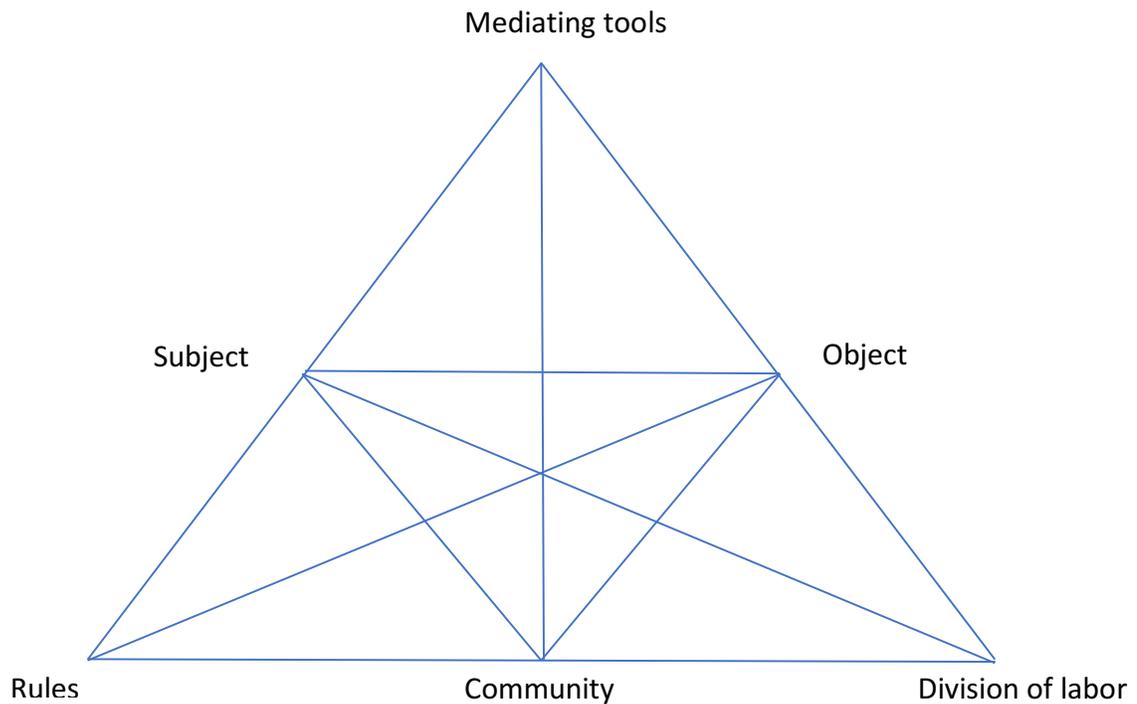


Figure 1.2: Engeström's (1987) model of an activity system.

Following this tradition of activity theory, I approach digital talk as a tool whose uses are informed by particular sociocultural contexts, the motives and histories of individuals involved in those contexts, and the larger sociohistoric and cultural conditions of which the individuals are a part. Practices around digital talk as a learning tool are shaped by the community members who engage in digital talk practices (and who bring with them their own histories as learners), rules

(i.e., shared conventions of a group engaging in digital talk), and division of talk-related labor (i.e., the distribution of tasks and knowledge needed to participate in digital talk across an activity system). Digital talk also is mediated by symbols (e.g., language, emojis) and other tools (e.g., curricular materials).

Additionally, as third generation activity theory focuses on the relationship between at least two activity systems and their goals or motives, this lens can reveal the possible interactions between digital and face-to-face activity systems in classroom ecologies and the potential tensions within and across those two systems. According to Engeström (1999), there are four sources of tension, or four levels of contradictions, that are inherent to any activity system:

1. Within elements of activities (e.g., shortcomings of tools used)
2. Between elements of activities (e.g., issues of usability between the user [subject] and the tool)
3. Between an activity at one point in time and a more advanced form of that activity (e.g., if new tools automate operations of an activity that makes people unnecessary, like driverless cars)
4. Between different activities (e.g., misunderstandings between the teacher's teaching and the student's learning)

The persistent, well documented struggles associated with digital tool use in school settings points to tensions between digital and face-to-face activity systems (e.g., Cuban, Kirkpatrick, & Peck, 2001; Gee, 2017). In particular, digital tools that are designed and marketed to support multimodal communication and collaboration (e.g., tools with social media features) can clash with the established norms, rules, and labor divisions in schools.

I combine sociocultural theories of learning with Bakhtin's (1981, 1986) theories of dialogism to deepen my understanding of the kinds of learning opportunities mediated through digital talk. Bakhtin's theories, which grew out of his study of the novel, a textual form he viewed as multivoiced and intertextual, complement sociocultural approaches by providing specificity about how we develop our ideas systems (ideologies) and who we are through the languages that populate the social world. According to Bakhtin (1981), dialogue is central to both oral and written language and always involves a speaker/writer who shapes language in response to and in anticipation of others (a characteristic he termed "addressivity"). He argued that any signifying practice involves a two-way engagement with a social world that is a link in a larger chain of communication. For example, a student engaging in digital talk likely considers her classmates' or her teacher' previous utterances as well as their anticipated responses to the ideas she is planning to share.

Another key dialogic concept is heteroglossia, which describes the ways in which we draw on and struggle with the language of others as we develop our ideologies. Bakhtin (1981) wrote that language is at once populated with one's authorial intent and the words and authorial intent of others; thus, language is always a hybrid of "another's speech in another's language, serving to express authorial intentions but in a refracted way" (p. 324). Further, that process of hybridizing and integrating others' language is rife with power dynamics. Bakhtin noted that authoritative discourse and internally persuasive discourse are in constant conflict as we encounter the myriad voices in our social worlds. Authoritative discourse is privileged "official" language that is "organically connected with a past that is felt to be hierarchically higher. It is ...

the word of the fathers. Its authority was already acknowledged” (Bakhtin, 1981, p. 342). In opposition to authoritative discourse is internally persuasive discourse, conceptualized as imaginative discourse “tightly interwoven with one’s own word” (Bakhtin, 1981, p. 345). Issues of power are central to how these discourses interact and shape learning. For example, a student using digital talk for literary response in his English class might re-voice his teacher’s interpretation of a text rather than share a divergent textual interpretation. The notion of developing ideas by struggling with and integrating other people’s voices, some with more power and authority than others, helps me think about how teachers organize classroom talk in digital and face-to-face settings and what voices are represented as meaning making resources. How we hybridize and otherwise integrate the voices we encounter and struggle is an endeavor well suited to the ethos of remix in our digital age, in which reposting, curating, and sampling are common heteroglossic practices.

### **Literature Review**

The ultimate goal of this study is to better understand the learning and teaching that happens with digital talk in K-12 classrooms. To situate my inquiry, I review research on classroom discussion in face-to-face and digital settings and research on contextual factors that impact how teachers utilize digital communication tools in their classes. I pay particular attention to research pertaining to literacy teachers’ experiences.

### **Dialogic Classroom Talk**

Broadly defined, classroom discussions are collaborative episodes of talking among teachers and students, or among students, for the purpose of supporting student learning, problem-solving, comprehension, or literary appreciation (Murphy, Wilkinson, & Soter, 2011). A substantial literature has identified multiple approaches to conducting intellectually stimulating classroom discussions that serve diverse pedagogical purposes. Most of these approaches fall under the rubric of what many have come to label authentic or dialogic teaching (e.g., Burbules, 1993; Freedman et al., 2005; Gutiérrez, 1995; Lyle, 2008; Murphy et al., 2009; Nystrand, 1997; Reznitskaya et al., 2012).

Theorists and researchers of classroom language have suggested that the true pedagogical value of talk between teachers and students lies in its dialogic organization (e.g., Alexander, 2008; Bakhtin, 1984; Dewey, 1916; Freire, 1970; Nystrand, Wu, Gamoran, Zeiser, & Long, 2003; Wells, 1999). Grounded in sociocognitive and sociocultural theories that recognize language as the driving force behind cognitive development and reasoning as inherently responsive and polyphonic (Bakhtin, 1981, 1984; Vygotsky, 1962, 1978), dialogic approaches provide students with opportunities to “talk to learn” (Britton, 1989). Students in dialogic spaces share their diverse perspectives and respond to, build on, and disagree with other participants’ perspectives. In dialogic classrooms, power relations are flexible and authority over content and knowledge is distributed among group members. The questions that drive dialogic discourse are “fundamentally open ... in terms of allowing a broader degree of uncertainty in what would constitute an adequate answer” (Burbules, 1993, p. 97). Further, teachers engaged in dialogic talk practices provide students with meaningful feedback that helps students negotiate and build new meanings (e.g., Billings & Fitzgerald, 2002; Freedman et al., 2005; Gutiérrez, 1994; Mercer &

Littleton, 2007; Nystrand, 1997; Reznitskaya, 2012). Researchers have identified certain features that characterize dialogic classrooms, particularly in relation to talk about class-assigned texts: authentic teacher questions and uptake (i.e., incorporation of the previous speaker’s words or ideas in subsequent questions; Collins, 1982) of student ideas (Applebee et al., 2003; Nystrand, 2006; Soter et al., 2008); accountability to rigorous thinking and relevant knowledge, as well as to the ideas of other participants (e.g., Michaels, O’Connor, & Resnick, 2008; Wolf, Crosson, & Resnick, 2005); and collaborative reasoning about big questions or dilemmas (e.g., Freedman et al., 2005; Reznitskaya, Anderson, & McNurlen, 2001).

Dialogic talk stands in opposition to monologic talk, which, following Bakhtin’s (1984) example of teacher-pupil discourse, focuses power on the teacher as the sole “knower of truth” and transmitter of knowledge. Although classroom discourse can never be truly monologic, instruction that is organized as though it were gives the teacher interpretive authority and control of talk through a discourse structure commonly referred to as “preferred responses” (Greenleaf & Freedman, 1993) or IRE (Initiation/Response/ Evaluation; Mehan, 1979) or IRF (Initiation/Response/Feedback; Sinclair & Coulthard, 1975; Wells, 1993) patterns. These participant structures are characterized by the teacher initiating a topic by asking a “known answer question” (Mehan, 1985), the student responding, and the teacher evaluating or giving feedback on the student’s response. Monologic organization of learning is also referred to as recitation (Cazden, 2001; Tharp & Gallimore, 1991) and a “banking” method of instruction (Freire, 1970). To illustrate what these two types of talk might look like in the classroom, Table 1.1 compares conversations from two elementary school classrooms as students discuss the same story (Reznitskaya et al., 2009).

Table 1.1: Monologic and dialogic discussions of the same elementary school class text.

Monologic	Dialogic
<p>Teacher [T]: I want to know who’s the main character in this story.</p> <p>Students: [Raise hand]</p> <p>T: Shelby.</p> <p>S: The goose, Amy’s goose.</p> <p>T: Ok, Amy’s goose. And, one more, Brianna? [Writes on the blackboard]</p> <p>B: Amy.</p> <p>T: Ok, Amy. [Writes on blackboard]. What is the characteristics that you, think, or [student raises hand] qualities, that you think that Amy has, and tell me why you think [two students raise hands]</p>	<p>T: Ok. The big question for today is: Should Amy keep the goose? You may start.</p> <p>J: Um, I think Amy should keep the goose, ‘cause the goose has to be with her, or else it will be dead again.</p> <p>M: I think Amy should let out the goose, because it um ... deserve, it deserves to be free. And um //</p> <p>J: // Yeah, but it might (1) get bit by – it might die, because the fox might eat it (1)</p> <p>A: (1) [to Jeff about Mike] Let him finish ... You have to let him finish (1).</p> <p>M: Yeah but that’s um – but that’s just part of nature. Everything dies. People go outside</p>

<p>she has those qualities ... Ok? Kobe?</p> <p>K: She cares about the environment because she's taking care of the goose.</p> <p>T: Ok, so she's caring. [Writes on blackboard] Good. Another one, Anthony.</p> <p>A: She doesn't try to kill the fox 'cause it, uh, tried to kill the goose.</p> <p>T: Ok, so does that go with caring?</p> <p>A: Yeah.</p> <p>T: Ok.</p>	<p>and squish bugs. And the fox comes out and eats a goose.</p> <p>A: I agree with that and I don't think she should keep the goose because I think a goose should be able to be free, fly around, go to lakes. Um, find its own food. And if it dies, it dies. It's just the way of life.</p> <p>J: I agree with Amber.</p> <p>M: I wouldn't. It wouldn't have a good life locked up, because it wouldn't have much places to fly. And then, if she decides to let him out the next summer, it would be fat, because it wouldn't be able to fly. It wouldn't be able to stretch its muscles. It would be locked up in place.</p>
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*Note: (l) marks overlapping segments*

Research in K-12 classrooms robustly correlates dialogic teaching and enhanced student learning. In one large scale study of classroom talk in hundreds of eighth and ninth-grade English language arts classes across the country, Nystrand and Gamoran (1991) found strong effects on student learning for the overall dialogic quality of classroom talk, measured by proportion of authentic (i.e., open-ended) questions; proportion of uptake (e.g., follow-up questions); and time devoted to discussion (defined by Nystrand and Gamoran as an open exchange of ideas among at least three participants lasting longer than 30 seconds) (Nystrand, 1997; Nystrand & Gamoran, 1991). Students in dialogic classrooms were found to recall readings better, understand them in more depth, and respond to aesthetic elements of texts more fully than those students in more typical, monologically organized classes. These results were largely replicated in a subsequent study by Applebee, Langer, Nystrand, and Gamoran (2003) of 974 students in 64 middle- and high school English classrooms in 19 schools in five states. Using hierarchical linear modeling and controlling for fall performance and a variety of background variables, the study found that discussion-based instruction significantly enhanced literature achievement and reading comprehension.

Researchers of classroom discourse have also highlighted the important role dialogic talk can play in promoting equitable learning opportunities for all students (Boyd & Rubin, 2002; Freedman et al., 2005; Pacheco, 2010; Paugh, 2015). For example, in a study of English-language learners (ELLs) participating in small groups, Pacheco (2010) found that ELLs benefited from discursive spaces where they learned to draw on cultural knowledge and resources, challenge teacher's and peers' contributions, develop background knowledge to engage with texts, and contribute to joint semiotic processes based on "musings and positions" (p. 313). Paugh (2015) similarly found in her study of extended discussions in an urban elementary classroom that the teacher's inclusion of students' various academic, social, and

personal resources in discussion created a classroom microculture that supported students' persistence in seeking meaning with each other. By making space for students' funds of knowledge and ways with words, the teacher created a learning ecology conducive to "dialogic spells," or highly productive classroom discussion where the teacher's voice is "one of many" (Nystrand et al., 2003, p. 6).

Although speech often is considered the central mode of dialogic teaching and learning, some research encourages a more expansive view that considers speech as one communicative mode among many in a dialogic learning ecology. An overall dialogic classroom ecology has been found to benefit even those students who do not participate orally in classroom interactions (Boyd & Markarian, 2015; Freedman & Delp, 2007; Kelly, 2007). In examining whole-class learning in teacher Verda Delp's untracked eighth grade language arts class, Freedman and Delp (Freedman et al., 2005; Freedman & Delp, 2007) noted that the concept of dialogism "reminds us to consider the positive power of many voices coming together, showing us their different histories, perspectives, and points of view," and the many ways in which learning can be organized to support how those voices come together (Freedman & Delp, 2007, p. 260). Rather than focusing on speech-centered activities, Delp designed a learning ecology that invited students to participate across multimodal whole-class sharing opportunities, which included spoken language, written language, and images. Within the larger social matrix of the classroom, students were presented with different ways to individually share and negotiate their perspectives, which in turn contributed to the development of a "grand dialogic zone" for learning. Freedman and Delp's study highlights a need for research that pays close attention to how ecological design intersects with dialogic learning.

**Challenges of implementing dialogic classroom talk.** The case for talking to learn stands on strong theoretical and empirical ground, yet dialogic talk remains rare in classrooms. Commeyras and DeGroff (1998) surveyed the pedagogical practices of a random sample of 1,519 K-12 literacy teachers and related professionals in the U.S. and reported that only 33% of the respondents said they frequently or very frequently had students discuss literature in their classrooms. In an observational study of 64 middle school and high school English classrooms in five states (Applebee et al., 2003), researchers found that the average amount of time spent on dialogic discussions was only 1.7 minutes per 60 minutes of class. In contrast, reports suggest that IRE patterns remain pervasive in elementary and high school classrooms, particularly in relation to group discussions of assigned class readings (e.g., Almasi, 1995; Nystrand, 1997; Smith, Hardman, Wall, & Mroz, 2004). What prevents consequential classroom talk—dialogic talk—from taking hold in classrooms, despite the abundance of support for its inclusion?

Researchers in various disciplines have suggested that more explicit pedagogical tools and strategies, including specific teacher talk moves, may encourage generative class discussion (e.g., Engle & Conant, 2002; Lampert, 1990; O'Connor & Michaels, 1996). For example, Engle and Conant suggested that science teachers should problematize subject matter; give students authority to address problems; hold students accountable to others and to shared disciplinary norms; and provide students with relevant sources. Building off of Nystrand and Gamoran's (1991; Nystrand, 1997) findings, Juzwik and her colleagues (2013) compiled a "dialogic toolkit" for English language arts teachers, including lesson plan suggestions featuring teacher-led tools (e.g., teacher-scripted questions) and student-led tools (e.g., fishbowl discussions).

Still other researchers have argued for the need to look beyond characteristics such as talk time length, discursive moves, and question types and instead focus on teacher education that

supports dialogic stance (Boyd & Markarian, 2015; Caughlan, Juzwik, Borsheim-Black, Kelly, & Fine, 2013; Reisman, 2015; Reznitskaya, 2012). Reznitskaya (2012) and others (e.g., Adler, Rougle, Kaiser, & Caughlan, 2003) have argued that a reason for the continued prevalence of monologic classroom instruction is a lack of professional development that enables teachers to make informed decisions about the use of discussion practices. With the range of available approaches to classroom discussion, preservice and in-service teachers need in depth understandings of the affordances of classroom talk and approaches to talk that are suited to their purposes, their students, their disciplines, and the contexts in which they work (Murphy et al., 2009). In order to bring about changes in classroom discourse, teachers need time to reexamine their own interactions with students, try out and evaluate new behaviors, discover discrepancies between their intended goals and actual practices, and continually question their understandings of effective pedagogy (Garet, Porter, Desimone, Birman, & Yoon, 2001). Despite these calls for increased attention to classroom talk and teacher education, there is yet little research pertaining to professional development that helps pre- or in-service teachers develop dialogic stances (see Juzwik, Sherry, Caughlan, Heintz, & Borsheim-Black, 2012), and there are no studies that consider teacher education as it relates to the expansion of classroom talk into digital contexts.

### **Classroom Talk in Digital Settings**

Research on traditional (face-to-face) classroom discourse suggests that effective talk is dialogic, providing learners with opportunities to explore ideas, improvise, confront notions conflicting with their own, and integrate new perspectives. Researchers of digital tools in classrooms have devoted considerable efforts to studying best ways for new technologies to augment classroom activities, often by attempting to make these activities more collaborative, and digital talk as a form of potentially generative discourse has emerged as another area of study. Literacy scholars have suggested that digitally mediated discussions may have advantages over face-to-face interactions in that they can offer more time for participants to form and edit ideas and responses (Daiute, 2000), encourage the kind of reflection that promotes higher level thinking skills such as analysis, synthesis, and evaluation (Newman, Johnson, Webb, & Cochrane, 1997), and promote a more egalitarian mode of dialogue among peers (Hull & Stornaiuolo, 2014).

One of the earliest expressions of interest in digital talk was CSILE, the “Computer Supported Intentional Learning Environment” (Scardamalia, Bereiter, Mclean, Swallow, & Woodruff, 1989), later developed as “Knowledge Forum” (Scardamalia & Bereiter, 2003). This software, a collaborative tool for making sophisticated hyperlinked notes, was designed to facilitate collective “knowledge building.” Zhang and colleagues’ (2007) study examined Knowledge Forum in an elementary science classroom setting, finding that students using the platform raised and then tackled “authentic problems” and in fact took “collective responsibility” for their mutual understanding of scientific material. Zhang et al. (2009) looked at how Knowledge Forum was used in three different classroom frameworks, each with increasing levels of student freedom (and decreasing levels of top-down organization): “fixed groups,” “interacting groups,” and “opportunistic collaboration.” They found that the third model “led to more pervasive, flexible, distributed collaborations, and greater diffusion of information and knowledge advances, with each student engaged in multiple inquiry threads to help advance the knowledge of the whole community” (p. 34). Their finding suggests that “open participatory

learning,” with its emphasis on authentic engagement, inquiry, and collaborative knowledge building through written interaction, can be translated to the classroom space.

Knowledge Forum represents one “custom made” platform for online collaboration, designed specifically for use in institutional settings such as schools. Researchers interested in digital classroom practice have also explored collaborative and networked writing more generally, especially the use of wikis and blogs. In their meta-analysis of over 200 education-related wikis, Reich, Murnane, and Willett (2012) found a great diversity of wiki uses, not all of which are always collaborative. In fact, only a small percentage of the sampled wikis contained evidence of substantial student collaboration. In a smaller study, Forte and Bruckman (2006) found that the collaborative nature of wikis was at odds with the social organization of classrooms in which students and teachers both operate according to the assumption that individuals--rather than groups--will be evaluated. These studies point to some of the tensions related to the adoption of digital tools with collaborative affordances in school settings, which often have very different and well established rules and norms related to tool use and learning.

Studies on interaction patterns in post-secondary online spaces also suggest that “old” interactional norms can take root without deliberate and active engagement from the instructor. Without intentional design on the part of the instructor, digital discussion takes on characteristics of IRE discourse patterns that do not support the pedagogical goals of authentic classroom discussion (e.g., Hsieh & Tsai, 2012). This research suggests that digital discussion can support active and consequential learning but requires careful attention to how instruction is organized (e.g., Bradley, Thom, Hayes, & Hay, 2008). In particular, the types of question posed and an active teacher presence online are associated with digital talk that is interactive and reflective in ways that provide some of the powerful learning benefits of face-to-face classroom discussion (Garrison & Cleveland-Innes, 2005). As the research for these studies relate to settings outside of K-12, the transferability of the findings may be marginal. However, these findings do raise some considerations that can act as potential reference points when thinking of pedagogy and digital talk in K-12 classrooms.

Digital talk is still developing as an area of educational research, particularly with regard to K-12 learning and teaching. As noted in a Department of Education meta-analysis of classroom studies, there is little research on digital discussion in K-12 contexts (Means, Toyama, Murphy, Bakia, & Jones, 2010), and even less that accounts for the function, nature, and organization of these discussions or how they are mediated by pedagogy and classroom ecologies. Additionally, there are no large-scale data that broadly characterize how teachers at different grade levels use interactive discussions tools that support digital talk about fiction and nonfiction texts. Studies of social studies (Hess, 2009) and language arts classes (Applebee et al., 2003; Nystrand, 1997) have reported that high-socioeconomic status (SES) students are more likely to encounter dialogically organized instruction than low-SES students, but these findings come from face-to-face classroom discussion contexts. Further, little is known about how K-12 teachers perceive the affordances and constraints of these tools for learning and teaching. As schools continue to adopt tools with digital talk capabilities and communicating via digital talk becomes an increasingly vital life skill, comprehensive data on how teachers use digital talk technologies can help practitioners and researchers consider how we might reorganize learning to support consequential dialogue in expanded discursive settings.

This work is urgently needed, as large-scale examinations of digital communication tools in K-12 classrooms suggest that even regular access to digital communication tools cannot

guarantee the kinds of social interactions that support consequential learning (Hutchison & Reinking, 2011; Reich et al., 2012). In an earlier study of Subtext use in three elementary and middle schools, my colleagues and I found that the assumptions teachers brought to digital communication tools often shaped how they implemented digital talk with their students (Higgs, Miller, & Pearson, 2013). For example, one assumption shared by the teachers was the idea that digital talk functioned in the same way as face-to-face talk. Accordingly, teachers posed the kinds of open-ended questions in the Subtext e-reader that they used to stimulate lively face-to-face classroom discussions about literary texts. Once they posed the questions in Subtext, the teachers would “step back” and ask the students to respond to the question via digital talk. We found that the resultant digital discourse patterns that emerged from this approach closely resembled recitation patterns, with students directly responding to the teacher’s question rather than to contributions from other discussants. These findings underscore the importance of examining the factors that influence the organization of digital and face-to-face talk opportunities in everyday classroom life, and if and how those discursive opportunities interact.

### **Ecological Factors that Influence Digital Tool Use in Classrooms**

The apparent gap between the amount of available technology in schools and teachers’ uses of that technology for instruction (e.g., Cuban, 2001; Cuban et al., 2001; Gray, Thomas, & Lewis, 2010; Hutchison & Reinking, 2011) has motivated researchers to uncover potential factors that can shape classroom technology use. These factors have been thoroughly reviewed (e.g., Ertmer & Ottenbreit-Leftwich, 2010; Kopcha, 2011) and include teachers’ beliefs and attitudes (e.g., Ertmer, 2005; Lim & Chai, 2008), demographic characteristics of teachers (e.g., Russell, Bebell, O’Dwyer, & O’Connor, 2003), availability and access to computers and resources (e.g., Hohlfeld, Ritzhaupt, Barron, & Kemker, 2008), and school support structure (e.g., Davis, Preston, & Sahin, 2009).

As some researchers have observed, studies of factors that influence classroom technology use have left contextual factors unexamined (Hew & Brush, 2007; Tondeur et al., 2012) or have treated contextual factors (e.g., access to technology, support availability, and staff development exercises) as independent variables whose effects contribute to the behavior of individuals rather than factors that are situated in specific settings and which impact how teachers learn how to use technology in and across settings and among groups (Somekh, 2008; Windschitl & Sahl, 2002). Focusing on characteristics that inhere to individuals may not account for the underlying processes that shape and are shaped by participation in multiple professional communities. Teachers, as Somekh (2008) points out, are not entirely “free agents” when it comes to technology, and “their use of ICTs for teaching and learning depends on the interlocking cultural, social, and organizational contexts in which they live and work” (p. 450).

Although many studies have treated teacher beliefs as a crucial factor in technology integration (e.g., Ertmer, 2005; Funkhouser & Mouza, 2013; Prestidge, 2012), research also suggests that teachers’ classroom uses of technology are not necessarily consistent with their reported beliefs and that teachers can hold conflicting educational beliefs about how to integrate technology into instruction (e.g., Chen, 2008; Levin & Wadmany, 2006). Ertmer (2005) suggested that contextual factors might cause inconsistency between expressed technology-related pedagogical beliefs and implemented technology-related practices. Contextual factors that may influence teachers’ technology integration include policy, institutional culture, and

availability of appropriate equipment, training, and integration examples (e.g., Cuban et al., 2001; Norris et al., 2003). Studies indicate that contextual factors such as these play a crucial role in teachers' technology integration decisions and practices (e.g., Davis et al., 2009; Inan & Lowther, 2010; Zhao & Frank, 2003)

Institutional (school) culture in particular can contribute to the ways in which teachers implement or fail to implement technology. The pressure to conform to the norms, values, and shared beliefs among individuals is often significant in schools (Roehrig, Kruse, & Kern, 2007; Somekh, 2008), and this cultural pressure makes it unsurprising that "teachers are reluctant to adopt a technology that seems incompatible with the norms of a subject culture" (Hennessy, Ruthven, & Brindley, 2005, p. 161). Zhao and Frank (2003) noted that a technological innovation was less likely to be adopted if it deviated too much from the existing values, beliefs, and practices embedded in a school's ecology, while changes in beliefs about technology use were more likely among teachers who were socialized by their colleagues to think differently about ICT use.

Times, access to technology, and teachers' perceptions of these factors have also been found to impact classroom technology integration. Teachers have reported being reluctant to use technology because they feel they are "throwing away" time on planning and preparation (Al-Senaidi, Lin, & Poirot, 2009; Kopcha, 2012), or on disciplining students for inappropriate behavior while using technology (Bauer & Kenton, 2005; Wachira & Keengwe, 2010). Access also continues to be identified by teachers as a significant factor in their decisions to integrate technology, despite reports of instructional computer ubiquity in U.S. schools (National Center for Educational Statistics, 2008). Studies have shown that teachers feel they lack technology even when it is available because the working condition of the equipment is not reliable (e.g., Lim & Khine, 2006; Zhao, Pugh, Sheldon, & Byers, 2002).

The professional education opportunities and technical supports that teachers have can also impact technology use. When technology training lacks connection to classroom practices and needs (e.g., stand-alone workshops), or when it focuses solely on technical skills rather than the learning experiences supported, it can inhibit classroom technology integration. The literature also suggests that technology integration is influenced by the support that comes from peers, administration, and the community (e.g., Inan & Lowther, 2010; Mumtaz, 2005). Lack of professional development related to digital technology is an issue identified by literacy teachers as well (Hutchison & Reinking, 2011), with practitioners citing a lack of ongoing professional development sensitive to disciplinary and contextual needs (cf. Mahiri, 2011).

Contextual factors in schools and classrooms can significantly affect the process by which teachers' beliefs and knowledge change (Richardson, 1996), and these factors combined can affect classroom technology use. To manage the complexity of teaching, teachers may develop different coping strategies, which may be inconsistent with the teachers' own beliefs (Konopak, Davis, & Readence, 1994). Tabachnick and Zeichner (2003) suggested that the alignment of teacher beliefs and of teacher practices is a consequence of an ongoing negotiation process by which a teacher resolves conflict between organizational supports and organizational constraints. Thus, teachers do not base their decisions related to technology implementation solely on their pedagogical beliefs. As Ertmer and Ottenbreit-Leftwich have argued (2010), knowledge, beliefs, and context intersect in complex ways when it comes to technology integration. In order to understand teachers' technology practices—and how we might influence instructional change in service of transformative, student-centered teaching—it is necessary to

consider all these factors. Zhao, Pugh, Sheldon, and Byers (2002) lamented that, despite a preponderance of survey studies examining factors influencing teachers' uses of technology, "these types of studies tend to neglect the messy process through which teachers struggle to negotiate a foreign and potentially disruptive innovation into their familiar environment" (p. 483). In other words, surveys can fail to capture the rich details of teachers' uses of instructional technology and the complex negotiation of teachers' beliefs and contextual discourses.

Taken as a whole, studies of contextual factors that impact teachers' uses of digital technology suggests that a wider range of research methods are needed in order to provide more nuanced representations of teachers' practice with tools. Additionally, researchers must consider not just what teachers "do" with digital tools, but also what teachers do in the context of specific departments, schools, and districts, as members of various communities, and as individuals with distinct pedagogical beliefs. Adopting a lens, such as CHAT, that accounts for varying contextual factors can reveal what teachers may struggle with as they attempt to integrate digital talk and what supports they might need to successfully negotiate what Zhao et al. (2002) refer to as "that messy process."

### **Research Needs and Research Questions**

Although digital talk is becoming more common in school settings nationwide, review of the literature revealed a lack of empirical work that examines the function and form of digital talk in K-12 classrooms and implementation of digital talk that supports consequential learning. Further, studies of pedagogical uses of digital tools rarely consider the social and cultural contexts that mediate tool use or the processes by which teachers learn to integrate digital tools into their classrooms.

This study aims to shed light not only on discourse features of digital talk in elementary and high school classrooms but also the social and cultural contexts that mediate it and the connections and disconnections between online and offline practices that influence the interactional accomplishment of meaning. It further aims to examine relationships between types of talk and types of learning. Using these methodological approaches and data, I address the following questions:

1. How do Subtext teacher-users (n = 451) understand their uses, perceptions, and evaluations of Subtext, a tool designed to support digital talk? What does the survey tell us about digital talk in K-12 classrooms nationwide?
2. What kinds of learning opportunities are mediated by digital talk in an elementary school classroom? What is involved in designing learning that is organized to support dialogic digital talk?
3. What kinds of learning opportunities are mediated by digital talk in a high school English classroom? What is involved in designing learning that is organized to support dialogic digital talk?

## CHAPTER 2: METHODS

Tools that support digital talk, such as online discussion threads and social media sites, are part of everyday life in many classrooms in the United States. However, research that provides a window into how teachers use these tools with their students is relatively limited. I used mixed methods to investigate the learning and teaching that happens with digital talk in K-12 classrooms. Mixed methods research legitimates multiple approaches in answering research questions and invites “the collection of multiple data using different strategies, approaches, and methods in such a way that the resulting mixture or combination is likely to result in complementary strengths and non-overlapping weaknesses” (Johnson & Onwuegbuzie, 2004, p. 18). Survey and design-based research methodologies contributed data that, combined, enabled me to understand broad trends in digital talk form and function across U.S. classrooms as well as “on the ground” student and teacher digital talk practices. The survey data characterize how teachers at different grade levels use interactive discussions tools that support digital talk about fiction and nonfiction texts. Design-based research (DBR) provides a research model that supports the exploration, theory-building, and testing needed to gain understandings of the kinds of pedagogical strategies that teachers need to use digital talk as an effective learning tool in everyday class contexts. Further, because the work of design-based research unfolds in and is attuned to “complex, messy” learning environments such as classrooms and schools (Shavelson, Phillips, Towne, & Feuer, 2003, p. 25), DBR can shine a light on the ecological variables that shape teaching and learning with digital talk.

The first section of this chapter provides a brief overview of the interactive e-reader Subtext, a popular interactive e-reader application designed to support classroom talk around texts. I selected Subtext as a case to explore digital talk. I then provide details about the methods employed to collect and analyze survey data collected from K-12 Subtext teacher-users across the U.S. (n = 451) and the methods used to collect and analyze data for my design-based research collaborations with an elementary school teacher and a high school teacher.

### **Subtext: A Digital Tool for Digital Talk**

I chose Subtext, a popular K-12 e-reader application (app) designed to support classroom talk around e-texts, as a case to explore the form, function, and organization of digital talk for educational purposes. Originally released as an iPad app, Subtext features tools that give users the ability to interact with the text and other readers.<sup>4</sup> Teachers and students download books and articles from the library dashboard and teachers can also upload their own digital texts (e.g., PDFs) (Figure 2.1).<sup>5</sup> Teachers can create reading assignments for the texts, which are accessed

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<sup>4</sup> The start-up company Subtext first released its eponymous e-reader as a general book club app on iTunes in 2011. After learning of its rising popularity among teachers looking for a free e-reader app, the start-up company rebranded itself in 2012 as an educational technology company and the Subtext app as a digital classroom tool for supporting the close reading standards outlined in the Common Core State Standards. In the summer of 2014, a large educational technology company acquired the app and integrated the e-reader into their digital reading instruction program.

<sup>5</sup> Through July 2015, teachers and students could make in-app purchases of books available on Google Play. These books were available to download via the Subtext library dashboard after purchase. As a number of teachers noted in their survey responses (Chapter 3), purchasing books was too costly and

through each text's "About" page, and monitor students' progress through the different assignments by looking at the "Track Progress" chart at the bottom of the "About" page (Figure 2.2).

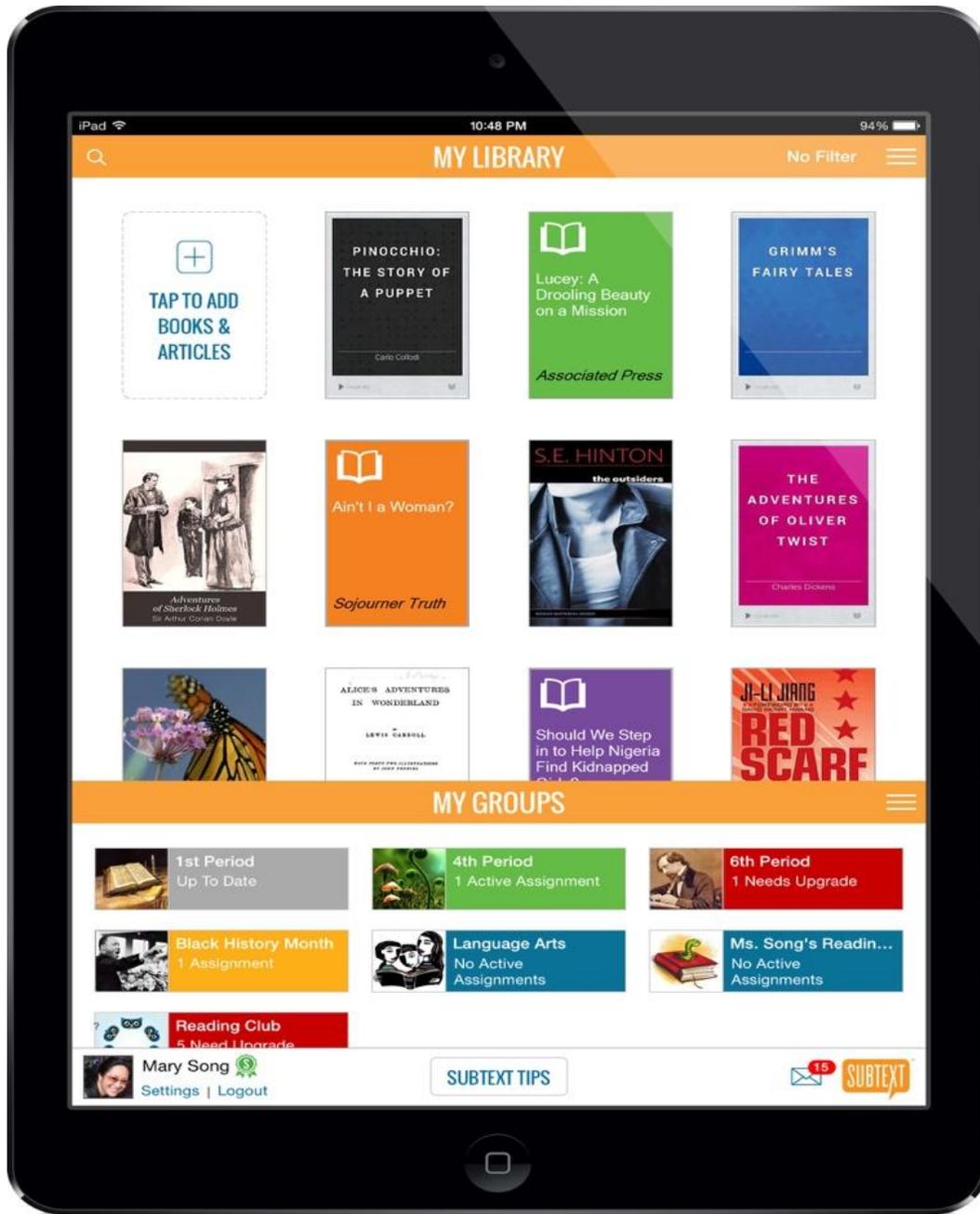


Figure 2.1: Subtext library dashboard, showing available texts and reading groups.

many looked for free digital texts to download as PDFs, which they could then import into Subtext.

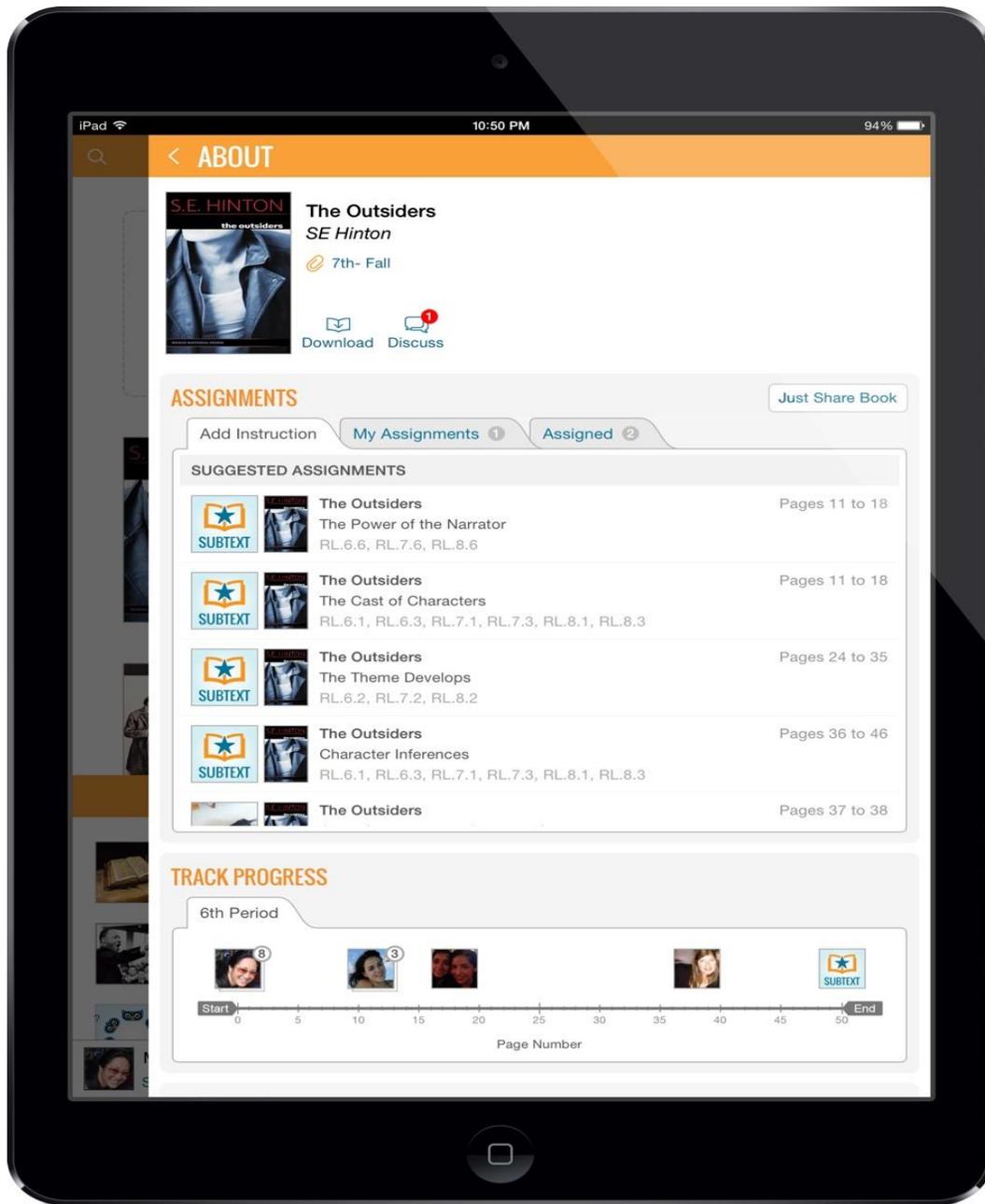


Figure 2.2: Example “About” page with reading assignments and “Track Progress” chart.

After downloading an e-text, readers can highlight text segments, create and apply tags to those segments, post comments, copy text for exportation to a Google Doc, and link to Web content (e.g., images, Wikipedia) through Google. This activity is “published” and appears as digital marginalia in the e-book. Figure 2.3 shows the highlighting tools as well as the user avatars that index readers’ activity (the small numbers in the upper left-hand corner of some of

the avatars indicate responses on a particular discussion thread). Readers can touch an avatar on a page to see other readers' posted comments and/or join the conversation with a comment of their own (Figure 2.4 shows the commenting interface). A discussion thread is always anchored in the segment of text that the original commenter selected (see Figure 2.5 for sample thread), although the ensuing interactions are, of course, dependent upon the participants.

Over 5,600 K-12 teachers across the United States used Subtext during the 2014-2015 school year and numbers continue to grow, making it one of the most widely adopted e-readers used in schools nationwide. This combination of widespread adoption and unscripted support of classroom talk (i.e., the app does not provide specific commenting templates or models to which users must adhere) positioned Subtext as a particularly rich digital talk study "site."

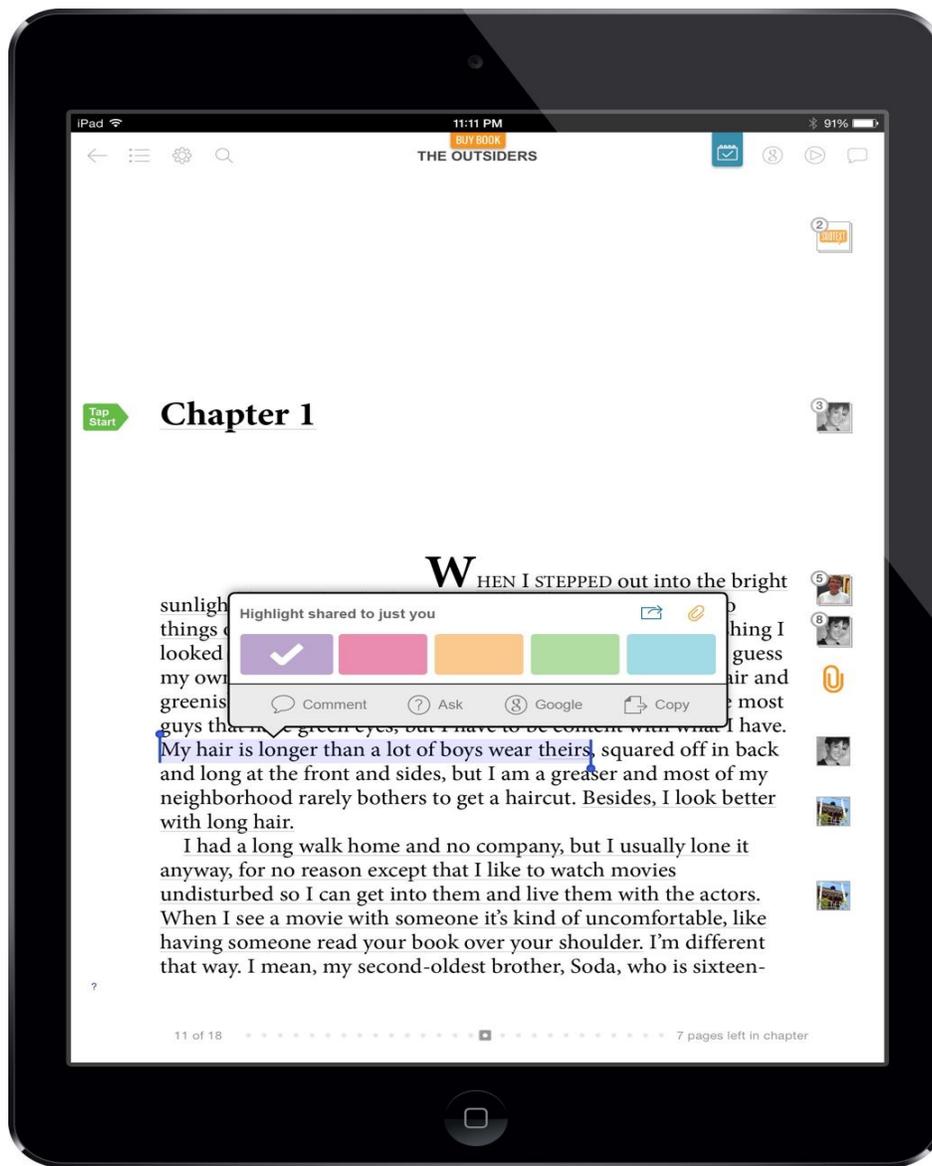


Figure 2.3: Subtext highlighter and commenting tool options.

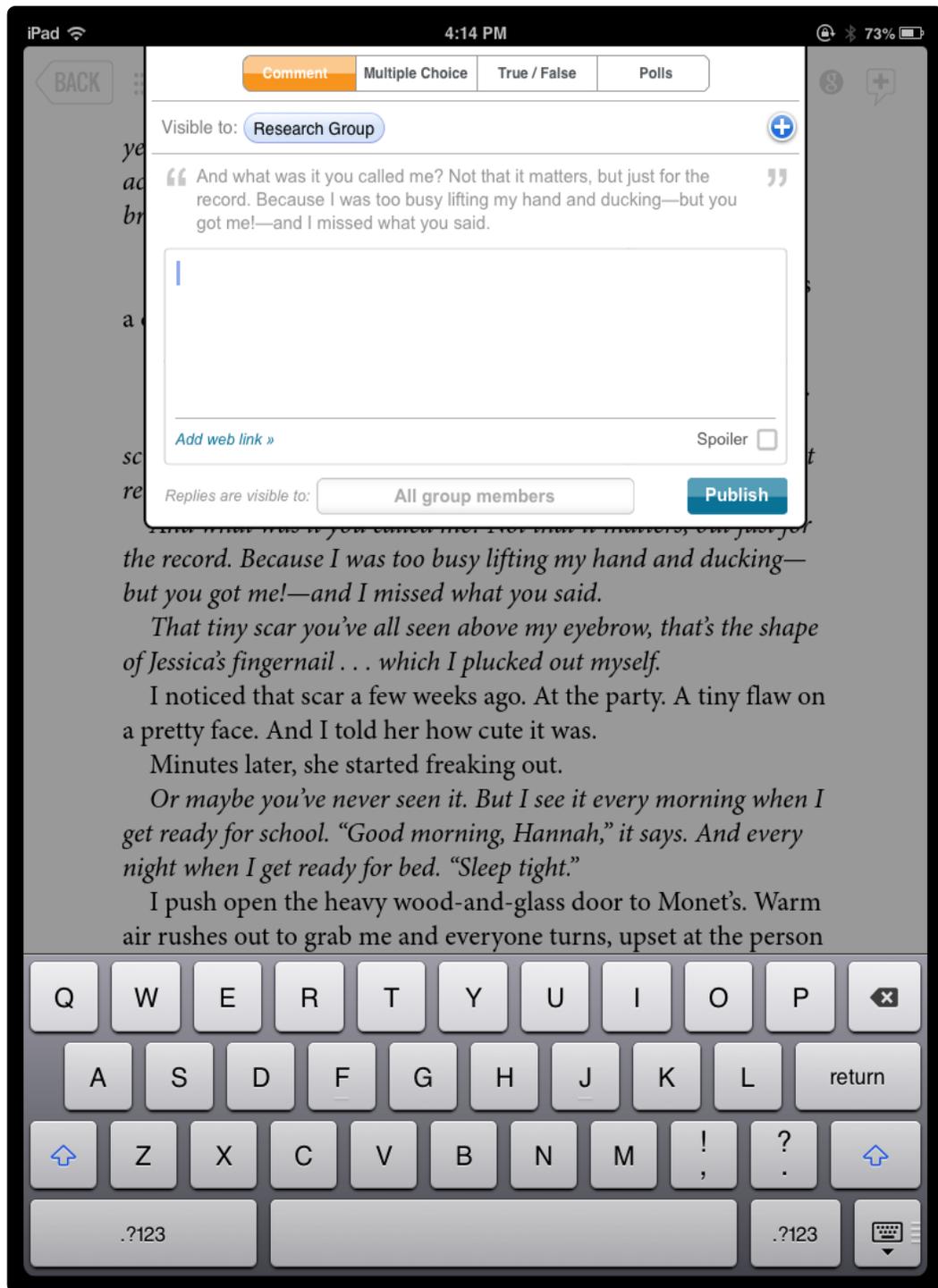


Figure 2.4: Subtext comment user interface. All comments are anchored to a highlighted portion of the text.

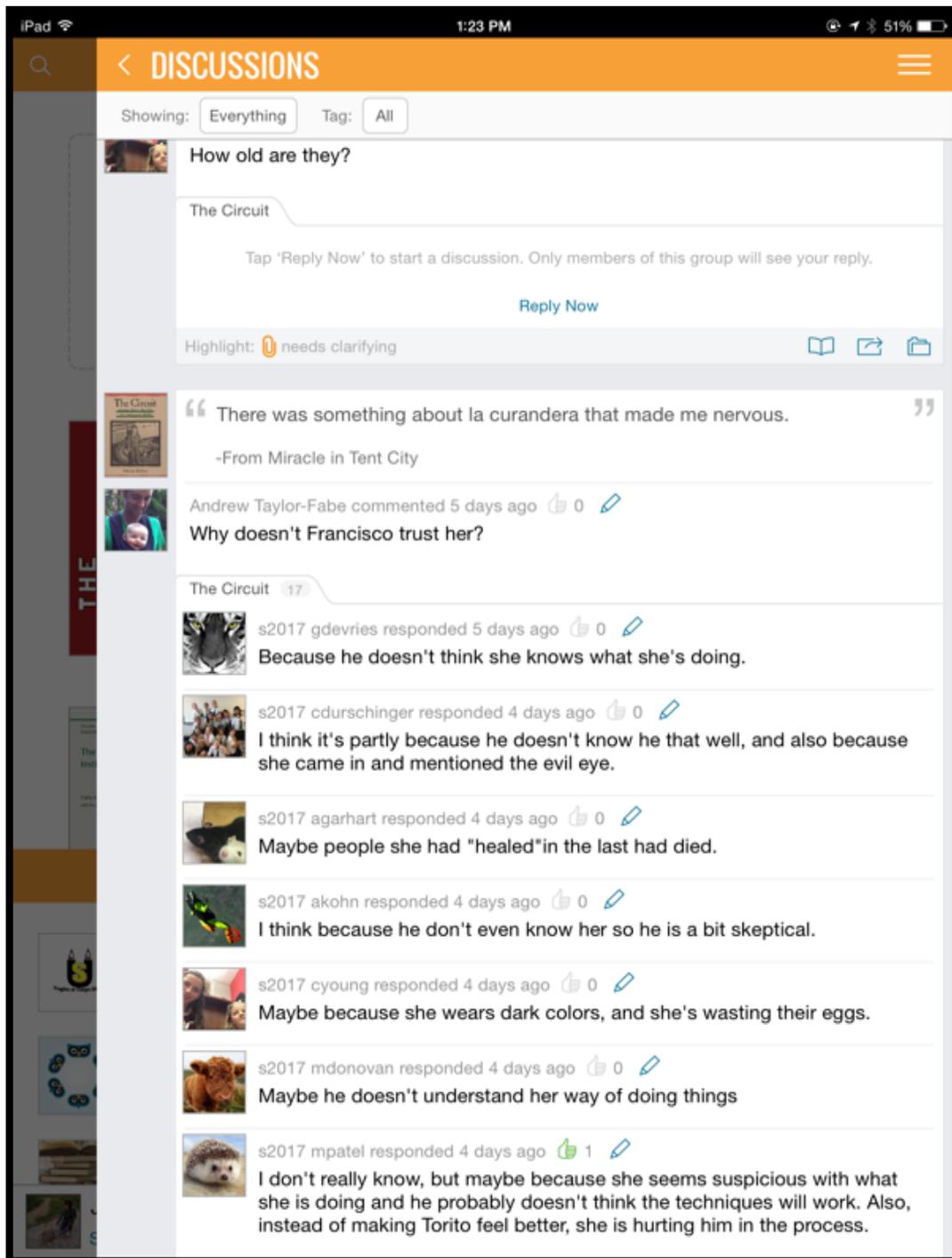


Figure 2.5: Example of a discussion thread in Subtext.

## Methods for Survey

I designed and disseminated an online survey to learn about pedagogical approaches to Subtext among K-12 teachers nationwide in Spring 2015. In particular, I was interested in K-12 teachers' reported uses of a tool that supports digital talk and K-12 teachers' perceptions of affordances and constraints of the Subtext tool. The broad research questions that guided survey design and analysis were: How do Subtext teacher-users (n = 451) understand their uses, perceptions, and evaluations of Subtext, a tool designed to support digital talk? What does the survey tell us about digital talk in K-12 classrooms nationwide?

### Participants

The sample for this survey was drawn from K-12 teachers in the United States who were categorized as active users of Subtext in their classrooms during the 2014-2015 school year (n = 451). I define "active users" as those teachers who used Subtext at least three times a week for at least four weeks at some point during fall 2014 and/or spring 2015. I viewed fulfillment of these criteria as rough indication of consistent use for at least one unit plan. In order to reach the widest possible range of Subtext active teacher users, I contacted the research department at the company behind Subtext and explained to the director of research the purpose of my survey and my participant criteria. The director was interested in collecting similar data and agreed to provide me with a roster of applicable teachers if I agreed to share the collected data with Renaissance. This seemed like a fair exchange and I agreed to share the responses once the survey was closed. Because survey research has suggested that pre-notification of a survey effectively improves response rates (Schaefer & Dillman, 1998; Sheehan, 2001), I also asked the director to send all potential respondents a pre-notification email explaining the purpose of the survey and my university affiliation three days before I sent my survey invitation to the teachers. He agreed to send a brief introduction email to all teacher users three days prior to my initial contact.

As Table 2.1 shows, respondents represented all grade levels from kindergarten through 12<sup>th</sup> grade. K-6 teachers represented 28.8% (n = 223) of survey respondents; middle school teachers (grades 7-8) represented 20.2% (n = 156); and high school teachers represented 51% (n = 394). In addition to grade level designations, I collected demographic information related to teaching experience and experience using Subtext. This information did not factor into the analysis presented here, but I am including it in Table 2.1 to provide an idea of the broad range of professional experiences represented by the participants.

Table 2.1: Profile of teacher survey respondents.

<b>Professional experience</b>	<b># of respondents</b>	<b>% of respondents</b>
<b>Experience teaching with<sup>6</sup> Subtext in grade(s)</b>		
K	2	0.45%
1	5	1.13%
2	6	1.35%
3	29	6.55%
4	48	10.84%
5	56	12.64%
6	77	17.38%
7	78	17.61%
8	77	17.38%
9	105	23.70%
10	93	20.99%
11	104	23.48%
12	92	20.77%
<b>Overall teaching experience (years)</b>		
Less than 1 year	11	2.45%
1-2 years	25	5.57%
3-5 years	76	16.93%
6-10 years	88	19.60%
Over 10 years	239	52.23%
Unspecified	10	2.22%
<b>Length of experience using Subtext with students</b>		
One school semester or less	135	30.34%
Two school semesters	131	29.44%
Three school semesters	63	14.16%
Four school semesters or more <sup>7</sup>	116	26.06%

<sup>6</sup> Teachers' demographic information was provided voluntarily. For this question, teachers selected all grades with which they had experience using Subtext. Therefore, some participants were counted more than once, as the frequencies noted here suggest, although the total sample is 451.

<sup>7</sup> Five and a half semesters would have been the maximum length of use at the time the study was distributed.

## Development and Validation of Survey

The development and validation of the online survey followed procedures and recommendations in the literature on survey development (Rea & Parker, 2005), including the development of online surveys (Sue & Ritter, 2007). The development of the survey began by establishing the constructs that would be surveyed. These constructs (Table 2.2) were derived from the guiding research question (How do Subtext teacher-users who responded to the national survey understand their uses of a tool designed to support digital talk for literacy learning?), as well as the uses of Subtext that I noticed in pre-study observations of Subtext use in five classrooms (two elementary classes, two middle school language arts classes, and one high school English language arts class).

Table 2.2: Survey constructs and survey items.

Survey construct	Representative item(s)	Numbered items from survey <sup>8</sup>	Response format
Teachers' reported reasons for using Subtext	Why are you using Subtext in your classroom for reading? Please choose all responses that apply to you.  Why are you using Subtext for writing? Please choose all responses that apply to you.	1A-G, 2A-G	Checklist (check all that apply), open-ended ("other")
Teachers' reported classroom uses of Subtext	Please choose all the responses that apply to your classroom uses of Subtext.	3A-L	Checklist (check all that apply), open-ended ("other")
Teachers' perceptions of digital talk as a learning tool that encourages student participation.	Subtext allows for students who do not normally participate in whole group discussions to participate.	4	Yes/no, open-ended ("other")
Teachers' perceptions of affordances and constraints associated with using a tool that supports digital talk	In your opinion, how does using Subtext compare with using more conventional tools and approaches?	6	Open-ended

In order to investigate how well the questions might perform when asked of survey respondents (i.e., if respondents understood the question correctly and if they can provide

<sup>8</sup> Please see Appendix A for numbered survey items.

accurate answers), I conducted cognitive labs with a high school English teacher and a middle school language arts teacher. Cognitive testing, which takes the form of a “think aloud,” ensures that a survey question successfully captures the intent of the question and, at the same time, makes sense to respondents. Questions that are misunderstood or that are difficult to answer can be improved prior to survey dissemination, thereby increasing the overall quality of the collected data (Collins, 2003). These two teachers were selected because they were familiar with Subtext and had used it before with students. However, they were not part of the survey sample because they were not using Subtext in their classes at the time of data collection. I created and followed a cognitive lab protocol (Appendix B) designed to examine the respondents’ question-response processes and to uncover any difficulties they experienced as they formulated responses to the questions. Following these cognitive lab sessions, I revised the survey based on the two teachers’ feedback to improve clarity. For example, I added parenthetical examples to clarify some of the offered multiple answer choices. I also added survey items to capture more demographic information. Each teacher was compensated for her time (approximately one hour per session) with a \$50 Amazon gift card.

Once revised, the survey was converted to an online format using Qualtrics, a widely-used survey software for developing and analyzing online surveys. The final survey consisted of a survey overview and consent letter, seven multiple choice items, one yes/no item, and two open-ended items, for a total of 10 survey data collection items. Applicable multiple choice items also provided an “other” option so respondents could offer additional information in a text box. Respondents were informed of their right to decline any questions and to stop taking the survey at any time. Table 2.2 summarizes the major constructs in the final survey, followed by a sample item, the corresponding item numbers on the survey, and the format of responses for each construct. In addition, I added two items at the end of the survey: an item that asked the respondent to note a preferred email address if she/he wanted to opt into a drawing for one of five \$100 Amazon gift cards, and an item that asked respondents to share their contact information if they were interested in participating in a 15-minute phone call about their Subtext experiences in the classroom.<sup>9</sup> I intentionally designed a survey that would take no more than 10-15 minutes as email/online survey research indicates that longer surveys can negatively influence response rates. Given the busy schedules of teachers, I wanted to offer a survey that could be completed at one sitting.

### **Disseminating the Survey and Soliciting Participation**

Survey research has suggested that pre-notification of a survey, multiple contacts and opportunities to complete a survey, and monetary incentives effectively improve response rates (Schaefer & Dillman, 1998; Sheehan, 2001). Accordingly, in addition to the pre-notification email sent from the director of research, I added an incentive in the form of drawings for five \$100 Amazon gift cards.

The company behind Subtext identified 5,679 K-12 teachers who fit my “regular user” criteria. My initial contact was a mass invitation email to all teachers to introduce myself, to inform them of the study, to request their participation, and to inform them of the incentive. The

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<sup>9</sup> Eighty teachers indicated willingness to speak on the phone, and eight phone interviews were conducted. Data from these phone interviews are not reported on in this study.

email also contained the unique survey link for each respondent. A week after sending the original email invitation, I sent a reminder email to teachers who had not submitted their completed surveys. Ten days later, I sent out a final reminder to teachers who had not submitted their completed surveys. The email addresses for the teachers appeared to be accurate, as only four out of the 5,679 emailed invitations bounced. In total, 665 of the surveys were started by respondents, and 552 respondents submitted their surveys (9.7% response rate).<sup>10</sup> Of the 552 submitted surveys, 543 gave consent to participate in the survey and nine opted out. A week after the final reminder email, I closed the survey in Qualtrics and exported the data as a CSV file for analysis. Five respondents were selected randomly in a drawing for the Amazon gift cards and notified after the close of the survey.

## Analysis

Analysis began by deleting analytically superfluous information such as the survey participants' start and end times, IP addresses, duration, and email addresses. Next, surveys that did not provide any data (i.e., respondents who consented, clicked through the questions without providing information, and submitted the survey) or that did not provide data aside from demographic information (i.e., respondents who did not share any information related to Subtext use in the classroom) were deleted. This resulted in 451 valid completed surveys.

Univariate analyses of the survey data were performed to examine distribution frequencies<sup>11</sup> related to participants' demographic information (Q7, Q8, Q9, Q10), respondents' reported reasons for using Subtext in the classroom (Q1, Q2), respondents' reported classroom uses of Subtext (Q3), and teachers' perceptions of digital talk as learning tool that encourages

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<sup>10</sup> The usual response rate for email surveys to the general public is 24%. The 9.7% rate for this survey could introduce non-response bias. There are a few different possible reasons for the low response rate. First, the sample included teachers who had used Subtext during the 2014-2015 school year, even if they only used it a month and stopped entirely. It is feasible that teachers who used it for a short period of time decided not to participate because they were no longer using the app when the survey invitation arrived. Reasons that led to teachers not using the app could have also contributed to decisions to not participate in the survey. Additionally, teachers are a difficult group to recruit due to their busy schedules. I tried to design the survey so that it would take under 10 minutes and be accessible on mobile device screens so teachers had more flexibility, but is it possible that the timing of the survey during one of the busiest times of the school year (late spring) prevented some teachers from participating and/or completing the survey.

<sup>11</sup> I used the check-all-that-apply (CATA) question format for Q1, Q2, Q3 in order to gain a broad understanding of the range of teachers' reasons for adopting Subtext to support reading and writing, and of teachers' uses of Subtext for reading and writing with their students. Like all survey question types, the CATA question format has some disadvantages. CATA precludes multivariate analyses (MVA) because the responses cannot be categorized into discrete variables (violating the assumption of independence that is central to MVA). However, CATA struck me as a reasonable question format for this survey due to my general interest in Subtext teacher-users' perceptions and uses of the app and due to my objective of capturing teachers' thoughts/feelings as quickly and accurately as possible. I could have used a forced choice question format, but this format can encourage participants to respond in a way that does not truly reflect what they think, which can contribute to measurement errors, nonresponse errors, or early termination.

more student participation (Q4).<sup>12</sup> Responses provided as “other” for questions 1, 2, 3, and 4 were hand coded. For the comparative analyses of elementary, middle, and high school teachers, I built tables that provided within-row comparisons of K-6, 7-8, and 9-12 teachers’ responses to each selection for questions 1, 2, 3, and 4 (i.e., to compare elementary school teachers with elementary school teachers, middle school teachers with middle school teachers, and high school teachers with high school teachers).

For the open-ended item Question 6 (“In your opinion, how does using Subtext compare with using more conventional curricular tools and approaches?”), I exported responses as a Word document to code with the computer-assisted qualitative data analysis (CAQDA) software ATLAS.ti. To analyze the 401 open-ended responses, I devised descriptive codes (Miles & Huberman, 1994) to summarize the topics and ideas in teachers’ responses and to identify the sentiment(s) teachers associated with those ideas and topics. I used a simultaneous coding technique (the application of two or more codes within a single datum; Saldaña, 2009) during this round of coding to capture the nuances in teachers’ responses. I then re-coded teachers’ responses for sentiment (feelings) (Goleman, 1995). Tracking teachers’ sentiments about Subtext use in their classrooms and the benefits and challenges they identify can suggest their ideological and practical approaches to digital talk, as engagement with tools is embedded in emotion or sentiment that “often reveals underlying ideologies” (Wohlwend & Lewis, 2011, p. 191).

Four sentiment-related categories were identified, “positive sentiment,” “negative sentiment,” “mixed sentiment,” and “uncertain.” The “positive sentiment” code referred to responses that focused on Subtext affordances and/or described Subtext as preferable to conventional curricular tools and approaches. “Negative sentiment” referred to responses that focused on Subtext constraints and/or described Subtext as inferior to conventional curricular tools and approaches. “Mixed sentiment” referred to responses that expressed both positive and negative sentiments about Subtext use, and “uncertain” referred to responses that did not reveal distinct sentiment about Subtext use in the classroom.

Following these first cycle coding methods, I further condensed the data through pattern codes (Miles & Huberman, 1994) that organized how teachers conceptualized affordances and constraints related to Subtext use. These patterns identify themes in how teachers experienced Subtext for teaching and learning: as a Teacher Tool (tool mediating teacher productivity and organization of instruction), Student Tool (tool mediating student-led learning activities), Timely Tool (tool with contemporary value and relevance due to its digital nature), and Unreliable Tool (tool with technical problems that negatively impacts instruction).

Upon completing these coding cycles, I used the Code Co-occurrence function in ATLAS.ti to examine possible relations between sentiment codes and pattern codes. Co-occurrence means that both codes either are applied to the same segment or to overlapping segments (Armborst, 2017). Studying code co-occurrence, or spatial associations between concepts, can reveal something about the context, or activity system (Engeström, 1987, 2001), within which people refer to certain concepts (Contreras, 2011). Because it was impossible for me to get to know the hundreds of activity systems in which the participating teachers and their students interacted, conducting a code co-occurrence analysis offered an opportunity to make conjectures about contexts of learning and the ideologies driving tool use in those contexts. To

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<sup>12</sup> Because teachers could select more than one choice for Q1, Q2, and Q3, I reported frequencies (counts) and percentages relative to the total sample of 451.

construct the table, I displayed sentiment codes (“mixed feelings,” “negative sentiment,” and “positive sentiment”) in the columns and pattern codes (“teacher tool,” “student tool,” “timely tool,” and “unreliable tool”) in the rows. With the Code Co-occurrence tool, if two codes co-occur, the cells of the table show two numbers. The first one is the frequency of co-occurrence, and the second is the c-coefficient, which determines the strength of the relation between two codes, similar to a correlation coefficient in statistics.<sup>13</sup>

### Methods for Design-Based Research Experiments

As a complement to the macro perspectives offered by the nationwide Subtext teacher survey, I conducted research in an elementary classroom and a high school English classroom to explore with teachers how digital talk mediated learning opportunities in those activity systems (which, as noted in Chapter 2, consist of the people, sociocultural rules, and division of labor that shape any goal-directed, tool-mediated human activity) and how activity systems might be organized to support dialogic digital talk. Data from my collaborations with the two teachers address this study’s second and third research questions: What kinds of learning opportunities are mediated by digital talk in an elementary school classroom? What is involved in designing learning that is organized to support dialogic digital talk? What kinds of learning opportunities are mediated by digital talk in a high school English classroom? What is involved in designing learning that is organized to support dialogic digital talk?

To pursue these questions, I participated in two separate design-based research (DBR) collaborations, one with an elementary school teacher and one with a high school English teacher. Collaborating with teachers “on the ground” to gain practical insight about the process of supporting talk in different learning environments was, to me, a necessary complement to the macro perspectives on the form and function of digital talk in K-12 classes nationwide and on pedagogy and everyday classroom uses of digital talk offered through the other study stages. Additionally, this methodology aligns with my commitment as a researcher to collaborating with classroom teachers to address persistent, teacher-identified problems of practice (Horn & Little, 2010).

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<sup>13</sup> The number (401) of responses for survey item #6 was high enough to make looking at the c-coefficient meaningful. Typically, the value of the c-coefficiency is between 0 and 1, with 0 indicating perfect independence and 1 indicating perfect relation. On the ATLAS co-occurrence table, the lighter the color of a cell, the higher the frequency of co-occurrence. When the coefficient is low but the data segments overlap considerably, the field is marked by a yellow circle. As CAQDA expert Friese (2014, p. 190) notes, this yellow circle signals that even if the coefficient is small, it might be worth taking a look at the data (respondents’ words) in the cell. Friese (2014) offers this explanation of the mathematics behind the c-coefficient: “The coefficient is based on the ‘Normalized Cooccurrence’ measure as used for quantitative content analysis. In the case of pairwise cooccurrence, that is co-citation frequency between two and only two terms  $k_1$  and  $k_2$ , the C-index is given by Eq 1:  $C_{12} - \text{index} = n_{12} / (n_1 + n_2) - n_{12}$  where:  
 $c_{12} = 0$  when  $n_{12} = 0$ , i.e.,  $k_1$  and  $k_2$  do not cooccur (terms are mutually exclusive)  
 $c_{12} > 0$  when  $n_{12} > 0$ , i.e.,  $k_1$  and  $k_2$  cooccur (terms are non-mutually exclusive)  
 $c_{12} = 1$  when  $n_{12} = n_1 = n_2$ , i.e.,  $k_1$  and  $k_2$  cooccur whenever either term occurs.”

## School Site Selection

In order to identify potential teacher collaborators for the design-based research, I visited elementary, middle, and high school classrooms in the San Francisco Bay Area and Southern California. Three major criteria guided my selection of school sites. First, it was a priority for me to select a study site with students from a wide range of sociocultural backgrounds who would bring their expansive repertoires to the school. Second, I wanted to learn about use in a classroom where students regularly engaged in digital talk via Subtext, with “regular engagement” defined as at least three times a week. Finally, it was critical to select a school where the technological infrastructure (e.g., reliable wireless internet connection, regular access to iPads and texts on Subtext) would support an ongoing study of digital talk.

At my request, the educational technology company behind Subtext provided me with the contact information of teachers who had expressed interest in opening their classrooms to guests who wanted to know more about Subtext use in schools, and were geographically close to UC Berkeley. Geographical proximity (i.e., a school site in reasonable driving distance or a short flight away) was an important consideration because I hoped to be a regular visitor if permitted by the various stakeholders (teachers, students, parents, administrators) at the schools. The ed tech company provided the names and email addresses of 11 teachers at six schools during the summer of 2014. Five of the schools were located around the Bay Area and one school was in Southern California. Three of the schools were public and three were private (one parochial, two independent), and the 11 teachers taught grade levels ranging from fifth grade to eleventh grade. I sent each teacher an email introduction explaining my interest in learning more about their uses of Subtext with their students, and I asked the teachers if they would be open to having a researcher visit their classrooms in the fall.

I heard back from six teachers during the summer/early fall and spoke with them on the phone to answer questions, learn more about their plans for using Subtext in the upcoming school year, and begin developing rapport. Following these calls, I arranged visits to five classrooms during the fall semester (the sixth teacher was not able to finalize a visiting schedule due to state-mandated testing). These visits allowed me to see generally how Subtext was used in elementary, middle, and high school classrooms and to learn more about the school environments. I spent two to four days visiting each of the classrooms during fall 2014. Based on these observations, two of the schools, Cedar Valley Elementary School and Oceanside College Preparatory, best fit my study’s purposes.<sup>14</sup>

## School Sites

**Cedar Valley Elementary School.** Cedar Valley is a public K-5 elementary school located in a suburb of a Southern Californian coastal city. Cedar Valley students come from various cultural and socioeconomic backgrounds. During the 2014-2015 school year, the school enrolled 489 students (45% female, 54% male). Seventy-two percent of the students identified as White, 14.1% identified as Latina/o, 1.6% identified as Black, .2% identified as Native American, .2% identified as Pacific Islander, 5.1% identified as Asian, and 6.7% identified as multiracial (Figure 2.6). Nine percent of the students identified as English language learners, and

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<sup>14</sup> Pseudonyms for the two schools.

15% of students qualified for free or reduced lunch during the 2014-2015 school year.

Cedar Valley is a technologically well-resourced school, as its Apple Distinguished School designation suggests.<sup>15</sup> Each classroom has a mounted projector, large screen, and document camera, and the wireless internet connection is relatively stable. At the time of the study, the school’s three third-grade classes and three combined fourth and fifth-grade classes were part of the school’s 1:1 iPad program, and the other grades shared access to several iPad class sets. During informal conversations with teachers, I learned that their principal, Mr. Williams, had worked with the district to bring the 1:1 program to Cedar Valley Elementary. One teacher told me, “When we had our first cart of 28 iPads for 16 teachers and we had a checkout schedule, [Mr. Williams] kept saying, ‘Keep checking it out. We want that calendar booked so we can go back and ask for more.’” Another teacher confirmed that “technology is one of the pushes he stands behind.” In addition to having administrative support, technology use

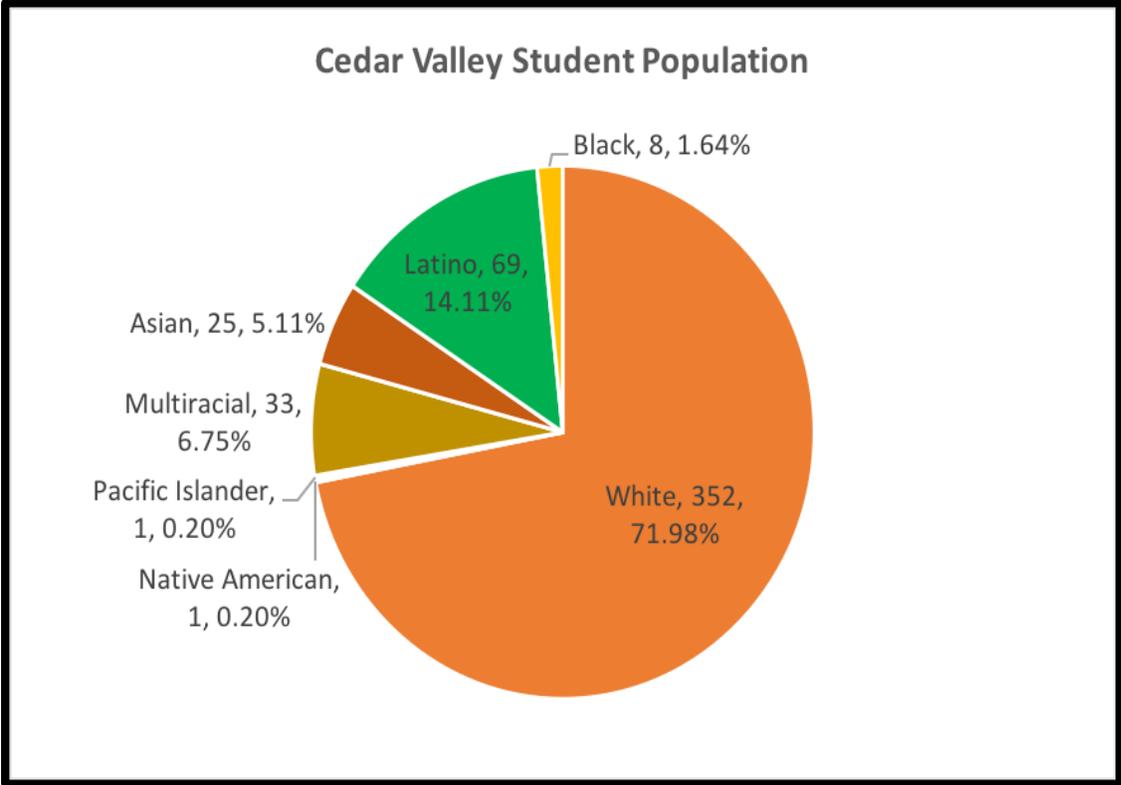


Figure 2.6: Student population at Cedar Valley Elementary.

<sup>15</sup> The Apple Distinguished School program is a recognition program for public and private K-12 schools that, according to the Apple website, “use Apple products to inspire student creativity, collaboration, and critical thinking.” Requirements for selection include an established 1:1 iPad or Mac program for students and faculty for more than two academic years; faculty proficiency with iPad or Mac; and innovative use of the Apple platform.

also figures prominently in the school's vision of learning and teaching. The Cedar Valley Elementary website states that the school uses iPads

to replace a one-size-fits-all curriculum with one where students can own their learning through one-size-fits-one learning ... Students balance traditional and digital learning to create communities for collaboration, research, and analysis, and to learn at their own pace and in their own way. Facilities and schedules are designed to maximize learning opportunities provided by technology. Teachers have regular iPad training seminars, bimonthly planning sessions, peer feedback, and discussions of best practices.

Through my conversations and observations at Cedar Valley, I learned that training seminars and planning and peer feedback sessions about educational technology were in fact fairly regular; however, these professional development opportunities were organized informally by teachers as sessions for sharing lesson plans and "tales from the trenches" and did not necessarily address the school's broader learning and teaching goals. Teachers reported having access to technical support (i.e., troubleshooting), but at the time of the study there was no appointed person at the district level who addressed issues related to technology use and pedagogical goals.

**Oceanside College Preparatory.** Oceanside is a parochial high school in a Bay Area city. Situated in a quiet neighborhood near major public transportation lines, Oceanside draws students from diverse social and cultural backgrounds from around the city. During the 2014-2015 school year, the school enrolled 717 males and 762 females in grades 9-12. Sixty percent of the students identified as White, .27% identified as Native American, 6% identified as Black, 3% identified as Latina/o, 17% identified as Asian, and 14% identified as multiracial (see Figure 2.7). While the majority of students were Catholic (1,167 students; 79%), smaller percentages of students reported non-Catholic Christian (222 students; 15%) or non-Christian (88 students; 6%) religious affiliations, or no religious affiliations (2 students; 0.1%). Over half the Oceanside student population received need-based financial assistance in the 2014-2015 school year.

The technological infrastructure at Oceanside is well-maintained. There are two computer labs with recent model desktops and printers that are available for student and teacher use, although I noticed that most teachers used their school-issued or personal laptops to take attendance, create class documents, and share media with their students. Each classroom has a mounted wall projector, projector screen, and document camera. Students and teachers have school email accounts as well as access to Oceanside's relatively stable wireless internet connection. Additionally, Oceanside has a 1:1 iPad program. The school attempts to support the use of iPads in classrooms by making affordable iPad rentals available to students who do not own a tablet. The school has a two-person technology support team that is primarily responsible for troubleshooting technical issues (e.g., internet access, email login problems), placing necessary technology orders, and organizing technology updates and keeping the school informed about those updates.

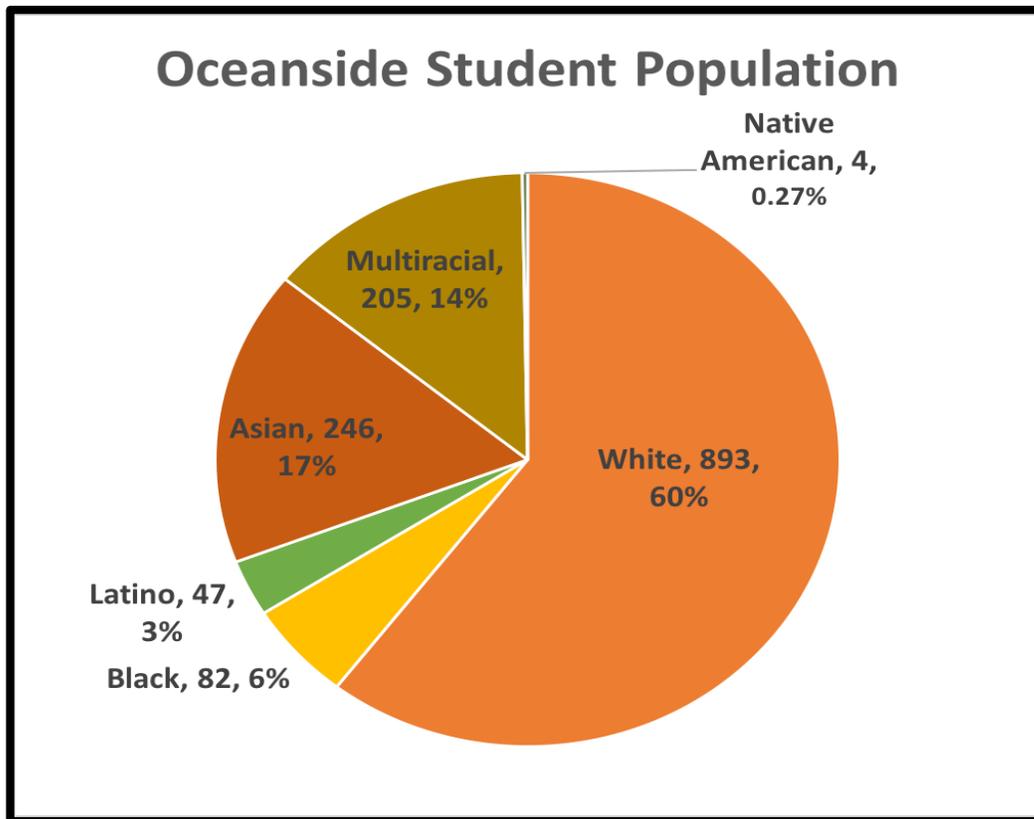


Figure 2.7: Student population at Oceanside College Preparatory.

### Participants

**Lisa (Mrs. G.).**<sup>16</sup> My collaborating teacher at Cedar Valley Elementary, Lisa, is a White female in her early 40s. A local with deep roots in the community (her father owned a ranch in the area and she herself attended Cedar Valley Elementary School), Lisa was in her 19<sup>th</sup> year of teaching in the district at the time of the study. When we met, she was teaching a combined fourth and fifth-grade class but she had also taught first, second, and third grades at Cedar Valley. Not only was she a veteran teacher, she was also regarded by her colleagues as an excellent one; during the period of our collaboration, she was named Teacher of the Year at Cedar Valley as well as one of three Teachers of the Year for her district.

Lisa emphasized a particular approach to learning among all her students, as she told me during one of our early conversations: “Experiment. Fail. Learn. Repeat.” She said it was her priority to “create an environment where students take risks, make mistakes, and take ownership of their learning.” For Lisa, an important part of establishing this kind of environment was the regular use of digital technologies to connect learners in meaningful ways. For example, she and her students participated in the Global Read Aloud program<sup>17</sup> and were reading and talking about

<sup>16</sup> Pseudonym.

<sup>17</sup> Global Read Aloud is a yearly six-week program in which classrooms around the world can sign up to read a common book together and make global connections as they read through Skype, Twitter,

the Kate DiCamillo novel *The Miraculous Journey of Edward Tulane* with students in Australia through Skype read-aloud sessions and live tweeting (posting of comments on Twitter while an event is taking place). Her students also published stories and essays on the monitored K-12 blogging site Kidblog and responded to their classmates' writing and pieces written by students in other states and countries. Weaving these different technologies into everyday classroom life, she said, provided opportunities for students "to take ownership, push their thinking, and express themselves." Furthermore, she found digitally mediated and collaborative learning a necessity in preparing students for their futures, even if teachers were uncomfortable with attendant shifts in power dynamics:

[Students] need to be literate [with technology] and they need to be able to utilize tools within a purposeful framework because we don't know what their future is gonna look like for them, so we need to help support that. Times are changing where teachers should not be the sole audience ... [but] a lot of teachers don't like giving away power. But if you want kids to make good decisions, you have to give them decisions to make, not under this caveat of "I'm the teacher and this is how it's done." And that's exactly where we are with technology right now. When we were in school, it was like, "Teachers know everything." Now it's not the case, we've got things like Google, and now it's okay as a facilitator to feel like, "I don't know but there's someone in this room that does." There's always gonna be someone else in the room who will know more, and those people are usually not the teacher. So we need to use that kind of crowdsourcing to learn.

The role of the teacher, according to Lisa, was to facilitate learning across multiple sources and to provide students with ongoing opportunities to engage with and learn from various perspectives. She saw these pedagogical and epistemological stances as fundamental to supporting students' imagined futures in a world made increasingly accessible and interactive with new technologies.

When I contacted Lisa about visiting her classroom, she had been using Subtext with her students for almost two years. During our initial conversation, she told me that she had been motivated to adopt the app for a number of reasons. From a lesson planning angle, she emphasized the importance of being able to upload her own texts to Subtext, a feature that she found missing in other K-12 e-reader apps such as Curriculet: "I like the choice of deciding what I'm gonna use, I'm curating it. I don't need a script that says, 'This is what you should be teaching or using.'" The greatest draw for her, however, was being able to interact with her students through the commenting tools. The dictionary, highlighting, and tagging features were very useful for her developing readers, she said, but she most valued the discussion features because they made ongoing communication channels possible. She said that being able to "interact on the side [of the page]" with the commenting tools allowed her to guide students through a text and assess evolving understandings in real time, creating a different reading experience:

I think in the past, when as a teacher, you'd say, "Ok, you need to go and read this chapter, and then answer these questions at the end," that's a whole different thing from

when you're asking them or answering them while you're reading. Then I can check to see if you're in fact doing [the work] and if you aren't, where exactly your understanding is broken down, to get the reader before they slide too much.

While she found the teacher-student communication channel invaluable, what Lisa hoped to implement more consistently moving forward were opportunities for students to “leverage the knowledge that everyone has” in everyday classroom learning. She envisioned “get[ting] to the point where the kids are reading and discussing, and I’m looking through Subtext, walking around the room with my iPad and checking in on what they’re doing, what their discussion is.” However, she was still grappling with how to support students in learning how to interact with each other in the digital setting. Getting support around this issue, she said, was the reason why she was interested in a visit from a researcher (me). “This is where I see education going,” she explained, “they’re [the students] going to be online . . . and there’s the authentic audience piece and also the digital citizenship piece. There are lots of choices they have to make when they’re reading and responding online, and I wonder what are the different ways teachers can help them along.”

During my first visit, I learned that Lisa had started to teach her students about writing online for different audiences by using a set of guidelines that she referred to as SPECS (Figure 2.8). She developed these guidelines—which asked students to compose comments that were **S**pecific to the topic, demonstrated appropriate **P**unctuation, used **E**vidence from the text (or “the because,” as Lisa put it), were **C**onsiderate of the audience (“That’s the digital citizenship piece: what am I commenting, why, and what are people gonna think about that commenting?”), and consisted of at least two **S**entences (“You’d be amazed at the thinking that gets unlocked with that second sentence”)—after seeing her students’ peer feedback posts for paragraphs shared on Edmodo, an educational social networking website. As she explained,

I got them all logged in and they posted a paragraph about their Halloween. And then they were asked to post a response to other people's paragraphs. What was happening was comments like, "Oh, that's so cool" or random things like “I love rainbows” or just emoticons across posts – not something you would use in an academic environment. So I needed to take a step back, to teach about proper academic posting.

What Lisa had observed, in other words, was a need to provide explicit support around academic and nonacademic registers. The SPECS guidelines seemed to help students think about purpose and audience, but she said that she had to constantly remind them to think of these guidelines when they were interacting online for assignments. Digital interactions in Subtext were what she called “a work in progress,” but she believed that they were “an untapped resource for [students]” that could become “a powerful way of getting at common and different understandings.”

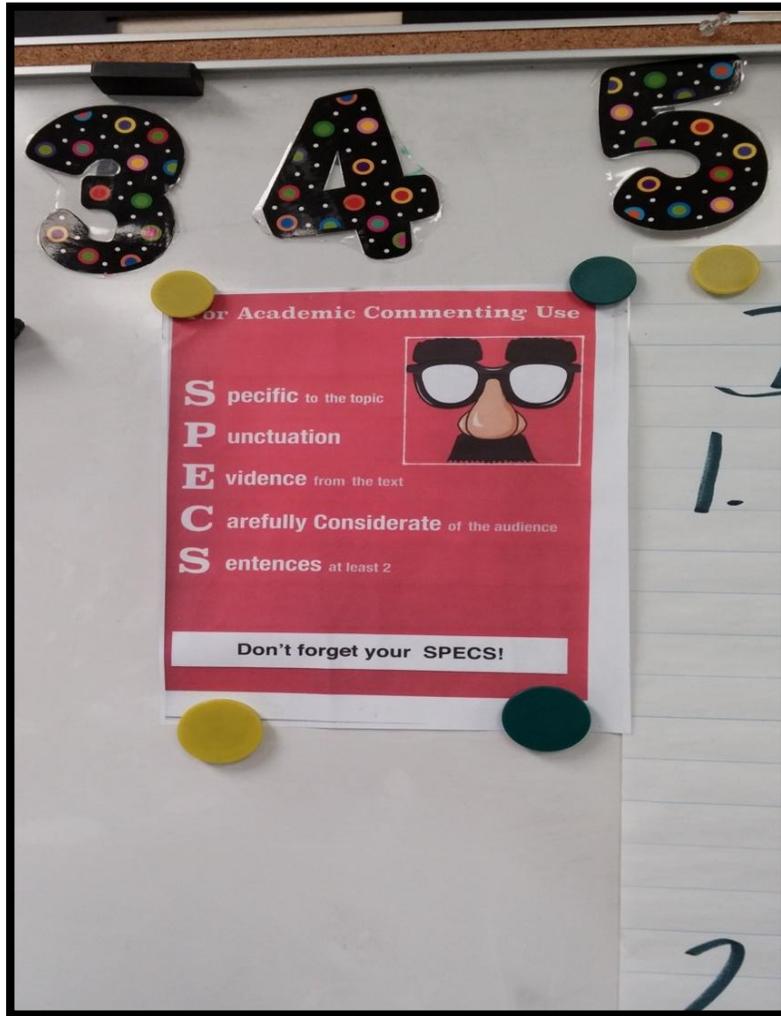


Figure 2.8: Lisa's SPECS guidelines for Subtext comments.

Lisa's interest in supporting meaningful online dialogue among her students was reason why she invited me to visit during my Phase 1 observational period, and it also made the Phase 2 teacher-researcher collaboration in the spring appealing to her. When I asked if she might be interested in exploring ways to support the kind of student talk she envisioned in Subtext, she responded enthusiastically. She said that even though she felt like "a 9.5 out of 10 in terms of comfort with educational technology, doing all these apps and programs justice requires having the time to do that." As a busy teacher, mentor to colleagues, and mother of two young children, Lisa viewed a research collaboration as an opportunity to explore her questions about fostering consequential digital interactions. In other words, her aim was to develop dialogic digital talk among her students, as it is for many teachers who adopt this app.

Lisa taught 27 students in her combined fourth/fifth grade class (15 males, 12 females), whom she collectively addressed as "Scholars" during whole-group talks and assemblies. Nineteen percent of the students were from underrepresented communities (two Latino students

and three Asian students), and Lisa reported that all 27 read at grade level. Her students had been using Subtext starting the first month of school, so they were all comfortable using Subtext to read, highlight, and comment on class texts by the time I visited in October. This also meant that there was an established record of digital talk that I could review to understand how digital talk was organized in Lisa's class prior to our collaborative work. Students used Subtext to read a variety of texts, but most of their readings were nonfiction magazine and newspaper articles. These articles covered a wide range of topics, as this sampling of titles suggests: "Earthquake Terror"; "Introduction to Brainology," "Norwegian Cows Get Full Pampering in Bosnia," "Texas Dog Escapes Backyard, Travels Far," "Australian Woman Is Fastest up 86 Flights of Stairs," "Scientists Create a Ring That Can Read to the Blind in Real Time."

Lisa's classroom environment reflected her visions for her students. Posters and decorations alluded to intellectual pursuits, global citizenship, risk taking, independence, and perseverance. A large bulletin board that displayed student work announced the classroom as "Scholar University," and cut-out letters spelling "Cogito" ("I think" in Latin) stretched above the projector screen. The spatial organization of Lisa's classroom was quite striking. Alongside 12 traditional desks and table sets, there were low tables, stools, bean bags, and cushions placed around the room. A classroom norm was that students had the choice to work wherever they felt they could make their best effort. During my time in Lisa's class, I became used to seeing students work on their stomachs, sitting at traditional desks, kneeling at tables, perching on stools, and leaning against bookcases (Figure 2.9). Lisa explained, "I like it that way because it kind of gives them their own space ... with them being kind of separated out, they have the opportunity to really dive in, to get comfortable before they're reading or asked to do something."



Figure 2.9: Students at work in Lisa's classroom.

**Peter (Mr. B.).**<sup>18</sup> My collaborating teacher at Oceanside, Peter, is a White male in his late 30s. At the time of the study, he was in his ninth year of teaching English, six of which he had spent at Oceanside. Peter primarily taught English 9 and 11, and he also coached the Junior Varsity basketball team. He had majored in economics and minored in English at his undergraduate institution. Following a three-year period working in marketing, Peter returned to school to finish his English degree and to earn his teaching credential in English. He shared in our conversations that he was not satisfied with his credential program because the theories and strategies introduced in classes seemed too abstract. Based on his experiences, he explained, teacher education was where “you learn these strategies and you see them and why they work, but they all kind of seem the same and they all have a fancy name attached to them.” In contrast, he wished coursework “was more like [the] student teaching experience.” For him, his semester of student teaching in a large high school was a much more powerful and relevant source of professional learning. Illustrating his perception of the gap between learning a “fancy name” and classroom application, Peter noted that he did not receive training in how to facilitate classroom discussions, even though many of his instructors described discussion as an important learning resource.

Peter had already been using Subtext for a year with his English 11 students when I contacted him about visiting his classroom. Although he described himself as “not an expert with technology,” he was a strong proponent of adopting Subtext for literary study with his students for several reasons. From a teacher planning angle, the Subtext dashboard feature appealed to him because it instantly showed students’ progress through a text (see Figure 2.10 for an example of the Subtext dashboard progress feature). Having access to this information helped him change lesson plans as needed. For example, if he noticed that many students had not completed a reading, he would have the ability to change or even postpone a related activity and talk with the students about why they had not completed a reading. Peter noted that this immediate snapshot of student progress offered the additional benefit of “holding [the students] accountable for reading” without the daily reading quizzes that some of his colleagues distributed to their students. In other words, rather than handing out and grading reading quizzes meant to keep students “on their toes,” Peter could use the progress tracker to check that students had completed the reading. Peter also appreciated the ease of storing all class materials and distributing assignments. As he explained, “It gave me one place to have an assignment, to assign a reading, instead of it being in three different places: ‘Read this, here’s the handout for guided questions, here’s the handout for what you should be highlighting.’ Now it’s all in one place and [the students] can access it whenever they need to.”

Although these planning-friendly features of Subtext certainly helped make the app’s adoption attractive to Peter, he noted that the main reason he had brought Subtext into his classroom was to provide opportunities for students to engage with their classmates around a text. He had hoped that Subtext would offer a different collaborative space for literary discussion, where all his students would “feel more inclined to participate, and it’s not the same four or five students [in face-to-face discussions] doing all the talking.” He viewed talking as an important learning resource for students, and he wanted to leverage the digital space to offer expanded discussion opportunities for students who weren’t the “same four or five students” regularly participating in face-to-face class discussions. However, his experiences with using

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<sup>18</sup> Pseudonym.

Subtext for over a year in his English 11 classes had shown him how difficult it was to achieve this goal. He voiced dissatisfaction with what he described as the perfunctory nature of many class discussions, but he was particularly disappointed with the discussions in Subtext. As he shared during one of our first conversations,

I guess this is the biggest thing ‘cause I want to make the work that they do in Subtext worthwhile. I don't want it to be something where they're like, “I just want to submit it” and it’s thrown away ... Where we're actually using [Subtext discussions] and it's becoming -- it's a big resource to them and to all of us in here. I want them to use [Subtext discussions] -- like that is their tool to always be able to look back [on].”

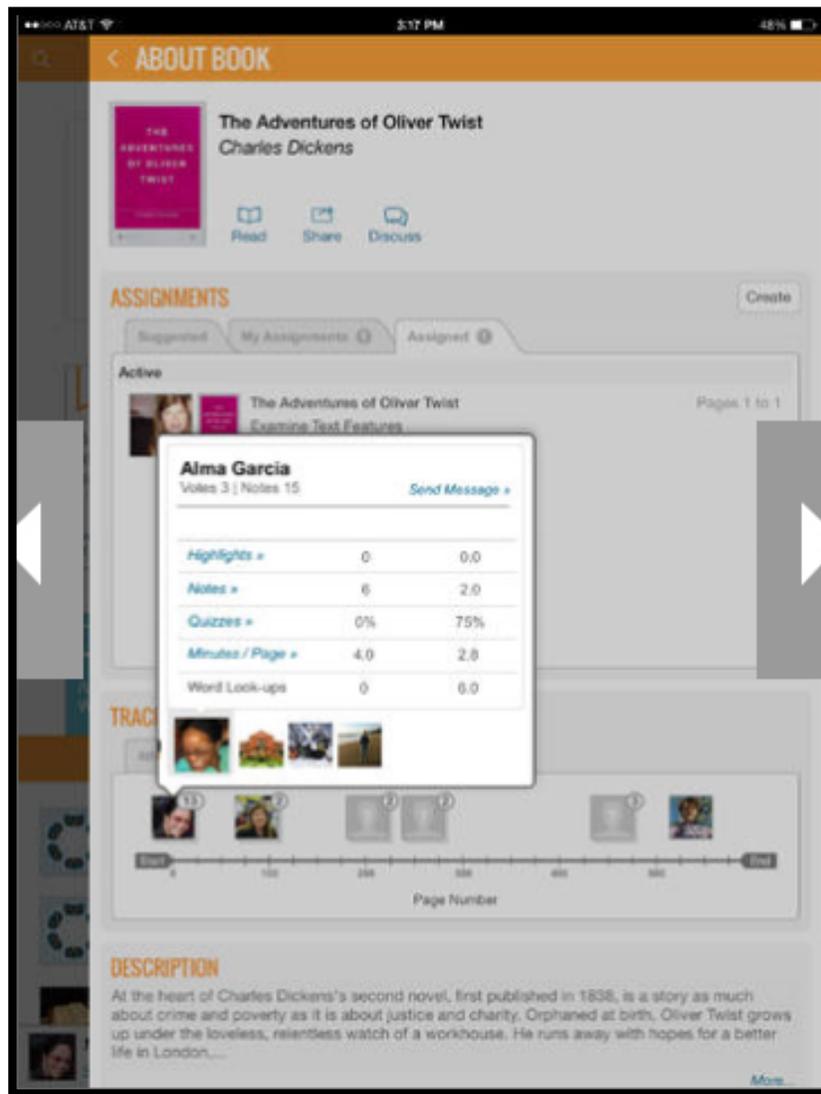


Figure 2.10: The Subtext dashboard showing a student’s activity (in the pull-out box) and the group progress tracker near the bottom of the dashboard.

What Peter saw among many of his students was a “submit it and forget it” approach to digital talk participation, but he wanted digital talk to function as tool that mediated consequential discussions about class texts and opportunities to build on collective knowledge. Like Lisa, his objective was to foster dialogic digital talk among his students.

The ongoing challenge of fostering collaborative discussion in Subtext was what compelled Peter to invite me into his classroom. As the only teacher in his department using Subtext, Peter viewed access to another educator who was familiar with both the digital tool and language arts content knowledge as a benefit. He told me that he knew he needed to “organize a new way to do [Subtext discussion]” but that he had difficulty finding the time “to sit down and hammer it out.” The demands of Oceanside’s unusual class schedule,<sup>19</sup> two class preps (English 9 and English 11), and his duties as father, husband, and Oceanside’s basketball coach pulled Peter in many directions. He viewed our design collaboration as a way to make the time to “hammer it out” with some professional support.

Peter taught both English 9 and English 11, but we focused on his English 11 (Period 1) class for our collaboration because Subtext was used to read almost all of the 11<sup>th</sup> grade class texts. This meant that there was an established history of digital talk participation to reference when I first began visiting Period 1 in December, as well as regular, ongoing opportunities for students to engage in digital talk throughout the study period. It also meant that we were working with students who were already familiar with using Subtext, which allowed us to turn our attention immediately to the digital talk rather than investing time in technical tutorials.

Period 1 consisted of 27 students, 14 females and 13 males. Similar to the broader school composition, 30% of the students were from underrepresented communities (four Latina/o students and four Southeast Asian students). None of the students identified as English language learners. Each student owned an iPad or rented an iPad from Oceanside, and based on what I saw during my class visits, all students were comfortable using Subtext to read, annotate, and comment on class texts. Students sat in groups of four (Figure 2.11), which Peter had assigned at random at the beginning of the year. The reason for having these groups, Peter told me, was to provide students with opportunities to engage in small group discussions and collaborative projects.

Peter did not have a single assigned classroom but rather shared two classrooms with other English department colleagues, Ms. Draper and Mr. Jenkins. This is likely the reason why the classroom that Period 1 used felt a bit “borrowed.” The walls in the classroom featured student work from Ms. Draper’s classes (to whom the classroom was assigned) and a large banner printed with “Ms. Draper’s Room” hung at the front of the classroom. Peter spent most of class time standing at the front of the room by the podium (while giving directions or lecturing), sitting behind the podium (during discussions), or moving between small groups to help students.

Period 1 met on Mondays, Wednesdays, and Thursdays, and Subtext was used in each class during the study period to anchor activities such as face-to-face discussions (pair-shares,

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<sup>19</sup> Oceanside’s bell schedule is organized so that any given class meets but three times a week for two 60-minute sessions and one 80-minute session. There are seven class periods accommodated within this scheduling system, and no periods meet three days consecutively. This schedule was adopted by the administration to provide teachers with at least one longer period with their students, but Peter noted that he and several other Oceanside teachers find the schedule disruptive to learning and community-building because teachers and students do not see each other every day, and instructional time feels very limited with only three class sessions a week.

small group, and whole class), digital discussions, quotation hunts, and text highlighting and thematic tagging. Students used the learning management platform Canvas to access their assignments (e.g., worksheets, essay guidelines) and toggled between Canvas and Subtext for most of their class activities. Class texts included novels such as *The Scarlet Letter*, *The Adventures of Huckleberry Finn*, *The Crucible*, *The Great Gatsby*, and *Native Son*, short stories by Kate Chopin, Ernest Hemingway, and Anzia Yeziarska, and poems from the Harlem Renaissance and The Beats. Peter told me that while his department chair did not mind if he introduced some additional class texts, he was expected to adhere to the list of core English 11 texts, which had been established for nearly 15 years at the time of the study with little revision.



Figure 2.11: Seating arrangement in the classroom where Peter taught English 11. Peter often positioned himself near or at the podium that is pictured on the right.

### **Role of the Researcher**

As the other half of these two design teams, I intentionally worked to “study side by side” (Erickson, 2006) with Lisa and Peter. As a design researcher conscious of potential imbalances of power and agency related to “who designs and why” (Engeström, 2011), I align myself with Erickson’s side by side stance because it counters power dynamics that result from the institutionalization of “studying down” in conventional educational research. Working side by

side means that all study participants acknowledge the different expertise and experience that teachers and researchers bring to the table. Following this approach, I intentionally positioned myself as a thinking partner for a persistent, teacher-identified problem of practice. I am an experienced English teacher (I received my certification in secondary English instruction and taught six years in public middle and high schools), and I shared the teaching experience that I could bring to design work with both teachers at our initial meetings. Knowing that I was also a former teacher and not “just” a researcher seemed to be reassuring to both teachers. I also explained that I wanted to help them work through an issue that they wanted to address. I let them know that I was not interested in taking on any type of instructional role during the course of our design work. I viewed Lisa and Peter, experienced teachers with 28 years of classroom instruction between them, as professionals and experts of their particular contexts. Although it is common practice for design-based researchers to take charge of implementing an intervention, acting in a behind-the-scenes supporting role better aligned with my understanding of teacher-researcher collaborations. Accordingly, the teachers and I planned and reflected together to shift digital talk practices over the course of iterative design cycles, but when it was time to take our ideas “live,” Lisa and Peter always led their classes while I observed and collected data as unobtrusively as possible.

With the students, I aimed to position myself as a friendly, unassuming observer rather than someone who was looking for specific displays of academic competence. To this end, I introduced myself to Cedar Valley and Oceanside students as a UC Berkeley graduate student who was visiting because I was interested in studying how teachers and students use a digital tool like Subtext. By positioning myself as a student who was eager to learn from them, I hoped to make my presence (and my recording devices) as unthreatening as possible. After introducing myself, I explained the study and read through the consent letter with the students. Students and parents received consent letters and returned them through the teachers.

## **Data Collection**

I collected a variety of qualitative data in Lisa’s and Peter’s classrooms over two phases between October 2014 and May 2015 (see Table 2.3). The first phase, which took place during October (Lisa) and December and January (Peter), was a period of preliminary data collection where I spent time observing and video and audio recording classes, reading through students’ and the teachers’ digital talk interactions, and talking with the teachers. The purpose of this phase was to gain in-depth understandings of everyday classroom life, the instructional talk practices in which the students and the teachers engaged, and how digital talk was embedded in the different classroom ecologies. During this period, I learned about the two teachers’ ideas and concerns about talk (digital and nondigital) in their classes, as well as their interests in exploring digital talk with students. At the end of these first phase classroom visits, I asked the teachers if they would be interested in exploring shifting digital talk practices in ways that matched their objectives. They were both enthusiastic about trying out some changes.

Table 2.3: Data collection phases and description of the data.

	Phase 1	Phase 2
Lisa	<p>October 2014</p> <p><i>Preliminary data collection</i></p> <ul style="list-style-type: none"> <li>● Semi-structured teacher interview</li> <li>● Informal conversations with teacher before, during, and after class</li> <li>● Audio &amp; video recordings of class sessions</li> <li>● Digital talk data</li> <li>● Class documents</li> <li>● Field notes</li> <li>● Analytic memos</li> </ul>	<p>May 2015</p> <p><i>Design-based research collaboration</i></p> <ul style="list-style-type: none"> <li>● Audio recordings from team design and reflection sessions</li> <li>● Audio &amp; video recordings of class sessions</li> <li>● Digital talk data</li> <li>● Class documents</li> <li>● Field notes</li> <li>● Analytic memos</li> </ul>
Peter	<p>December 2014 to January 2015</p> <p><i>Preliminary data collection</i></p> <ul style="list-style-type: none"> <li>● Semi-structured teacher interview</li> <li>● Informal conversations with teacher before, during, and after class</li> <li>● Audio &amp; video recordings of class sessions</li> <li>● Digital talk data</li> <li>● Class documents</li> <li>● Field notes</li> <li>● Analytic memos</li> </ul>	<p>February 2015 to March 2015</p> <p><i>Design-based research collaboration</i></p> <ul style="list-style-type: none"> <li>● Audio recordings from team design and reflection sessions</li> <li>● Audio &amp; video recordings of class sessions</li> <li>● Digital talk data</li> <li>● Class documents</li> <li>● Field notes</li> <li>● Analytic memos</li> </ul>

During the second phase, the active design collaborations that took place during February and March for Peter and May for Lisa, I collected data related to our design, reflection, and redesign cycles as the teachers and I attempted to shift digital talk practices. I audio recorded each of our design and reflection meetings. To capture Lisa's and Peter's implementation of our designs and students' interactions in those designed sessions, I audio and video recorded classes and collected digital talk threads in the texts the students were reading during the study period. I also collected non-digitized classroom artifacts such as class agendas, assignment handouts,

discussion rubrics, dialogic language stems, and project guidelines. For Lisa’s class, I also collected baseline and post-design assessments of students’ knowledge of the concept of theme. During both phases, I wrote analytic memos to reflect on the social world of Peter’s and Lisa’s classes, our design processes, hunches about our lesson designs, perceptions of how students received our designs, questions and challenges, and emergent working theories.

**Data sources.** I detail here the data collected across the two design collaborations via six primary data sources: semi-structured teacher interview; informal conversations with the teacher; class observations; design and reflection sessions; digital talk data; and classroom documents (see Table 2.4 for summary of sources).

Table 2.4: Data sources for design collaborations with Lisa and Peter.

Data Source	Description
Semi-structured teacher interview	Phase 1: <ul style="list-style-type: none"> <li>• Lisa: One semi-structured interview (40 minutes)</li> <li>• Peter: One semi-structured interview (40 minutes)</li> </ul>
Informal conversations with teacher (“conversation” defined an exchange that lasted 90 seconds or more before, during, or after a class session)	Phase 1 <ul style="list-style-type: none"> <li>• Lisa: Eight informal conversations ranging from approximately 5 minutes to approximately 15 minutes</li> <li>• Peter: Seven informal conversations ranging from approximately 90 seconds to approximately 10 minutes</li> </ul> Phase 2 <ul style="list-style-type: none"> <li>• Lisa: Four informal conversations ranging from approximately 90 seconds to approximately 3-4 minutes</li> <li>• Peter: Two informal conversations ranging from approximately 90 seconds to approximately 3-4 minutes</li> </ul>
Class observations	Phase 1 <ul style="list-style-type: none"> <li>• Lisa: Three three-hour class sessions</li> <li>• Peter: Three 60-minute class sessions, two 80-minute class sessions</li> </ul> Phase 2 <ul style="list-style-type: none"> <li>• Lisa: Six 50-60-minute sessions</li> <li>• Peter: Four 60-minute class sessions; two 80-minute class sessions</li> </ul>
Design and reflection sessions	Phase 2 <ul style="list-style-type: none"> <li>• Lisa: 10 design and reflection sessions (approximately 30 minutes to 1.5 hours each)</li> </ul>

	<ul style="list-style-type: none"> <li>● Peter: Nine design and reflection sessions (approximately 30 minutes to 45 minutes each)</li> </ul>
Digital talk data	<p>Phase 1</p> <ul style="list-style-type: none"> <li>● Lisa: 48 digital talk threads from two novels excerpts (13 threads); four short stories (19 threads); 16 non-fiction articles (57 threads)</li> <li>● Peter: 63 digital talk threads from <i>The Adventures of Huckleberry Finn</i> (33 threads) and <i>The Scarlet Letter</i> (31 threads)</li> </ul> <p>Phase 2</p> <ul style="list-style-type: none"> <li>● Lisa: 60 digital talk threads from three poems (Cycle 1); 28 threads from three poems (Cycle 2); 54 threads from two poems (Cycle 3)</li> <li>● Peter: 8 digital talk threads from two short stories (Cycle 1); 29 threads from one novel (Cycle 2)</li> </ul>
Classroom documents	<p>Phase 1</p> <ul style="list-style-type: none"> <li>● Lisa: SPECS guidelines; handouts from individual and small group assignments; class agendas</li> <li>● Peter: Small group work guidelines; final exam review guides; quotes partner quiz; class agendas</li> </ul> <p>Phase 2</p> <ul style="list-style-type: none"> <li>● Lisa: Baseline assessment for theme and post-design assessment for theme; handouts of poems; photos of posters; class agendas</li> <li>● Peter: Fishbowl discussion guidelines and rubric; dialogic language stems handout; <i>Native Son</i> cumulative project guidelines; class agendas</li> </ul>

***Semi-structured teacher interviews.*** I conducted a 40-minute semi-structured interview with each teacher at the beginning of our Phase 2 collaborations. For me, collaborative work with practitioners must be rooted in knowledge about the kinds of experiences and expertise each person brings to the partnership. I viewed this interview as an important opportunity for two-way information sharing. I wanted to learn about the teachers' histories as educators and their teaching experiences, and I also wanted to provide an opportunity for them to ask questions that would help them understand who I am and what I could contribute to the work. I asked questions

to learn about the teachers' histories as educators; their experiences teaching at Cedar Valley and Oceanside; their perceptions of their students; their access to and participation in professional development; their experience with technology in the classroom; their reason(s) for using Subtext with their students; their understandings of affordances and constraints related to teaching and learning with Subtext (Appendix C). Peter and Lisa mostly wanted to know about my teaching background, how I developed my research interest in Subtext, and what I hoped to do after my graduate program. I did not adhere strictly to my interview protocol linearly but took a more conversational approach, letting our answers and questions shape the flow of the conversation. The interviews were audio recorded with the teachers' permissions. I chose not to take notes during the interviews to engage fully in the conversation. Following each interview, I wrote a memo recording my thoughts and impressions, and I also transcribed the audio recording. As I knew I would analyze the interviews for themes, I did not use conversation analysis levels of detail (e.g., exhales, pauses, emphasis) but transcribed what the teachers said using standard orthography.

***Informal conversations with teachers.*** The teachers and I had a number of informal conversations before, during, and after class. These varied in length from approximately 90 seconds to approximately 15 minutes, with the shorter exchanges taking place during class and the longer ones taking place before or after class. These informal talks served a variety of functions, including rapport-building (e.g., sharing spring break plans); learning about aspects of life at Cedar Valley and Oceanside (e.g., administrative support, the school climate, technology access, scheduling issues); asking about a learning activity (e.g., if I did not know the history of an activity that the students were doing in class or for homework, I would ask the teachers); clarifying design (e.g., reviewing a lesson plan together before the students arrived); explaining unplanned design changes (Lisa and Peter occasionally would make "mid-flight" corrections to a designed lesson based on their judgment, usually in relation to time); and assessing student interactions in face-to-face or digital settings (e.g., during small group work or whole group discussions in Subtext). The teachers and I had fewer informal exchanges during Phase 2 because we had more opportunities to talk at length during our design and reflection sessions. I did not record our informal conversations but rather took extensive notes, or what Emerson, Fretz, and Shaw (1995) call "jottings," as soon as I returned to my desk. I elaborated on these jottings and incorporated them into the formal field notes that I wrote for each classroom observation.

***Class observations.*** During Phase 1 in Lisa's class, I observed for three three-hour sessions in October 2014. In Peter's class, I observed for three 60-minute sessions and two 80-minute sessions in December 2014 and January 2015. During Phase 2 in Lisa's class, I observed for six 50-60-minute sessions. In Peter's class, I observed for four 60-minute sessions and two 80-minute sessions. During class observations in Lisa's class, I typically positioned myself by the wall near the students during whole-class discussions so that I could see all the students and record data. When students were working individually, I sometimes would walk around the room to see what students were doing. I placed my audio recorder and video camera on a tripod near me during whole-class discussions, and I would carry them around when I walked around the classroom. During class observations in Peter's class, I typically positioned myself at a desk near the door, a vantage point that gave me a clear view of almost all the students in their small group arrangements, as well as of Peter, who usually stood or walked around during class (during the study, I only saw him sit during the two fishbowl discussions). I placed my audio recorder on the

desk or on the floor in the middle of the room, and I moved around as needed to video record.

During sessions in both teachers' classes, I would take jottings in a small notebook (Emerson, Fretz, & Shaw, 1995) and develop these jottings into formal field notes after observation. My field notes, which I wrote within two hours of leaving a class, included detailed depictions of instructional activities (e.g., lecture, small group work, discussion, and question-answer sessions), thorough descriptions of the physical environment, and classroom climate features. I also described students and interactions among students. I paid particular attention to discussion activities, as defined by the teachers during Phase 1 (e.g., "Money Quote" activity, SPECS commenting) or as defined by both of us during Phase 2 (e.g., fishbowl discussions, partner responses to main idea posts). I transcribed sessions as soon as possible after the observed class, usually within the same week. For Phase 1 observations, I selectively transcribed observed activities related to discussion. For the designed lessons in Phase 2, I transcribed each class session in full. For transcriptions for both phases, I wrote what students and teachers said using standard orthography.

***Design and reflections sessions.*** Lisa and I met for 10 design and reflection sessions, each approximately 30 minutes to 1.5 hours long. For eight of these sessions we met in person and for two sessions we talked using the Google Hangouts video conferencing program. Peter and I met for nine design and reflection sessions, each approximately 30 to 45 minutes long. For seven of these sessions we met in person and for two sessions we talked on the phone. The teachers and I used these meetings to design, reflect on implemented designs, and to redesign lessons that would support our objective of dialogic digital talk. These meetings were informal in tone and held on an as-needed basis. For example, Peter and I met in person when we were considering research-grounded dialogic discussion tools to use with the students and followed up that conversation with a phone call to make decisions about which tools to use and what their implementation would look like. Also, design and reflection went hand-in-hand; sometimes reflecting would lead to spontaneous ideas for the next iteration, and designing new lessons always required reflecting on previous designs.

These conversations, while flexible and nonlinear, were guided by three broad questions:

1. "How do you think the lesson went?" I posed this question to help us reflect on the designed lesson in its entirety, including tools used, teacher implementation, and student participation.
2. "Did anything surprise you during this lesson?" The aim of this question was to help us reflect on assumptions that we might have brought to a given design and on what we learned when those assumptions were debunked.
3. "What can we change for next time to get closer to our goal?" This question was aimed to support thinking about how we might apply the lessons we learned from one design to the next iteration. Typically, we would each offer our suggestions for design adjustments ("What if we ...?") based on our different experiences and expertise and then negotiate problem-solving based on a variety of factors (e.g., time constraints, Peter's comfort level with implementing a particular strategy)

We usually reflected on a lesson and designed for the next iteration immediately after a class ended (during Lisa's lunch or break, and during Peter's lunch or free period). I audio recorded our in-person sessions and took jottings as we spoke. I turned these jottings into detailed field

notes within two hours of our conversation. For the phone and Google Hangouts sessions, I took jottings as we talked and then wrote full notes immediately after the calls ended. I transcribed these sessions as soon as possible after their conclusion, usually within the same week.

**Student and teacher digital talk data.** For both teachers' classes, I collected digital discussion threads in Subtext to understand how students interacted with one another and with their teachers via digital talk at different points of the study (e.g., before design work in Phase 1, during design work in Phase 2). Digital talk allowed me to track changes in students' thinking across the phases and to learn more about the students as learners and citizens of their particular class communities.

During Phase 1 in Lisa's class, I collected 13 talk threads from three novel excerpts (*Hatchet* by Gary Paulson, *Crash* by Jerry Spinelli, *A Long Walk to Water* by Linda Sue Park), 18 threads from three short stories ("The Legend of the Black Pearl," "The Six Swans," "Hope Was Here"), and 16 non-fiction articles. These texts were selected because they were the most recent that Lisa's class had read by my Phase 1 visits and therefore reflected students' interactions unhindered by a technical learning curve. During Phase 1 in Peter's class, I collected 33 digital talk threads from Mark Twain's *The Adventures of Huckleberry Finn* and 31 digital talk threads from Nathaniel Hawthorne's *The Scarlet Letter*. These texts were selected because they were the most recent novels that Period 1 read prior to the design work and therefore likely contained digital talk unaffected by lack of technical knowledge of Subtext functions or students' learning curves related to digital talk rules or conventions in Peter's class. These pre-design data helped me understand digital talk patterns in the two classes, and they also helped the teachers and me construct our baselines for measuring changes in students' digital talk during Phase 2. Discussion data were downloaded in a .csv file.

During Phase 2, I continued to track students' interactions as the teachers and I sought to reorganize digital talk practices. In Lisa's class, I collected digital talk threads related to our first, second, third, and fourth design cycles: 60 threads from the three poems in Cycle 1, 28 threads from the three poems in Cycle 2, and 54 threads from the two poems in Cycle 3. In Peter's class, I collected digital discussion threads related to our first, second, and third design cycles: nine threads from the Anzia Yeziarska short stories *The Lost Beautifulness* and *Soap and Water*, and 29 threads from Richard Wright's *Native Son*. These digital talk threads provided evidence that informed our conjectures, designs, working theories about digital talk, and artifacts created to support digital talk. As with the Phase 1 discussions threads, Phase 2 discussion data were downloaded in a .csv file.

**Classroom documents.** During Phase 1, I collected an assortment of documents that helped me understand teaching and learning in the two separate classrooms. These included daily class agendas, small group work guidelines, a partner quiz (completed in pairs), SPECS guidelines, individual work assignments, and final exam review sheets. During Phase 2, I collected class documents that the teachers and/or I created or sourced for the designed lessons, such as the Phase 2 baseline assessment in Lisa's class and the dialogic stems guidelines in Peter's class.

## Analysis

The results from design-based research often take the form of qualitative retrospective analyses (Cobb, Confrey, diSessa, Lehrer, & Schauble, 2003; Gravemeijer & Cobb, 2006), or the stories of designing and iterating in complex learning environments and the theories that emerge from those iterations. Design-based researchers conduct a meta-analysis of the entire design dataset to produce a design case, or a rich description of a problem of practice, its solution, and the design procedures for a particular design experience. After constructing a design case, researchers consolidate theoretical understandings and expand their localized focus to identify generalizations about implementation in contexts beyond those studied, or learning principles that may be applied in other learning ecologies. As Cobb and colleagues (2003) note, a primary objective when conducting a retrospective analysis is to place the design experiment in a broader theoretical context, thereby “framing it as a paradigm case of the more encompassing phenomena specified at the outset” (p. 13). In contrast, the analyses conducted while the experiment is in progress are often more oriented toward the goal of supporting the learning of the participants.

Data analysis was concurrent and continuous with data collection. To design lessons in ways that responded to students’ engagement with digital talk during the collaborations, the teachers and I analyzed student data in Subtext after each class session. We would look at digital talk threads (sometimes separately and sometimes together) and then discuss what we were noticing in the threads and if we felt the lesson had helped students move closer to the identified design objectives. These analytic conversations fed into and shaped our subsequent lesson designs (e.g., “Okay, so it looks like the students did X instead of Y. What if we tweak the plan and do Z? Will that help them get closer to Y?”)

To construct the retrospective analysis, I began the process by uploading the relevant data to the qualitative analysis program ATLAS.ti: field notes, transcripts of interview, class sessions, and design and reflection sessions, class documents, and digital talk data for the novels and short stories noted above. I first assigned descriptive codes to note type of artifact, observation phase, and design cycles. This created a broad tabular account of the contents of the data sets.

Following this organizational coding, I read through Phase 1 data for both design datasets and applied descriptive codes (Miles & Huberman, 1994; Saldaña, 2009) to summarize the basic topics of data passages. These descriptive codes were deductive in that some were drawn from my theoretical frames and research question and also inductive in that I looked for and marked items of interest and interpretations that emerged during my reading. The goal of this initial coding was to generate a list of highly contextualized descriptors to systematically illustrate the content of the data. From this first cycle of coding, I further reduced the data through pattern codes (Miles & Huberman, 1994) that identified themes related to classroom talk and mediation of learning in the data: “digital talk for teacher purposes,” “face-to-face-talk for teacher purposes,” “digital talk for student purposes,” “face-to-face talk for student purposes,” “dialogic organization of learning,” and “monologic organization of learning.”

For the Phase 2 design datasets, I read through the data and applied inductive and deductive descriptive codes guided by my research questions, my theoretical frames, and the research literature on dialogic classroom talk. I then re-coded the data for process (Charmaz, 2014; Strauss & Corbin, 1998) to focus attention on the talk-related practices and interactions that students and teachers engaged in over the course of the design work, as well as on the designing, redesigning, and reflection that the teachers and I engaged in over different cycles.

For the talk-related practices, I used deductive codes drawn from Nystrand's (1997) typology of classroom talk: "giving procedures/directions," "reading aloud," "giving a lecture," "engaging in recitation," "deliberating," and "engaging in dialogue." Following these initial coding cycles, I identified the patterns of teacher-student and student-student talk that emerged within iterative design cycles in both teachers' classes. For each design case, I then did a cross comparison of the talk patterns that emerged from each design cycle and coded for shifts in student participation and shifts in teacher participation across cycles.

### CHAPTER 3: FINDINGS FROM A NATIONAL SURVEY OF K-12 SUBTEXT TEACHER-USERS

This chapter presents findings from a nationwide survey (n = 451) of K-12 Subtext teacher-users. The findings address the research questions that informed survey data collection and analysis: How do Subtext teacher-users understand their uses, perceptions, and evaluations of Subtext, a tool with features that support digital talk (what I refer to as the interactive communication via signs and symbols that occurs in online spaces between two or more participants)? What do the teachers' responses tell us about digital talk in K-12 classrooms nationwide?

The analysis first describes participating teachers' reported reasons for using Subtext for reading and writing, their reported classroom uses of the app, and their reported understandings of Subtext as tool that encourages more student participation via digital talk. The second section reports on teachers' perceptions of affordances and constraints of Subtext, their sentiments related to Subtext, and the results of a co-occurrence analysis of perceived affordances/constraints and sentiments. For both sections, I consider what teachers' responses suggest about pedagogy and digital talk. I follow these analyses with a discussion of what the survey suggests about the overall state of digital talk in K-12 classrooms across the country.

#### Why Are You Using Subtext in Your Class for Reading?

Teachers were asked to select all applicable reasons for using Subtext with their students for reading from a list of six choices and/or add an additional response under "Other" (Figure 3.1). The top three reasons teachers reported were: to support close reading (84.7%, n = 381),

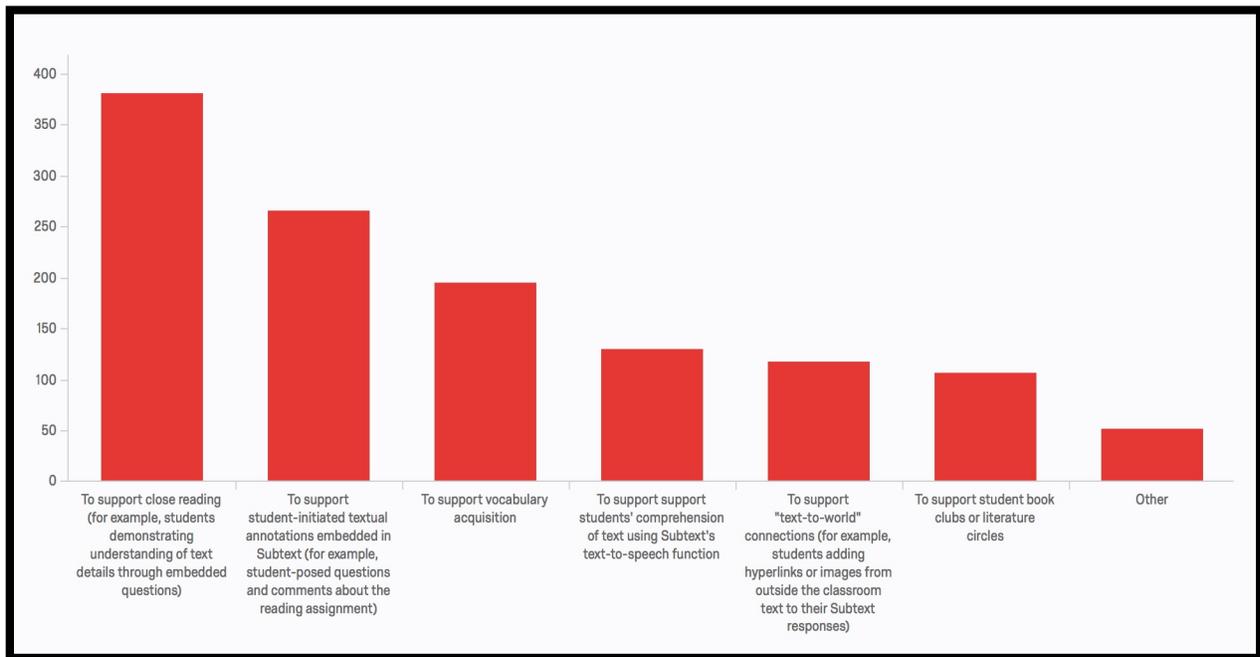


Figure 3.1: Frequency distribution of teachers' reported reasons for using Subtext for reading.

to support student-initiated textual annotations (58.9%, n = 265), and to support vocabulary acquisition (43.1%, n = 194). Twenty-nine percent (n = 130) of the participants identified Subtext's text-to-speech read-aloud function as a reason for using the app with their students, and 26% (n = 117) reported supporting text-to-world connections as a reason. The least popular of the provided reasons was to support student book clubs or literature clubs, with 24% (n = 106) of teachers selecting this choice. Additional reasons noted under "Other" (11.3%, n = 51) included increasing student access to materials (texts, embedded media); holding students accountable for reading assignments; encouraging technology use; fulfilling a district requirement; providing lesson planning assistance; supporting teacher-student interactions; and preparing for standardized tests. Comparisons across grade bands found very little difference among elementary, middle, and high school teachers' reasons for using Subtext for reading.

The selection of close reading by most teachers as the primary reason for using Subtext and the only reason for nearly 12% of the teachers (n = 44) suggests that teachers did not see the interactive and discursive affordances of Subtext as a central component to reading online. Subtext was marketed to teachers as an e-reader that supported embedded discussions and on-demand access to online resources that could help students look up information (e.g., Wikipedia and Google). However, the two reasons that would require students to use the app's networked capabilities--student book clubs and text-to-world connections--were the least selected of the provided reasons. This seems to indicate that teachers understood close reading via Subtext as a reader progressing through a single class text--a process similar to a student reading a paper text--rather than a reader using Subtext to interact with other readers and outside-class texts.

Over half of the teachers (58.9%, n = 265) viewed supporting student-initiated textual annotations as a significant reason for using Subtext, making it the second most commonly selected reason, although only 5% of the teachers selected student-initiated annotations as their sole reason for using Subtext. Based on my pre-study classroom observations of Subtext use, activities that fell under the categorization of "student textual annotation" included highlighting, posting comments about the text (usually following the teacher's instructions for commenting), and applying tags to sections of highlighted text (tags were usually decided by the teacher as well). Tagging also allowed students to search for and retrieve text excerpts for other assignments, such as essays.

The third most commonly selected reading-related reason was to support vocabulary acquisition (43.1%, n = 194). Subtext features an in-app tool that allows readers to instantly look up definitions of words. This tool can support vocabulary development through Subtext but seems unrelated to digital talk.

### **Why Are You Using Subtext in Your Class for Writing?**

Beyond reading, teachers were asked to identify their reasons for using Subtext with their students for writing.<sup>20</sup> They were asked to select all applicable classroom uses of Subtext for writing from a list of six choices and/or add an additional response under "Other" (Figure 3.2).

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<sup>20</sup> Twenty-two participants did not respond to this question; these missing responses were accounted for in the analysis.

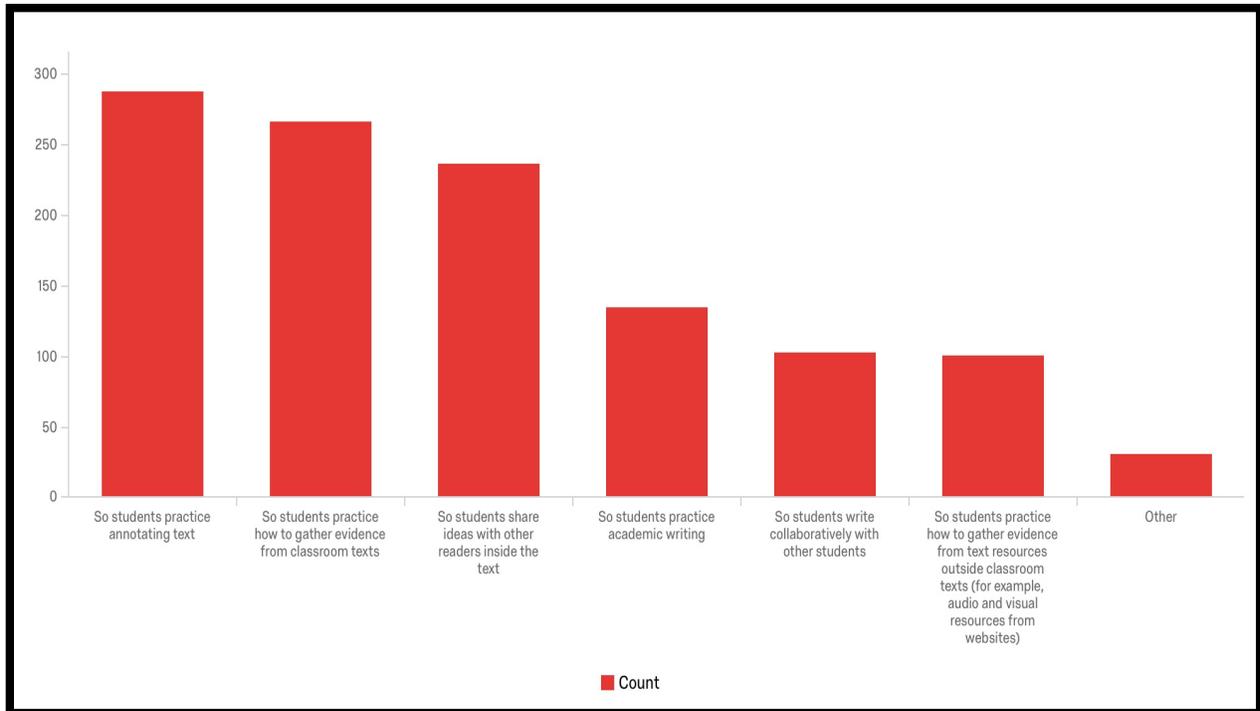


Figure 3.2: Frequency distribution of teachers' reported reasons for using Subtext for writing.

Teachers' top three reported reasons were: so students practice annotating text (68.6%,  $n = 288$ ); so students practice how to gather evidence from classroom texts (62.1%;  $n = 266$ ); and so students share ideas with other readers inside the text (55.1%;  $n = 236$ ). Thirty-one percent ( $n = 134$ ) of the participants selected academic writing practice as a reason for using the app with their students. Almost twenty-four percent (23.8%,  $n = 102$ ) identified supporting students' collaborative writing with other students as a reason, while 23.4% ( $n = 100$ ) selected using Subtext so students could gather evidence from outside of class texts as a reason, making these two the least popular of the provided reasons. The most common reason teachers noted under the "Other" category (7%,  $n = 30$ ) was that they did not use Subtext for writing (6.1%,  $n = 26$ ).

The popularity of text annotation (68.6%,  $n = 288$ ) and evidence collection (62.1%;  $n = 266$ ) suggests that many teachers perceived Subtext as a tool for "marking up the text" and identifying textual evidence to use in papers. That annotation and gathering evidence were the most common singly selected reasons for using Subtext for writing (over 11% of teachers selected evidence gathering as their only reason and 9% selected text annotation as their only reason) further suggests that these were significant writing-related reasons for using Subtext.

The third most popular reason indicates that 55.1% of the respondents ( $n = 236$ ) perceived student-to-student idea sharing as an important writing-related reason for using Subtext. Teachers' selection of this reason could suggest that they understood student-to-student written communication via digital talk as a generative learning resource.

## How Are You Using Subtext in Your Classroom?

Teachers were asked to select all applicable classroom uses of Subtext from a list of 12 choices (Figure 3.3).<sup>21</sup> The most common reported uses were: whole class reading (78%, n = 351); teacher-posed questions inside e-texts (77.1%, n = 347); individual students reading (65.1%, n = 293); small group reading (56.7%, n = 255); reading text outside of class time (53.5%, n = 240); and student-posed questions inside e-texts (47.4%, n = 213).

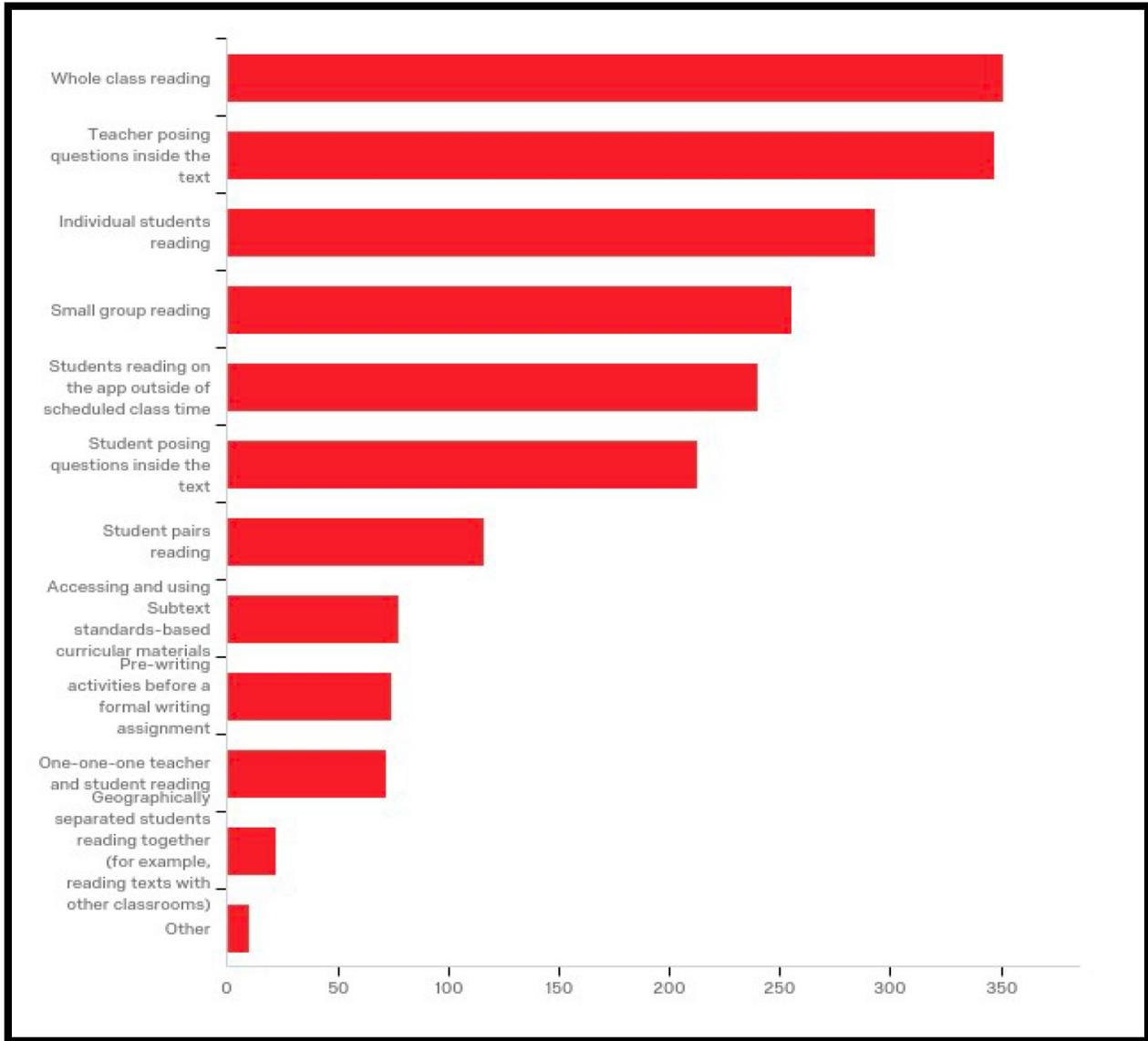


Figure 3.3: Frequency distribution of teachers' reported classroom uses of Subtext.

<sup>21</sup> As with the first two survey items, respondents had the option to note additional information in the "Other" textbox. One respondent skipped this question.

The least common uses of Subtext reported by teachers were: using the app to support students reading in pairs (25.8%, n = 116); accessing standards-based materials<sup>22</sup> (17.4%, n = 78); supporting pre-writing activities before a formal writing assignment (16.5%, n = 74), one-to-one student-teacher reading (16%, n = 72); and connecting geographically separated students in reading (4.9%, n = 22).

The most common reported use of the app, whole group reading, suggests that the majority of respondents used Subtext to assign readings of collective class texts. Additionally, whole group reading was selected as a reason over individual reading and small group reading (78% versus 65.1% and 56.7%). The popularity of whole group reading could mean that teachers used the app more often for a single assigned class text rather than for independent reading (e.g., Sustained Silent Reading) or for texts assigned to smaller reading groups.

The second most popular use of the app, teacher-posed questions in e-texts, suggest that many teachers used Subtext to guide their students through a text using embedded questions using the app functions that support digital talk/commenting. Over 77% of the respondents selected teacher-posed questions, versus 47.4% who selected student-posed questions. These data suggest that while students are offered opportunities to pose questions inside Subtext as they read, far fewer students pose questions than their teachers. A comparison of teachers' responses across grade levels revealed little difference in reported use of teacher-posed questions and student-posed questions.

A little over half of the respondents (53.5%) noted that their students used the app to read outside of class time, which indicates that these students own or rent iPads and therefore have the ability to engage in digital talk with their peers and teachers outside of scheduled class time (although we cannot tell from this how students actually used the app outside of class).

Additionally, teachers' responses suggest that Subtext is used very rarely to support digital talk interactions among geographically distant readers, even though the ability to have a networked reading experience regardless of time and space constraints is an affordance of the app.

### **Does Subtext Allow Students Who Do Not Normally Participate in Whole Group Discussions to Participate?**

Teachers were asked if they believed that students who did not regularly participate in the face-to-face class setting participated more via digital talk in Subtext.<sup>23</sup> Most teachers (82.6%, n = 371) said that they believed Subtext encouraged reticent students to talk inside e-texts. Fourteen and a half percent of teachers (n = 65) said Subtext might encourage more student participation, and 2.7% of teacher (n = 12) said they did not believe that Subtext allowed more opportunity to participate. A grade level comparison found a similar distribution of responses. These data suggest that teachers believed Subtext provides an alternate to the face-to-face learning environment that encourages different participation structures. Although participation in the digital space can take many forms, as the teacher design collaborations described in the following chapters demonstrate, the responses to this survey question suggest that the majority of

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<sup>22</sup> The premium Subtext subscription that became available in summer 2012 offered a range of curricular materials aligned with Common Core State Standards for the English Language Arts.

<sup>23</sup> One respondent skipped this question.

teachers understood the digital setting as different from “business as usual” in their classrooms (Figure 3.4).

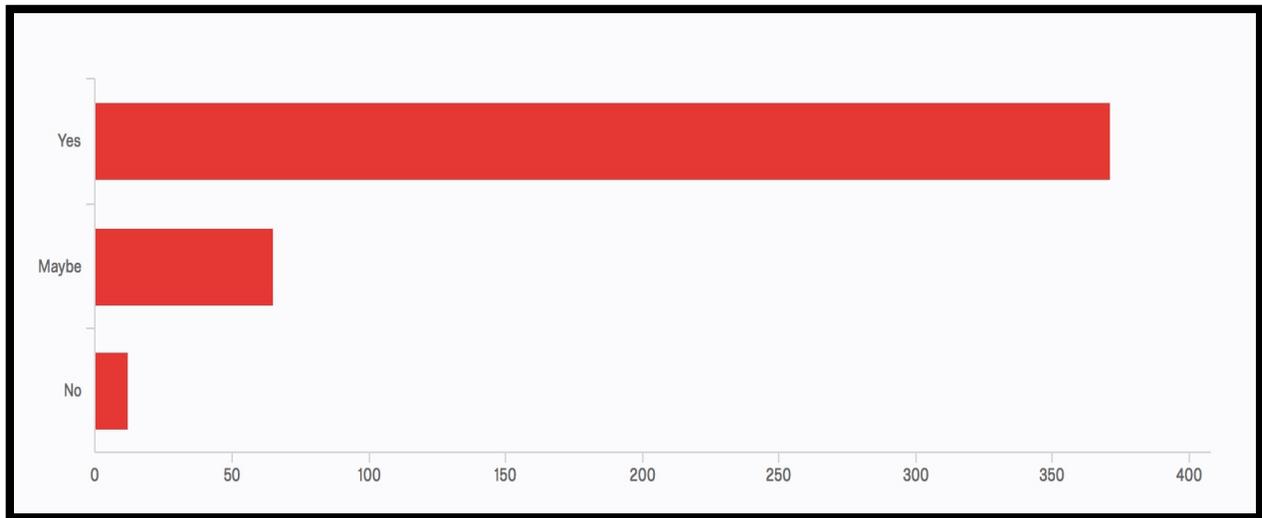


Figure 3.4: Frequency distribution of teachers’ views: “Subtext allows for students who do not normally participate in whole group discussion to participate.”

### Teachers’ Perceptions of Affordances and Constraints Related to Subtext Use

Teachers were asked to respond to the following open-ended question (Q6): How does using Subtext compare with using more conventional curricular tools and approaches? Content analysis of teachers’ responses (n = 401) suggested four major themes in teachers’ perceptions of tool affordances and constraints: Subtext as a tool that supports teachers’ purposes (56.9%, n = 228); Subtext as a tool that supports student-led learning activities (21.9%, n = 88); Subtext as tool that transforms learning due to its digital nature (29.4%, n = 118); and Subtext as a tool that hinders learning due to its digital nature (14.2%, n = 57).<sup>24</sup>

Teachers who described Subtext as a tool that supported teachers’ purposes often noted the convenience that the app afforded in terms of teacher productivity. For example, teachers said that using Subtext was more beneficial than conventional curricular tools because the app made “information easy to relay to students,” helped with “planning instructional sequences,” provided the ability to “differentiate reading assignments,” and made it possible “for teachers to curate specific articles quickly and create rich reading lessons.” Teachers also mentioned that convenient assessment of student activity was another significant affordance, some sharing that they “love that you can see if your students are interacting with the text” and “see student comments and get instant feedback on how well they understood parts of texts ... without collecting books.”

<sup>24</sup> Using simultaneous coding (Saldaña, 2009) allowed me to code responses for multiple ideas and topics. Frequencies provided reflect the nuances of many teachers’ responses, which I attempted capture with this coding technique.

Additionally, some teachers viewed the app as a modern solution to the age-old issue of keeping materials and students organized: “I love that kids always have their books and their homework with them. There are no longer excuses about lost books or lost assignments.” Or as one teacher put it, “Subtext is one stop shopping. I can get current materials specific to my curriculum and papers don’t get lost!”

Many respondents who viewed Subtext as a teacher tool shared that they found the ability to provide reading support inside of texts a major affordance of the app. Teachers noted that being able to “guide students’ reading of a given text, stopping them along the way to aid in their understanding,” was an important feature that was not possible with paper books. To these teachers, the app allowed them to use the annotation features (e.g., highlighter, tags, comments) to “model how a strong reader approaches a text” and “point out figurative language, creative word choice, connection to another text we read.” Teachers also reported the ability to communicate directly with students a key affordance of the app: “[Subtext] is superior [to conventional approaches to curricular materials] because of the ability to leave annotations within text from teacher to student and vice versa.” Teachers noted that their posts to students were “key to unlocking close reading and connections to texts [for students].”

Almost all the teachers who perceived Subtext as a tool that supports student-led learning activities mentioned the flexibility that the app provided and/or its ability to support digital talk among students. Teachers reported that enabling learning outside of the regular school day was an important affordance, noting that Subtext “lets students ask questions in real time no matter where they are” and is “great for interactivity and allowing students to work and collaborate outside of class.” Teachers also stated that Subtext changed class interactions because their students were “more engaged with each other about books” and “some shy kids have a platform to express ideas.” These perceptions of class interactions in Subtext as more interactive and collaborative echo teachers’ beliefs (Q4) that Subtext enabled changed talk participation among students.

In addition to these perceived affordances related to student-to-student digital talk, teachers noted that Subtext supported other student-initiated activities such as “build[ing] background knowledge through the use of links and hyperlinks” and reviewing “material at their own pace.” Teachers of students with language-based learning disabilities frequently reported the text-to-speech feature as an important tool that “allows students to be more independent and to access texts that are interesting to them but are above their independent decoding level.”

Another theme among teachers’ perceptions of affordances and constraints related to Subtext use was the belief that the digital nature of the tool improved learning. Teachers noted that they were teaching a “digital generation” that responded best to digitally mediated learning. “We need to be meeting digital learners and giving them curricular options that fit their learning styles,” one teacher observed. Another wrote, “Subtext makes learning more engaging for digital natives and more relevant to their real world ... as long as things are digital, students are more engaged.” Additionally, some teachers called Subtext a “game changer” that “brings an entirely new approach that is appealing to classics” and “provides an engaging reading experience that is not possible with a conventional textbook.”

Although many teachers reported viewing Subtext as a transformative tool, some other teachers held the opposite opinion. These teachers found Subtext a tool that hinders learning because of its digital nature. One teacher said that he “found Subtext frustrating and preferred reading from a regular book. The kids were so busy tapping and clicking during our literature

circle meetings that they missed a lot of what their classmates were saying.” Managing technical issues that hindered learning was a common thread in these teachers’ remarks. For example, teachers found purchasing and downloading books on Subtext “a very aggravating process that needs to be adjusted and a student-friendly process,” “annotations cumbersome and slow,” and the sharing/publishing of comments in e-texts unreliable.

Teachers’ responses suggest that while some teachers viewed student interaction via digital talk as a notable affordance, a more significant affordance for many teachers was the ability to embed teacher-initiated digital talk. Additionally, teachers’ perceptions of Subtext as a “game changer,” for better or for worse, suggest a belief that using Subtext--a tool that can support but does not guarantee productive interaction--leads to certain learning outcomes (either improving or impeding learning due to digital nature).

### Teachers’ Sentiments Related to Subtext Use and Code Co-occurrence Analysis

A sentiment analysis of teachers’ responses to Question 6 found that 74.8% of the teachers (n = 300) expressed positive sentiment about Subtext use, 15.5% (n = 62) expressed mixed feelings about Subtext use, 5% (n = 20) expressed negative sentiment about Subtext use, and 4.7% (n = 19) were unclear or undecided in their response. It bears mentioning that respondents who completed the survey may have felt more positively about using Subtext and that the sentiment data could reflect this bias. Table 3.1 provides examples of particularly common types of responses for each of the four identified categories.

Table 3.1: Sentiment code results for survey item #6 (“In your opinion, how does using Subtext compare with using more conventional curricular tools and approaches?”).

Sentiment code	Instances	Example survey responses
Positive sentiment	300/401	<ul style="list-style-type: none"> <li>• “Subtext is much easier to relay information to an entire group of students (I use it for multiple classes).”</li> <li>• “I had positive feedback from the students. They seemed to stay more engaged by answering embedded questions and liked the hyperlinks.”</li> <li>• “It helps students consolidate their work in one place as they work with other iPad apps (students often forget their paper copy). For students who struggle with reading independently, the text to speech feature allows them to hear the narrative and participate in homework and class discussions.”</li> </ul>
Negative sentiment	20/401	<ul style="list-style-type: none"> <li>• “I found Subtext frustrating and prefer reading from a regular book. The kids were so busy tapping and clicking during our literature circle meetings that they missed a lot of what their classmates were saying.”</li> <li>• “I thought it would be a method that students will</li> </ul>

		<p>like, but they don't seem to take the assignments seriously and rush through the assignments.”</p> <ul style="list-style-type: none"> <li>● “Unfortunately, there were too many glitches. They used it in lieu of a traditional paper copy of a packet of primary source documents. Annotating it was cumbersome and slow, so that when they highlighted, they'd lose their train of thought given all the steps it took. Some people tried to share comments and it didn't work; others never could turn off their sharing option. Some got my comments; others didn't.”</li> </ul>
Mixed sentiment	62/401	<ul style="list-style-type: none"> <li>● “love the annotation features but not a seamless operation; comments get lost, materials are inconsistently saved”</li> <li>● “It offers unique features and ease of accessibility, but does not necessarily offer anything innovative that strategies involving conventional books and writing tools cannot provide.”</li> <li>● “I like the premise of Subtext very much ... I feel that I needed more training to be comfortable with it and to use its full potential benefit for my students.”</li> </ul>
Uncertain	19/401	<ul style="list-style-type: none"> <li>● “I've only been able to use free texts, so my experience is limited.”</li> <li>● “It's not significantly different, besides the different kinds of prep (printing vs. setting up Subtext).”</li> <li>● “It both changes the way a student approaches a text, and yet it's not all that different.”</li> </ul>

As noted in the description of survey methods in Chapter 2, code associations or code co-occurrences can offer some insight about the context, or the activity system, within which people refer to the coded concepts (Contreras, 2011). For example, associations between teachers' perceptions of tool use (affordances and constraints) and their sentiments about tool use may reveal something about the ideologies that shape tool use in their particular contexts. Analysis of code associations for sentiments and perceptions of tool use revealed the following associations: positive sentiment and perception of Subtext as a teacher tool; positive sentiment and perception of Subtext as a tool that transforms learning due to its digital nature; positive sentiment and perception of Subtext as a student tool; mixed feelings and perception of Subtext as a tool that hinders learning due to its digital nature; negative sentiment and perception of Subtext as a tool that hinders learning.<sup>25</sup> Table 3.2 provides an overview of the code associations, the strength of the associations (c-coefficient), number of instances of code co-occurrence, and examples of data in which the codes co-occurred.

<sup>25</sup> Typically, the value of the c-coefficiency is between 0 and 1. The closer the number is to 1, the stronger the association.

Table 3.2: Code associations/occurrences between teachers' perceptions of tool use and teachers' sentiments about tool use.

Code associations and c-coefficient	# of co-occurring instances	Code co-occurrence examples
Positive sentiment + Perception of Subtext as a teacher tool  c-coefficient .68	210	"I like the variety of ways I can use the information, it allows me to differentiate my groups, and create small groups I can personally work with and scaffold."  "I find it invaluable for three things: quickly creating rich reading assignments, differentiating reading assignments, working with children who are geographically separate."
Positive sentiment + Perception of Subtext as a tool that transforms learning due to its digital nature  c-coefficient .55	87	"Children are: willing to write more in-depth responses; enjoy reading and responding to what other students write; totally engagement on the parts of all the students - no drifters; teacher becomes facilitator rather than leader."  "I love the embedded questions and links so that students can interact with the text. It helps students monitor their own learning because reading is more of an active process with Subtext."
Positive sentiment + Perception of Subtext as a student tool  c-coefficient .26	81	"Subtext allows every student the chance to be heard and to share ideas/comments/questions. Students can answer questions on their own time frame, rather than under the pressure of a classroom 'raise your hand' situation."  "Subtext improves comprehension. 1. Students are directed to focus on specific passages when answering embedded questions, which significantly helps their comprehension. 2. After answering an embedded question, students can see how others respond. This is valuable. They can compare their responses to those of their peers. If they answered very differently, they immediately know that they are off track and need to re-read the passage. 3. When reading about far-away settings, students can see images/video that I embed in the text in order to help them visualize how the setting

		impacts the plot. 4. Students can imbed their own images.”
Mixed sentiment + Perception of Subtext as a tool that hinders learning due to its digital nature  c-coefficient .48	36	<p>“Subtext has a lot of potential, but is a bit clunky right now and not as user-friendly as I would like it to be. My students and I have had to do a lot of figuring out, which has sometimes detracted from the experience and led back to using conventional tools and approaches.”</p> <p>“It is good in theory but getting free texts like PDFs, documents, etc is not possible. There aren't a lot of texts available for a varied group of students.”</p>
Negative sentiment + Perception of Subtext as a tool that hinders learning due to its digital nature  c-coefficient .19	11	<p>“I have not found Subtext to be that easy to use. I added students through Edmodo, then students put the code in and I had two lists. Next, the school administrator had to upgrade one list. Some students opted out of iPad use, and I have found things I want to assign, but the can't be uploaded to Subtext.”</p> <p>“Sometimes, it can be a little ‘buggy’ and this can interfere with homework. It can become an electronic ‘dog ate my homework excuse’ when students claim they posted a question or a response, but ‘it is not appearing.’”</p>

The co-occurrence analysis indicated a strong association (c-coefficient .68) between positive sentiment and perception of Subtext as a teacher tool that mediates teacher goals and productivity. This association suggests that positive views about Subtext are connected to the use of Subtext features that allow teachers to guide their students through texts, initiate communication with students, and plan and execute lesson plans. A weaker association (c-coefficient .26) existed between positive sentiment and perception of Subtext as a tool that mediates student-led learning. This relation suggests that positive feelings about Subtext are linked to uses of the app that support student-to-student digital talk and features that can help students in their close reading of texts (e.g., highlighting, multimedia links). These code associations reflect some of the patterns noted in the other survey item responses: teachers perceived the value of Subtext as a tool that could support student-initiated communication, but uses of the app that prioritized teacher-initiated talk seemed to be more prevalent than student-initiated talk.

The strong association (c-coefficient .55) between positive sentiment and perception of Subtext as a tool that transforms learning suggests that assumptions related to tool agency and teaching a “digital generation” may inform teachers’ adoption of and practices with Subtext. If teachers believe that transformed learning (more interactive, more engaged, more substantive) is

a guaranteed outcome of digital tool use, it is possible that what it means to create conditions for consequential uses of Subtext often goes unexamined since the tool “makes” learning happen.

The analysis found a stronger association between mixed sentiment and perception of Subtext as a tool that hinders learning (c-coefficient .48) than between negative sentiment and perception of Subtext as a tool that hinders learning (c-coefficient .19). A common theme across almost all mixed and negative sentiment responses, however, was that technical difficulties with Subtext slowed or halted students’ learning. The relation between the perception of the digital medium as a learning obstacle and mixed or negative feelings suggests that reliability is a critical factor for teachers when it comes to using digital innovations with their students. Even those teachers who expressed appreciation for the communicative affordances of Subtext ultimately framed it as a tool that they could not use in their classroom due to technical unreliability.

### **What Does the Survey Tell Us About Digital Talk in K-12 Classrooms Nationwide?**

Survey findings suggest that digital talk practices in Subtext vary in K-12 classrooms and can be used to organize monologic and dialogic learning opportunities.<sup>26</sup> However, the prevalent use of the app’s discussion functions appeared to be for teacher-initiated comments and teacher-initiated digital talk. Teachers perceived student-initiated questions in Subtext as a significant reason overall for using the app, but the reported uses of the app indicated that student question-posing occurred with far less regularity than teacher question-posing.

The data also indicate that digital talk often functions as a “teacher tool” that allows teachers to disseminate information and to provide guidance to students through embedded questions and/or comments. The high percentage of teachers across grade levels who reported using teacher-posed questions suggests that Subtext teacher-users are knowledgeable about the app’s discussion capabilities, but the lower percentage of teachers who use the discussion features for student-posed questions points to the primary role of digital talk in many classrooms as a tool that most often serves teachers’ purposes.

These findings are supported by the results of the code co-occurrence analysis. The code associations indicated that teachers viewed and valued Subtext first as a tool that mediates teacher goals and productivity and second as a tool that mediates student-led learning. These associations suggested that many teacher-users prioritized posting “reading guides,” initiating questions, and teacher-student communication over student-led learning activities such as student-initiated questioning, self-paced reading, and student-to-student interactions. Additionally, the notable association between mixed feelings and the perception of Subtext as a tool that hinders learning is unexpected and interesting. The co-occurring data indicated that even when some teachers saw the potential of using the app to support in-text interactions, they ultimately viewed the app as an unsustainable classroom tool due to the technical risks involved. This finding raises questions about the array of supports, both technical and pedagogical, that teachers need to integrate Subtext and, by extension, digital talk opportunities into everyday class life.

Despite the dominance of teacher-initiated digital talk that the survey responses suggest,

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<sup>26</sup> As noted earlier, with monologic approaches the primary goal is for the learner to acquire the information that the teacher views as relevant, and with dialogic approaches the goal is for the learner to develop knowledge in dialogue with the teacher and classmates.

the majority of respondents reported that they viewed Subtext as an inclusive tool that provided a “talk friendly” space for students, particularly for students who do not participate in face-to-face classroom talk. The teachers’ perceptions demonstrate a belief that the digital medium offers a different kind of interactional space with alternate rules that serve to support student voice. This apparent disconnect between perception and enactment is striking, because it indicates that the majority of teachers value “social reading” (and have undertaken the involved and expensive process of bringing an app that can support social reading into their classes) but are having difficulty achieving dialogically organized social reading that invites student-initiated digital talk.

The survey offers a bird’s-eye view of how K-12 teachers across the nation understand and use a digital tool with digital talk affordances. The findings highlight some patterns in teachers’ perceptions of and practices related to digital talk as a learning tool, and they also make visible possible tensions between teachers’ understandings of Subtext as a tool that supports student voice and teachers’ actual implementation of the tool. These data also help to contextualize the findings from the design experiments in the following chapters. These two chapters, which focus on teacher-researcher design collaborations in an elementary school classroom and a high school classroom, illustrate what some of the patterns and tensions identified at the national level can look like “on the ground” when teachers and students are endeavoring to learn through digital talk.

## **CHAPTER 4: TALKING TO LEARN ACROSS FACE-TO-FACE AND DIGITAL SETTINGS IN AN ELEMENTARY SCHOOL CLASSROOM**

This chapter presents findings from my design collaboration with Lisa, an elementary school teacher in a combined fourth- and fifth-grade class. The results of our work together help address the following research questions: What kinds of learning opportunities are mediated by digital talk (the interactive communication via signs and symbols that occurs in online spaces between two or more participants) in an elementary school classroom? What is involved in designing learning that is organized to support dialogic digital talk (digital talk that features teachers and students collectively building on each other's ideas and reciprocally sharing ideas in response to and anticipation of other ideas)? Over the course of four iterative design and reflection cycles, the following "humble theories" (Cobb et al., 2003) emerged about digital talk that supports the learning of disciplinary knowledge:

- Student-to-student digital talk can help mediate more sophisticated understandings of disciplinary knowledge (e.g., in literature, the concept of "theme") if a teacher organizes learning in ways that establish a strong conceptual foundation and explicit interactional expectations.
- Digital talk can afford a more transparent tracking of students' developing conceptual understandings, helping teachers make more accurate adjustments aligned with learning needs.

I share in what follows the analyses that helped shape these working theories. I begin with pre-design talk practices related to reading fiction and nonfiction texts in the face-to-face (classroom) and digital (Subtext) learning settings that Lisa and her students traversed. Although talk in the face-to-face setting shifts the focus away from digital talk as the centerpiece, examining talk in both face-to-face and digital activity systems provides a window into the broader, everyday ecology in which different talk tools mediated learning for the fourth and fifth graders. Additionally, these different forms of class talk provide a baseline by which to understand changes related to our design cycles.

The analysis revealed that pre-design face-to-face and digital talk in Lisa's classroom was often, but not always, organized in ways that positioned Lisa as the gatekeeper of talk. Students spent much of their face-to-face talk time in comprehension talk with Lisa rather than in dialogue about textual interpretations with their teacher and classmates. Similarly, talk in the digital activity system seemed to engage students in broad, disconnected participation patterns of direct response to Lisa, aside from some notable exceptions of "rogue" student-directed interactions (e.g., student-posed questions and unclinking digital talk). These interactional practices contradicted the broader goals that Lisa brought to her teaching of foregrounding student-led meaning making and peer interaction. These kinds of interactions highlight the challenge of striking a balance between encouraging participation from all students and designing for meaningful dialogue in and across digital and face-to-face learning environments.

Following analyses of talk in the two systems, I turn to a qualitative retrospective analysis of my design research collaboration with Lisa, describing our iterative cycles as we

worked to help students acquire conceptual knowledge about themes in poems through digital talk.

### Phase 1: Classroom Talk Interactions

#### Talk about Texts in the 4th/5th Grade Face-to-face Activity System

Viewing talk as “a way for students to take ownership of their learning and to share [their learning],” Lisa intentionally incorporated various talk strategies as students read texts, including read-aloud, whole-group discussion, and pair-share (i.e., student turning to a partner to discuss an idea before sharing with the rest of the class). The most common talk practice in Lisa’s class was the read-aloud. During these sessions, Lisa would identify a learning objective for the class to focus on as she read a text to the class, and she would periodically stop as she read to provide commentary and pose questions.<sup>27</sup> Although students had ample opportunities to speak during read-alouds and did so enthusiastically, talk patterns suggested that they were rarely presented with opportunities to share textual interpretations or engage in extended ways with their peers about the text. The lack of these kinds of opportunities contradicted the broader goals that Lisa had of foregrounding student-led meaning making and peer interaction. As other research has shown, it remains challenging for even committed teachers like Lisa to create classrooms that center on student-led meaning making. I provide in what follows some representative excerpts that illustrate how these interactions unfolded.

This first example (Excerpt 4.1), which I observed during my initial Phase 1 visit to Lisa’s class, came from a read-aloud from the novel *The Fourteenth Goldfish* by children’s author Jennifer Holm. The questions Lisa posed during this read-aloud elicited broad participation from students, but students were not asked to go in-depth with their ideas or in their interactions with each other.

Excerpt 4.1: Whole-class read-aloud for *The Fourteenth Goldfish*.

1	Lisa (L)	In our read-alouds and in our small groups that we have been
2		talking about details. Details don’t have to be a full sentence.
3		Sometimes they're capturing one or two words and still telling
4		us something really important. And today as I'm reading
5		aloud, we’re focusing on the details. [She reads aloud and
6		students listen and follow along quietly]
7	L	[Pauses and looks at students] Does anybody know what this
8		might mean: “Rome is going to fall”? [The character in the
9		book says, "Rome is going to fall again before we're ready"]
10	Students	Oooh!! [raising hands]

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<sup>27</sup> At the start of a typical read-aloud, Lisa instructed students to come to the front of the classroom and get in a comfortable position to follow along with the text. Students could read along on Subtext or on the projector screen (Lisa read from her iPad and mirrored Subtext on the screen), or just focus on listening to Lisa.

11 L You want to try it? [to Matvey, who has his hand raised]  
 12 Matvey I think [pause]. You know, like, there was a volcano.  
 13 L There was--  
 14 Nicky [interrupting] That was Pompeii!  
 15 L Pompeii. But close in the same country. Rome is a city by  
 16 there. Theo?  
 17 Theo Well, the Rome empire, it fell after a very long period of time,  
 18 so he's using that one period of time and using it as a time  
 19 length for how long it's going to take them.  
 20 L So is he wanting them to go sooner or later?  
 21 Students Sooner!  
 22 L So the author added that connection to this to help show how  
 23 much sooner.

Lisa began by reminding the class that details can tell readers “something really important.” She directed students to focus on details during this read-aloud, noting that they already had experience working with details during small reading groups and other read-alouds. After reading from the novel for a few minutes, she stopped after the line “Rome is going to fall again before we’re ready” and asked if anyone knew the meaning of the phrase “Rome is going to fall.” Matvey was selected to share his response, and he offered an idea that he appeared to be formulating as he spoke; he started with “I think” and then paused for a moment before he tried again: “You know, like, there was a volcano” (line 12). It seemed that Lisa started to repeat Matvey’s words (line 13) but was interrupted by Nicky, who jumped into the conversation with a response, and perhaps a rebuke, to Matvey: “That was Pompeii!” (line 14). Nicky believed that Matvey was referring to the ancient Roman city that was buried by a catastrophic volcano,<sup>28</sup> and his words and tone suggested that he was challenging Matvey for confusing Pompeii and Rome. Lisa defused the situation by acknowledging both speakers’ ideas (lines 15-16) and offering a possible reason for Matvey’s apparent mix-up (“But close in the same country. Rome is a city by there.”). She then called on Theo, who offered his ideas about the meaning of “Rome is going to fall” (lines 17-18).

This smoothing over of a potentially tense student interaction was skillful, and Theo’s reply was thoughtful. However, it could be argued that an opportunity for talking to learn was lost in this successful transition. For example, why did Matvey bring up a volcano, and how did that tie into his understanding of the phrase Lisa asked about? The assumption both Nicky and Lisa made was that Matvey’s idea was about Pompeii and, therefore, was not viably related to Lisa’s question. What Matvey was actually trying to articulate, however, remains unknown. Had he been given the chance to continue or elaborate, it is possible that his exploratory talk could have helped clarify his textual connection and/or opened space for more of his classmates to collaboratively think aloud in response. Rather than using Matvey’s comment as a building block to move the conversation forward, Lisa called on Theo. Matvey did not have a chance to re-enter the conversation, and that particular talk direction was terminated when Lisa posed a known

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<sup>28</sup> I later found out that the students had learned about Pompeii in class, which might explain why Nicky connected to Matvey’s comment in this manner.

answer question to the entire class (“So is he wanting them to go sooner or later?”) and summed up how the students should understand the phrase in relation to the narrator’s intentions (“So the author added that connection to this to help show how much sooner.”).

Given her espousal of dialogic teaching, it is no surprise that Lisa designed her read-alouds so that students had ample opportunities to participate as they read/listened. However, as this next example from the same read-aloud shows (Excerpt 4.2), these talk opportunities rarely called on students to provide their textual interpretations or to engage in in-depth idea exploration. Further, talk was organized so that participation occurred across students rather than between students, meaning that while many students had opportunities to speak, their responses targeted Lisa’s questions rather than the ideas of their peers.

Excerpt 4.2: Whole-class read-aloud for *The Fourteenth Goldfish*.

1	L	Pay attention to the details in this particular house. [She reads
2		a paragraph filled with details about the home interior,
3		including a description of scattered periodicals, and pauses]
4	L	What is another word for periodicals? Or what does that even
5		mean, “periodicals”? Anybody have a guess? [Several
6		students raise their hands] Amaya?
7	Amaya	They’re like the elements of the periodic table?
8	L	Ok, so you know periodic table from how to organize the
9		science elements. Anyone else have ideas of what a periodical
10		is? [two-second pause; no hands raised] It’s anything that is a
11		published work, like newspapers, magazines. [Continues to
12		read; pauses after reading a sentence that describes a rolltop
13		desk] Anyone know what a rolltop desk is? [two-second
14		pause] It’s really cool, we don’t see too many of them these
15		days.
16	Dallas	It’s a desk that has a lid.
17	L	Yes, yes. It looks a little different [goes to whiteboard and
18		sketches a rolltop desk; several students say they are familiar
19		with these desks]. What other details do you see? Noah?
20	Noah	Dressers?
21	L	Ok, the dressers. Any others?
22	Allie	Soy sauce packets in the jar.
23	L	Ok, the soy sauce packets. [Continues reading]

In this excerpt from the same read-aloud, Lisa drew students’ attention once more to the learning objective of noticing details. After reading a paragraph describing the interior of a home, Lisa stopped and asked students if “anyone [had] a guess” about the meaning of “periodicals.” Amaya, recognizing the word “periodic,” offered her guess that the word referred to chemical elements (line 7). Lisa acknowledged Amaya’s idea (“You know periodic table from how to organize the science elements”) and then asked if others had additional thoughts. While Lisa did not explicitly evaluate Amaya’s suggestion, her response suggested that there was another preferred meaning. Interestingly, there were no volunteers when Lisa asked the second

time around, which could indicate that other students shared Allie’s understanding of periodicals and surmised from Lisa’s request for additional ideas that this was the incorrect meaning. Seeing no hands raised, Lisa provided the definition and continued reading.

After a few more lines, Lisa paused again to ask students if they were familiar with rolltop desks. Dallas called out, “It’s a desk with a lid,” a response that Lisa validated (“Yes, yes. It looks a little different.”). She then moved on to ask students to share additional details that they notice in the text, first calling on Noah, who supplied “dressers,” and then Allie, who volunteered “soy sauce packets” (lines 20-22). Lisa repeated their words and then resumed reading. These exchanges featured broad participation; four different students contributed to the conversation about textual details. Wide participation is not easily achieved in classrooms (Juzwik et al., 2013; Nystrand, 1997), and the many different student voices represented in this brief span of time suggested that the community members understood that student contributions were expected and valued in the face-to-face activity system. However, the talk was organized in ways that precluded idea exploration. Contrary to the learning objective Lisa shared at the beginning of the read-aloud, the interactions did not build conversation around how details “are telling us something really important.” Lisa’s questions invited participation (“Anyone have a guess?” “Any others?”), but they were not structured to engage students in deeper analysis of textual details or in conversation with classmates. Rather, they seemed to act as sentence-level checks of lexical comprehension and understandings of facts, which were then evaluated explicitly (“Yes, yes.”) or in more subtle ways (“Anyone else have ideas of what a periodical is?”). In other words, these interactions revealed recitation talk patterns, where the teacher initiates questions, students respond to those questions, and teachers evaluate students’ answers (the IRE sequence) (Mehan, 1979). While the question types we see here may be appropriate for certain pedagogical goals (e.g., evaluating foundational reading comprehension skills), their prevalence in read-alouds clashed with Lisa’s intention of creating a space for exploratory student thinking and talk. Because guided read-aloud was the dominant method for talking about texts in the class, students spent much of their face-to-face talk time in comprehension talk with Lisa rather than in dialogue about textual interpretations with their teacher and classmates. These kinds of interactions highlight the challenge of striking a balance between encouraging participation from all students and designing for meaningful dialogue.

### **Talk about Texts in the 4th/5th Grade Digital Activity System**

Analysis showed that students spent much of their face-to-face talk time in comprehension talk with Lisa rather than in dialogue about textual interpretations with their teacher and classmates. Similarly, talk in the digital activity system often seemed to engage students in broad, disconnected participation patterns of direct response to Lisa. Analysis of pre-design digital talk (89 digital talk threads from two novels, four short stories, and 16 non-fiction articles) indicated that the most common digital talk interactions centered around teacher-guided reading, where Lisa modeled reading strategies in a text and provided students opportunities to practice strategies, and teacher-posed open-ended questions that asked students to provide interpretations of text. The following example from the novel *A Long Walk to Water* by Linda Sue Park illustrates typical digital talk practices during guided readings in Subtext.

As Lisa shared during our interview, she appreciated that Subtext commenting tools allowed her to act as a “thinking guide” through a text. She organized guiding remarks into

categories such as Again and Again (focusing on repetition in a text and its purpose), Memory Moment (focusing on how characters' memories help shape the reader's understandings), A-ha Moments (focusing on when an author shows a character making a discovery), and Tough Questions (focusing on difficult questions a character is considering). The following example (Excerpt 4.3) presents posts that Lisa embedded to guide thinking about Tough Questions in *A Long Walk to Water* as well as the resulting digital talk.

Excerpt 4.3: Examples of Lisa's Tough Questions guided reading posts in a *Long Walk to Water*.

Let's stop here because there are several Tough Questions: "Where are we going? Where is my family? When will I see them again?" For an 11 year old boy, these are obviously painful questions. When an author shows me the difficult questions that a character is considering, I want to stop and think about those questions. They show me the conflicts—the problems—that character is worried about. I want to ask myself, **WHAT DO THESE QUESTIONS MAKE ME WONDER ABOUT?** As I think about Salva's difficult questions and ask myself what they make me wonder about, I wonder if I could have survived without knowing where my family was or even if they were still alive. I have to wonder, too, how the people he is with will react. They are in desperate circumstances, too, so I wonder if they'll help or if they'll just ignore this small child. They're trying to escape, too, and might see Salva as nothing more than another burden. They might just turn their backs on him. Most of all, I wonder what he's going to have to do to survive.

Let's read on. We're skipping ahead in the story to a point where Salva, who has been on his own for a while, finds a small group of people who are trying to survive.

Taking the time to think about the Tough Question helps us put ourselves in the story, visualize what's happening, and imagine how the character are feeling. If we do that, we'll better understand what Salva is going through.

The Tough Question is "Would he have given water to those men? Or would he, like most of the group, have kept his water for himself?" When you spot such a question in any text, ask yourself, "What does this make me wonder about?" How would you answer this?

Lisa always identified a specific "thinker's angle" before modeling her process of engaging with the text. In the first guiding post, she stopped the reader to focus on some difficult questions facing a character and to consider "What do these questions make me wonder about?" She then walked the reader through her own questioning process: "As I think about Salva's difficult questions and ask myself what they make me wonder about, I wonder ..." This post and the two following did not invite comments or questions from students; teacher talk served to communicate a metacognitive process and to direct the reader to a different section of the novel and preview that section.

It was not until Lisa's fourth post that the reader was asked to address a set of Tough Questions: "Would he have given water to those men? Or would he, like most of the group, have

kept his water for himself? How would you answer this?” In answering these open-ended questions, students were expected to practice and display metacognitive strategies and demonstrate “[putting themselves] in the story.” Excerpt 4.4 shows almost all the students directly responding to at least one of the Tough Question Lisa posed. Some students predicted

Excerpt 4.4: Digital talk excerpt from *A Long Walk to Water*.

- |    |             |  |
|----|-------------|--|
| 1  | Savannah    | I think he would give the water to the dead men.               |
| 2  | Nolan       | Kept it for myself because he is so little to die.             |
| 3  | Hailee      | I would giving water to those men. Instead of keeping it for   |
| 4  |             | my self.   |
| 5  | Zach J      | I think that he will give some of the water to the men and     |
| 6  |             | some for him because he needs to survive.                      |
| 7  | Theo        | I would give my water to the men because they will need the    |
| 8  |             | water to hunt for food for the group.                          |
| 9  | <b>Ryan</b> | <b>Who is he talking to</b>                                    |
| 10 | Amaya       | This makes me wonder if he would choose to be kind, or         |
| 11 |             | maybe just try and keep himself alive.                         |
| 12 | Kyla        | It makes me wonder why he thought he meh not share the         |
| 13 |             | water.   |
| 14 | Jaslyn      | If he gave the water to the men would he have enough water     |
| 15 |             | for himself?   |
| 16 | Reese       | I would not I would want to survive. I wonder if he din not    |
| 17 |             | think that he would maybe he will think he is a bad person.    |
| 18 | Tanner      | It makes me wonder if I would have kept it so that I would not |
| 19 |             | die.   |
| 20 | Matvey      | What will they do now that people are dying. Will they make    |
| 21 |             | it.  |
| 22 | Nicky       | I think he would of gave some water to those men instead of    |
| 23 |             | the rest of the group would of been greedy. I think he would   |
| 24 |             | because he didn't want to see them die.                        |
| 25 | Hayden      | I think he probably will give a little bit of water to them.   |
| 26 | Kendall     | He would've given some of his water                            |
| 27 | <b>Ryan</b> | <b>Him self or someone else?</b>                               |
| 28 | Donny       | I wonder why those men needed water. I also wonder why did     |
| 29 |             | his group not give those men water.                            |
| 30 | Wilhelmina  | I think it depends. He is having this experience, so he knows  |
| 31 |             | how it feels. If had not had this experience, he probably      |
| 32 |             | wouldn't want to give his water away.                          |
| 33 | Alli        | It makes me wonder if something similar to the thing that      |
| 34 |             | happened to the five men would happen to the rest of the       |
| 35 |             | group. Him thinking that makes me think really, would he? Or   |
| 36 |             | would he not.  |
| 37 | Kaden       | I think he will share his water                                |
| 38 | Sophia      | I would have saved some for me. But I would have also given    |

39		some to the men. But it is a hard ? To answer. Especially if I
40		was in his shoes.
41	Ruben	It makes me wonder if Salva really knows who he is. Whether
42		he had decided or not, if he understands himself.
43	Lukas	I think he will share
44	<b>Ryan</b>	<b>I would of giving my water to the men</b>
45	<b>Theo</b>	<b>Him self.</b>
46	Zach R	I think this means he would be careing or not.

how the character Salva would act (lines 1, 5-6), some shared how they would act in Salva’s place (lines 7-8), and some shared what the text made them wonder (lines 28-29). There was, however, a conspicuous exception. Amid this volley of teacher-directed responses, Ryan’s posts stood out because they were serving a different purpose: his own. Seemingly unsure about who Salva was addressing, he first asked for clarification: “Who is he talking to?” (line 9). When he did not receive a response from his peers, he again tried to flag down help, this time specifying his point of confusion: “Him self or someone else?” (line 27). Although Theo appeared to respond to Ryan (suggested by the fact that Theo wrote “Him self,” using Ryan’s spelling of the same word, well after responding to the Tough Questions, line 45), his answer did not arrive in time to help Ryan formulate a response about Salva’s actions. Failing to engage his peers, Ryan instead chose to respond to the third Tough Question, which asked what the reader would do in Salva’s place: “I would of giving my water to the men” (line 44). Ryan modified the rules of guided reading digital talk by posing his own questions, but his rule-bending talk—his playful reimagining of social norms (Vygotsky, 1978)—did not recruit the interaction he needed to expand his understanding of the text. The fact that only Theo responded to Ryan’s multiple attempts to engage other voices suggests that the social organization of digital talk practices validated one question-poser, Lisa. Digital participant structures seemed to mirror in-person participant structures, indicating that the students had been socialized into particular ways of reading and interacting in the classroom.

Guided reading was a strategy most often used for longer texts such as novels and novel excerpts. For short stories and newspaper and magazine articles, Lisa (Mrs. G.) typically embedded open-ended or authentic questions that asked students about their textual interpretations, their opinions about issues taken up in the readings, and the ways in which the readings might connect to their life experiences. However, as this next example (Excerpt 4.5) shows, invitations to share interpretations did not change the prevalence of recitation-like interactional patterns.

Excerpt 4.5: Digital talk excerpt from article, “Scientists Create a Ring that can Read to the Blind in Real Time.”

1	Mrs. G	What do you think this means? [referring to a highlighted
2		quotation: "Any tool that we can get that gives us better
3		access to printed material helps us to live fuller, richer, more
4		productive lives."]
5	Wilhelmina	I think it means that this is an excellent tool to help the blind
6		read. I would agree with that.

7	Sophia	I think it means that the blind need better life's. A specially
8		since they are blind.
9	Hailee	I think it means you should be happy to make other people
10		happy
11	Alli	I think that it means that they will take all that they could get.
12		And they could figure out a work around.
13	Jason	It means that anything that will help will make the peoples
14		lives much more richer and fuller. People will have much
15		better live with this tool.
16	Matvey	Later in the future it wouldn't take as long to do something.
17		Also you can enjoy the things you like to do more.
18	Theo	It means that it is taking away part of the disability. Like you
19		blind with it you can't see the sidewalk in front of you but you
20		can read the news and things like that.
21	Jaslyn	If you get something that is very useful, you can live a better
22		life?
23	Reese	I'm not exactly sure. Here's what I think, it means if people
24		can read they will be happier and smarter.
25	Hayden	It is kind of the next big thing?
26	Kyla	I think it means that if it was easier to read people would live
27		a happier life. I also think it means that if you can read you'll
28		be happier.
29	Kendall	That they would live better lives
30	Noah	It helps the blind read.
31	Ruben	That anything that can help people with disabilities can make
32		the world a better place, for everyone. I think that when there
33		done with this, they would have moved on to flying cars, and
34		communicators to animals. And by the way, they already are
35		making flying cars in Germany.
36	Amaya	I think it means that tools to help people, make the world a
37		better place.
38	Nicky	It's going to be the next big thing. Also it's going to help
39		people read.
40	Allie	I think it maybe means any tool that can work or help the
41		finger reader makes the world a better place. It could also
42		mean any tool that can work or help the finger reader makes
43		the maker richer.

Lisa asked students to consider in this discussion thread an interviewee's comment in the article "Scientists Create a Ring that can Read to the Blind in Real Time." At a glance, the resulting student talk appeared quite robust. Several posts were at least two sentences long, and the students offered a wide variety of relevant, thoughtful interpretations. Ruben, for example, connected his understanding of the interviewee's words to other potentially transformative inventions such as flying cars (lines 31-35), while Amaya suggests a connection between improved tools and social progress (line 36-37). However, focusing on the interactional

pathways in this lively thread suggests that students are “industriously isolated” in broad, disconnected participation patterns. Engaging in digital talk allowed multiple students to respond to the same question and share their perspectives (in contrast to the common one question-one answer interaction in face-to-face settings that), but their posts linked only to Lisa’s question. The students could view their classmates’ responses, but there was no indication that they were interacting with their classmates’ words in the digital space.<sup>29</sup>

In our early conversations, Lisa acknowledged the predominance of these teacher-student digital talk patterns, and she expressed strong interest in supporting more interactions between students in Subtext that “leverage[d] the knowledge that everyone has.” However, Lisa’s use of certain Subtext discussion functions sometimes organized talk in the digital setting in ways that contradicted her stated goal of interactive and collaborative learning. In particular, Lisa’s periodic use of the Subtext “cloaking” feature pointed to a disconnect between intention and implementation. Cloaking is an optional feature that allows teachers to hide available comments until a student has posted to a discussion. Lisa explained that cloaking was helpful because it gave her an initial first look at “[students’] ideas, thoughts, and reactions” before seeing what their classmates had posted. Her positive view of this feature was not uncommon; many other Subtext-using teachers that I spoke with before and during Phase 1 shared her opinion that it was a helpful way to ensure that students were posting original thoughts and reactions. However, the use of cloaking--which is designed to prevent student interaction--undermined her explicit goal of organizing interactive learning talk among her students.

It seems that use of the cloaking feature was meant to uphold the kinds of rules and divisions of labor around classroom digital interaction that data in this chapter have suggested: teacher as question-initiator and evaluator and student as respondent. What I therefore found remarkable as I was looking through cloaked talk threads was how some students in Lisa’s class circumvented the cloaking constraints and found ways to interact with their classmates. In my examinations of 32 cloaked digital talk threads, I noticed 18 instances of students “gaming” the system to see their classmates’ posts before responding to Lisa’s question. These students would provide a non-committal response that “unlocked” their classmates posts and allowed them to then view what their classmates had written. I provide two examples here that show what these playful moments looked like and to consider what this rule-bending suggests about digital talk as a learning tool.

In this first example (Excerpt 4.6), Lisa (Mrs. G.) posed an open-ended question in the story “The Legend of the Black Sea.” Although the students were expected to share their ideas about the character without interacting with their classmates, two students, Jason and Kendall, managed to interact with their classmates despite the restrictions their teacher placed on posting.

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<sup>29</sup> This is not to say that students were not interacting while they were posting. I observed plenty of interaction between students in the face-to-face setting as they “ignored” each other in a digital talk thread, which suggests that they perceived different rules operating around different types of talk in different talk spaces (e.g., “Digital talk about an article in Subtext means that I answer the teacher, but I can talk to my three table partners while I’m answering the teacher.”). Some of this face-to-face student talk I observed related to their reading assignments, but most was unrelated to the class text (e.g., joking, other class assignments).

Excerpt 4.6: Digital talk excerpt from short story, “The Legend of the Black Sea.”

1	Mrs. G.	What does this tell us about the old man character?
2	<b>Wilhelmina</b>	<b>He is getting frustrated because he can't catch fish. He is going to wait for while.</b>
3		
4	Nolan	He gave up on it.
5	Jaslyn	He really likes his net and he isn't giving up.
6	<b>Amaya</b>	<b>This tells me that he is not very persistent, and gives up easily.</b>
7		
8	<b>Jason</b>	<b>K</b>
9	Donny	That he is mad at the cat and he does not like black cats any more because he thinks they are all evil.
10		
11	<b>Jason</b>	<b>This tells me he isn't very persistent. It also show evidence that the man will get really frustrated if he can't get food.</b>
12		
13	Noah	That the man does not want to throw the net into the water anymore.
14		
15	Kat	He is a fisher and always does it. It also tells us that he gives up on thing very fast and can't believe it well be in normal condition again.
16		
17		
18	<b>Matvey</b>	<b>He had given up. He was hopeless.</b>
19	<b>Henry</b>	<b>He lost hope because there is no fish.</b> He doesn't want to do it because the sea is empty
20		
21	<b>Allie</b>	<b>It tells us that he has lost faith and hope.</b> I think that he should not have given up hope.
22		
23	<b>Kendall</b>	<b>m</b>
24	Alli S	It tells me that he gave up trying to catch fish because he thinks that he will not find any more fish and have to starve.
25		
26	Zach J	That he has given up and does not want to fish.
27	<b>Kendall</b>	<b>He was giving up hope of catching any fish</b>

For his first comment, Jason posted “K” (line 8). This was followed two minutes later, according to the timestamp, by a second post: “This tells me he isn't very persistent. It also show evidence that the man will get really frustrated if he can't get food.” Looking at the preceding comments, there are some noticeable similarities (bolded) between Amaya’s post and Jason’s first sentence (“This tells me that he is not very persistent” / “This tells me he isn’t very persistent”) and Wilhelmina’s post and Jason’s second sentence (“He is getting frustrated because he can't catch fish” / “It also show evidence that the man will get really frustrated if he can't get food”). These similarities suggest that Jason’s first post was a “key” that he used to unlock access to his classmates’ perspectives. Although he did not directly address them, Jason engaged Amaya and Wilhelmina by revoicing their comments in his own. Several comments later, Kendall posted “m,” and then four minutes later she posted a response to the question: “He was giving up hope of catching any fish” (lines 23, 27). Her comment bears a striking resemblance (bolded) to the three responses that immediately preceded her “m” post, which all mention lost hope or giving up hope (lines 18-21). Kendall, too, seemed to “game” the system to access her peers’ comments and fold them into her own.

Excerpt 4.7 shows two of the 18 instances of “uncloaking” found in the 32 cloaked talk threads. Eleven different students used these kinds of “key” posts, and three students of those 11 used posts more than once time: Theo (three instances in three different texts), Lukas (two in two different texts), Zach J. (two in two different texts). Students used these posts in different kinds of texts, fiction and nonfiction, and there did not seem to be a particular type of text or question that predicted these posts. These students understood the point of cloaking and the expected behavior, as the next example suggests, but they made their decisions to “go rogue” and interact with their classmates based on their own purposes rather than their teacher’s. In this excerpt (Excerpt 4.7) from a digital talk thread in *Crash*, Hayden posted “F” and then immediately apologized, an acknowledgement of the rules of the cloaking practice that he had just transgressed. After several of his classmates posted, he offered a response to Lisa’s question (“How might this change things?”) that seemed to weave words and ideas that were prevalent in several of the other posts (“it might,” “change,” “bully,” the notion that the character Crash could change his bullying ways). Given the length of time that separated his first two posts and his third (four minutes), one wonders if Hayden just needed a moment to review what his peers were thinking and identify the voices and language that would help express his own thinking.

Excerpt 4.7: Digital talk excerpt from *Crash* by Jerry Spinelli.

1	Mrs. G	How might this change things?
2	Hailee	They would become friends.
3	Erin	He may want to lose the race to become a good person.
4	<b>Henry</b>	<b>I think it will change thing</b> by crash losing the race.
5	Kendall	He wouldn't be as mean.
6	<b>Hayden</b>	<b>F</b>
7	<b>Hayden</b>	<b>Sorry for the F</b>
8	Lukas	He notices it
9	Kyla	Many he will let Webb win the race
10	<b>Ryan</b>	<b>Cause if he didnt see it he may still be a bully</b>
11	<b>Douglas</b>	He saw they could have been good friends. <b>Instead of being a bully to Webb.</b>
12		
13	Nicky	I think crash would give a gift for Webb.
14	<b>Donny</b>	<b>It might change things</b> by making crash be nice to weber.
15	Ruben	I don't really understand what that means, but it might make
16		Crash do or act in some way better. It will be for his
17		grandfather, and maybe Webb's grandfather, to.
18	<b>Theo</b>	<b>He might relise he doesn't have to be a bully.</b>
19	<b>Jason</b>	<b>This might change things</b> because Crash realized the gift and
30		he will now help Webb. I think Webb will be nicer to Crash.
31	<b>Amaya</b>	<b>I think this will change things</b> because Crash is starting to
32		realize he and Webb might be better off being friends.
33	<b>Hayden</b>	<b>It might change things because he is a bully and he might</b>
34		<b>want to Change things.</b>

It is possible to frame these students' actions in different ways. One could say that these students are cheating by first posting a false comment to open the digital talk thread and then by drawing on their classmates' words. Teachers who see cloaking as a method for assessing what kids "really know" might view Jason, Kendall, Hayden, and the other students as dishonest, unmotivated, or both. On the other hand, it is also possible to challenge this deficit-oriented frame and say that these same students are exhibiting ingenuity as they reorganize the digital environment so that digital talk serves their purposes (see Gutiérrez et al., 2017; McDermott & Raley, 2011). The "copying" that some might criticize could also be viewed as a reflection of the hybridity of classroom languages and a glimpse of how a student engaging in digital talk finds ways to integrate classmates' or her teacher's previous utterances as well as their anticipated responses to the ideas she is planning to share. Students might also need a scaffold, or a way into a text provided by other students' comments.

These data suggest that pre-design face-to-face and digital talk in Lisa's classroom was often, but not always, organized in ways that positioned Lisa as the gatekeeper of talk. Although students had ample opportunities to speak during read-alouds and did so enthusiastically, talk patterns in the face-to-face activity system suggested that students were rarely presented with opportunities to share textual interpretations or engage in extended ways with their peers about the text. Similarly, talk in the digital activity system seemed to engage students in broad, disconnected participation patterns of direct response to Lisa, aside from some notable exceptions of "rogue" student-directed interactions (e.g., student-posed questions and unclocking digital talk). These interactional practices contradicted the broader goals that Lisa brought to her teaching of foregrounding student-led meaning making and peer interaction.

## **Phase 2: Designing for Conceptual Knowledge Building via Digital Talk**

### **Phase 2 Baseline Assessment: What Do You Know about Theme?**

When Lisa and I met to identify the specific problem of practice we would explore together during Phase 2, she immediately suggested that we explore digital talk with a mini unit on identifying themes in poems. She explained that she had not spent much time on poetry with her students and also felt some urgency about addressing Common Core Standards related to theme. Because theme was a new concept for a number of the students, she viewed the mini unit as a good opportunity to explore how student interactions in Subtext could support what she described as "this aspect of social pedagogy ... how kids can leverage each other's comprehension" to develop understandings about theme.

Before we began our design work, Lisa and I decided to give the students a brief baseline assessment that would provide some information about what they already knew about theme. Lisa noted that she had seen many definitions for theme circulating among curricular guides, but she was using the definition that theme "is the message, the lesson, or the moral that the writer is trying to convey, and understanding the main idea of a poem, what it's about, and the voice or who's talking can help us get at theme." The assessment would serve as a starting point for our design and provide a "before" snapshot that we could look back on at the end of the unit to gauge changes in students' understandings. The assessment, conducted on a Google Form and completed on students' iPads, asked the students to read the poem "I'm Not Picky" by children's poet Kenn Nesbitt and write in a text box what they understood as the poem's theme (see

Appendix D for poems read during Phase 2 design work).

Results from this baseline assessment suggested that most of the students were unable to identify the poem’s theme of pickiness (to provide a synopsis of the poem, the speaker in the poem states that she/he is very easy to please when it comes to food and then lists dozens of unpalatable foods and one acceptable food item, macaroni and cheese). Two of the 23 students who took the assessment could correctly identify the theme of the Nesbitt poem. Thirteen students incorrectly identified the theme as “The character really loves mac and cheese” or some variation. Eight students indicated in their responses that they understood that the poem was conveying a “mixed message” because the speaker was in fact quite picky, but they were not able to articulate the theme on a more abstract level. Table 4.1 shows some examples that illustrate the three types of student responses that Lisa and I noticed.

Table 4.1: Pre-design assessment response examples.

Category of response	Example
Correct identification of theme (2 of 23 students)	<p>“The theme of this poem actually is pickiness (despite the title). In this poem, the character claims he or she is not picky, but at the end of this poem the character states that he or she prefers to eat macaroni and cheese most of the time.”</p> <p>“I can tell this poem has a theme of being picky even though they may not know.”</p>
Incorrect identification of theme (13 of 23 students)	<p>“I think the theme is that he really likes mac and cheese. And if he has mac and cheese he will eat it all and ask for more please.”</p> <p>“That he'll only eat Mac and cheese and only that.”</p>
Identification of speaker’s “mixed” messages (8 of 23 students)	<p>“I think is that he/her is not picky with Mac and cheese. But he/her will be picky if it's something else.”</p> <p>“the theme is that he really loves mac and cheese and he says he's not a picky eater but he really is.”</p>

### Design Cycle 1: Building Conceptual Knowledge in the Face-to-face and Digital Settings

**What we did.** Lisa was not surprised by the results of the baseline assessment because she was certain that most of the students had not studied the concept of theme before. After looking over the students’ responses together, we decided that reviewing the concepts of main

idea and voice, which Lisa said the students had studied before, would be an appropriate first step in helping students “level up” to identifying theme. Since so many students demonstrated unsure understandings of theme, we viewed the laying of a solid conceptual foundation as a critical step in moving toward the double-pronged objective of helping students learn how to identify themes in poems and use digital talk to deepen their thematic understandings.

Accordingly, for the first day we planned for Lisa to introduce the goals of the unit to the class, review the concepts of main idea and voice, and practice identifying main idea and voice in three poems (projected on the screen) as a class. Following this activity, students would individually read three poems in Subtext and post what they believed the main idea and voice were for each poem. We hoped these activities would help students develop more complete understandings of these concepts before we began talking about theme. To help us see what students internalized, Lisa suggested that we use the cloaking function for the Subtext posts. Because we were not focusing on digital talk on this first day, this use of the cloaking function for assessing individual understanding made sense to me, and I agreed.

Lisa began the class session by explaining the broader objectives of the unit she and the students were about to begin:

We’re gonna be working together on themes in poems for the next two weeks. We’re gonna look at how you’re thinking, how you’re participating, and what that looks like in Subtext. The test you all took [the pre-design assessment] gave us a starting point of what you know. At the end of the two weeks, we’re gonna take a similar test so you’ll be able to see if you have grown. So our goal in two weeks is to be experts in finding themes in poetry.

Following this general introduction and goal-setting, Lisa reviewed the concepts of main idea and voice using a slide presentation, reminding the students of their prior work with the concepts. After defining each term, she and the students read aloud and identified main idea and voice in three children’s poems, “Peter Peter Pizza Eater,” “I Ate a Ton of Sugar,” and “Sing a Song of Six Cents.” According to my field notes, Lisa used different types of talk (teacher lecture, teacher directions, known-answer questions, student read-aloud, verbal polls, whole-class conversation, and pair-share) during this review and practice. After going over the concepts of main idea and voice with the students (taking the same approach to reviewing and practicing voice as a whole class that had been used to review and practice the concept of main voice and using the same poems), Lisa shared the next step of the day’s poetry activity:

Your job in [Subtext] is two parts for today: You’re gonna read each poem, and you’re gonna make a comment. You’re gonna list the main idea, and in your comment, you will type “main idea” and right next to it, you will write what you think is the main idea for that poem. Then, in the same box, you can do it together, you’re going to do voice. You’re going to type in “voice” and then right next to it, you will write who you think the voice is. And in here, you’re also going to put why. For example, “I think the main idea is about a boy that doesn’t have a lot of money because in the last line, it says he needs to get a loan.” Okay? “I think the person’s voice is very happy because he seems to have a lot of sugar that he’s eating already.” So for each poem, you’re gonna post the main idea and voice.

She added that comments were cloaked. For the remainder of the allotted time for the poetry lesson, students worked on reading the three children’s poems (“The Proper Way to Eat” by John Frank, “Meat Loaf” by Kenn Nesbitt, and “Powdered Sugar” by Sydnie Kleinhenz) and their main idea and voice posts.

**What we learned.** At the end of the first day, Lisa and I met to reflect on the lesson and to look at the students’ Set A posts on main idea and voice in Subtext. She shared,

I was surprised that the main idea, from their feedback [students’ less clear articulations of main idea and voice in the whole-group examples earlier]. But then they by the time they got to the third one I was feeling much more comfortable that they were getting it ... I feel like my PowerPoint was a little bit long. But when they got to it [the students started their Subtext posts], I had one student who was getting confused [about] main idea and voice, and then I had one that couldn’t articulate the voice. He put one word, the word 'specific.' And I asked him what that meant for that, because it's about the feelings. So once they heard the trigger word "feelings," they seemed to [get it], so that seems to be helpful for them

Lisa was surprised that students had difficulty identifying the main idea and voice in the whole-class example poems because they had studied the concepts in the recent past. She thought that the multiple poem examples seemed to help the students refresh their memories and that the verbal feedback she had received during their whole-class review made her feel “by the time they got to the third [poem] ... much more comfortable that they were getting it.” Reviewing the 60 posts across the three poems, however, suggested a different story. As we looked at the answers, what was immediately apparent was that not all students had submitted posts for each of the poems. For the poem “Proper Way to Eat,” four students did not post their ideas on either main idea or voice, and five students posted on main idea but not on voice. For “Meat Loaf,” one student did not post on main idea and three students did not post on voice, and for “Powdered Sugar,” three students did not post on either main idea or voice and four students posted on main idea but not voice. All of the students posted at least once, but the missing posts suggested conceptual uncertainty and/or a lack of time that precluded student responses.

Reading over the posts for main idea and voice showed us that they were, as Lisa noted, “all over the place.” We had expected to see some variety of interpretations in their posts, but the eclectic range of responses told us that the “on track” comments that we had heard during the face-to-face class review did not represent all students’ understandings. Table 4.2 provides a sample of responses that illustrate the broad range of students’ conceptual understandings.

Table 4.2: Examples of students’ main idea and voice posts, Design Cycle 1.

Poem	Main idea	Voice
“Proper Way to Eat”	<ul style="list-style-type: none"> <li>• The main idea is he/she is telling us how to eat our food properly.</li> <li>• I think the main idea is that</li> </ul>	<ul style="list-style-type: none"> <li>• I think the voice is a kid because of the types of food he mentioned.</li> </ul>

	<p>there are many different ways to eat your food.</p> <ul style="list-style-type: none"> <li>● Rithem (rhythm); I think the author was trying to make it have rithem to the poem.</li> <li>● I think the main idea to this is to eat like a kid because children usually hate spinach.</li> <li>● I think the main idea is that how to eat everything else but your vegetables</li> </ul>	<ul style="list-style-type: none"> <li>● I think that the voice is coming from a kid who likes to play with his food because he is telling you how to have fun while eating</li> <li>● No response provided by student</li> <li>● The voice is happy</li> <li>● The voice is that he really doesn't want the spinach.</li> </ul>
“Meat Loaf”	<ul style="list-style-type: none"> <li>● bad meatloaf</li> <li>● The main idea is to look at the bright side of things.</li> <li>● Is that there mom is really bad at making meat loaf. I think that is the main idea because they [mention] a lot of ways it went wrong.</li> </ul>	<ul style="list-style-type: none"> <li>● crazy</li> <li>● The voice is exited and sarcastic.</li> <li>● I think that the voice does not like the mothers cooking because he said that the dog passed out.</li> <li>● The writer is staying calm and thinking positive.</li> <li>● I think the mood is disastrous because the meatloaf caught on fire and everyone is freaking out.</li> </ul>
“Powdered Sugar”	<ul style="list-style-type: none"> <li>● The main idea of this poem is that the character likes powdered sugar. I know this because a lot of times in the poem, the character mentions powdered sugar.</li> <li>● I think the main idea is powdered sugar because the name of the poem is powdered sugar</li> <li>● I think the main idea is to not breath in powdered</li> </ul>	<ul style="list-style-type: none"> <li>● The voice in this story is surprised/excited because when the character coughs away the powdered sugar, everyone is surprised, but when the character first arrives at the location, he or she is excited for the powdered sugar.</li> <li>● The voice is a funny</li> </ul>

	<p>sugar to quickly because it set of a chain events.</p> <ul style="list-style-type: none"> <li>● She's obsessed with powdered sugar.</li> </ul>	<p>happy voice.</p> <ul style="list-style-type: none"> <li>● The voice is that he is scared of choking and happy that he has a lot of powdered sugar</li> <li>● She loves to eat sugar.</li> <li>● I think that the author is telling us that powdered sugar is messy. Because she makes a big mess.</li> </ul>
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Although we did see some relevant main idea and voice posts for each poem, most students' responses suggested conceptual confusion. The number of posts missing a rationale (the "why," as Lisa said) was further indication of students' uncertainty. Although these posts surprised us, Lisa and I agreed that a unique affordance of the digital was the ability to instantly access information about students' individual understandings that could get lost if a teacher relied solely on whole-class verbal assessments.

## Design Cycle 2: Revisiting Conceptual Knowledge in the Face-to-face and Digital Settings

**What we did.** The information we learned from the main idea and voice postings made it clear that students needed more support around these concepts before we could broach the topic of theme. We therefore decided to design a lesson that would provide more conceptual support through whole-class discussion and digital talk: after a whole-class review of main idea and voice using a familiar poem (Lisa suggested "Powdered Sugar" because students seemed to especially struggle with identifying voice in this poem), students would pair up, read all of their partner's main idea and voice posts, and then respond to each post by stating if they agreed or disagreed with their partner's idea about main idea or voice (choosing one concept to focus on) and why. We hoped these activities would provide students with a layered approach to examining and boosting their own conceptual understandings.

After calling the students to the front of the room by the screen, Lisa started with a review of the concepts main idea ("It's what the poem is about, right?") and voice ("How the author feels about the subject of the poem."), using the presentation slides she had used for the previous lesson. She explained that the class was spending some more time on the poem "because looking at [their] posts in Subtext made [her] realize the poem had thrown some of us for a loop ... so we're gonna talk about your thoughts on main idea and voice and see if we can come to a common idea about them." Given this stated goal, it was unexpected to see the discussion take the format of recitation, as Excerpt 4.8 suggests.

Excerpt 4.8: Whole-class review of main idea and voice in "Powdered Sugar."

- |     |   |
|-----|---|
| 1 L | So what is the poem about? What is the main idea? [Many |
| 2   | hands go up; nodding to Ruben] Okay, Ruben?             |

3 Ruben If someone handles powdered sugar be careful, because one  
4 puff can make it on everywhere and get into everything.  
5 [Some students laugh]  
6 L In this case, who was that someone? Theo?  
7 Theo It's probably a kid who's addicted to sugar.  
8 L Okay, so we know that kids like sugar, right?  
9 Students [laughing] Yeah!  
10 L Here, it's almost like the powdered sugar becomes like a  
11 storm that flurries around. [Pauses] What about voice? How  
12 does the author feel about the subject? [Many hands go up]  
13 Jason?  
14 Jason Like everything is chaotic because there's powdered sugar  
15 everywhere.  
16 L Uh huh, and then at the end, how does he feel?  
17 Jason Like he wants more powdered sugar.  
18 L [nods] Excellent.

Lisa began with a question that could invite many possible interpretations (“So what is the poem about?”), but her responses to students’ comments did not generate further commentary and exploration. For example, rather than asking Ruben to explain his understanding about the theme, she posed what seems to be a known-answer question: “In this case, who was that someone?” After Theo ventured a guess that “it’s probably a kid who’s addicted to sugar,” Lisa validated his answer and provided a plausible rationale: “Okay, so we know that kids like sugar, right?” She followed this with what seems to be her own interpretation of the main idea: “it’s almost like the powdered sugar becomes like a storm that flurries around.” Although she did not explicitly state that this was the main idea of the poem, moving on to the topic of voice (line 11) without asking for additional ideas or noting that there could be many additional opinions indicated that the question of main idea had been addressed. The IRE pattern continued in her exchange with Jason about voice. Lisa initiated questions (“How does the author feel about the subject?” “And at the end, how does he feel?”) and evaluated Jason’s responses to her known-answer questions (“Uh huh,” “Excellent”). While face-to-face talk in Lisa’s class often was organized as recitation, the fact that these interactional rules continued to hold when the goal was to “see if we can come to a common idea about” main idea and voice points to the persistent tension between Lisa’s pedagogical beliefs and the actual social organization of face-to-face talk in her classroom.

Following this succinct review, Lisa explained the partner post activity in Subtext for Poem Set A. Students chose partners and returned to their work stations. As students began reading and commenting on partner posts, Lisa followed along in Subtext, refreshing the digital thread feeds periodically to see what her students were posting. However, about 10 minutes into the activity, it became clear that almost half of the students were experiencing a technical glitch that was not allowing them to make their posts visible to their partners. After troubleshooting to no avail for a few minutes, Lisa redirected the class to a social studies assignment.

**What we learned.** In our post-class reflection, Lisa commented that the technical difficulties had “thrown [her] because [the students’] commenting was an important part of what was planned.” Our original idea had been to read the students’ agree/disagree posts to their

partners and then check their original main idea and voice posts to see if there were any differences, which might show incorporation of other voices in students' meaning making. Nonetheless, we decided to take the technical glitch in stride and learn what we could from the existing agree/disagree posts.

There were 28 available responses across the three poems (eight for "Proper Way to Eat," 11 for "Meat Loaf," and nine for "Powdered Sugar"). Although we knew these represented only a modest fraction of the 81 responses we had hoped to see from the 27 students, we still found reviewing the available partner posts helpful because they showed us that some students were able to articulate why they agreed or disagreed with their partners using evidence from the poem while other students' responses suggested that they struggled with the concepts and/or formulating a substantive response. We saw that some students expressed what they agreed or disagreed with and why (e.g., "I disagree with your main idea because I don't think the poem is about the spinach, I think it is also about how he messily eats stuff"; "I agree with the part where you said the author was trying to be funny because usually meat loaf is a fun topic. That is because most people don't make it right, and it is horrible.") while other posts offered a spare agreement or disagreement (e.g., "I thought pretty much the same thing"; "I agree with both because it makes sense.") or did not provide a relevant response to the partner post (e.g., "I think the powdered sugar got on everybody in the area. Or the powdered sugar got on the person.").

Among the available partner posts, seven students disagreed with their partners' ideas about main idea or voice and 21 agreed with their partners. When we compared students' responses to their partners to their original posts for main idea and voice, we found that all of the students who disagreed shared the reasoning they provided in their original posts, while about half of the students who agreed with their partners showed similar thinking in their original posts and half expressed a different idea in their original post but still agreed with their partners.

These posts suggested to Lisa and me that the students needed more support in terms of concept-building and dialogic interaction in Subtext. We also wondered if asking students to engage through agreement/disagreement could have had a negative impact on authentic idea engagement because disagreement was socially risky. Agreement with a different opinion could indicate a student's integration of a new idea, but we also considered how the sway of social pressure could shape students' responses. As Lisa said, "People are happy to agree but saying 'I disagree' is such a negative thing so it's a tricky one because of peer pressure." She then brought up the idea of using the SPECS commenting guidelines that the students had experience with:

I wonder if instead of "I agree" or "I disagree," just to have them do a SPECS comment. We've been using that throughout the year, and I'm thinking I want to try that tomorrow and maybe that would get away from the judgment part ... You might get some of that natural discourse.

Lisa wondered if using the SPECS guidelines for digital talk going forward could help us address some of the issues we noticed in the students' posts. SPECS asked students to specifically respond to a topic and ground that response in evidence from the text. SPECS also expected students to consider audience and engage audience when commenting, which Lisa thought "could free up the kids to say what they mean because SPECS made them do it." Lisa and I hoped that these commenting guidelines would help students clearly share their conceptual understandings and engage more purposefully with their classmates.

### Design Cycle 3: Extending Conceptual Knowledge in Face-to-face and Digital Settings

**What we did.** Using what we learned from the partner posts activity, Lisa and I designed the next unit session to offer conceptual reinforcement, more structured digital talk guidelines, and multiple opportunities to practice applying these concepts in face-to-face and digital settings. First, Lisa would “reset” commenting rules by reviewing the SPECS guidelines and briefly review main idea and voice using a new poem, “Diving Board” by Shel Silverstein. In order to help students see the connection between these concepts and theme, the class would then reexamine “Diving Board” and an additional poem through the lens of theme. We hoped that this whole-class session would help students to continue building up their conceptual understandings. In the digital setting, students would read two new poems and post a SPECS comment about each poem’s theme. After all students had posted, students would read all posts made by members of their pre-established small reading groups (four students in each group). Then, using SPECS guidelines, the students would post a comment explaining if reading a larger variety of posts had changed their understandings of the poems’ themes in any way. With the previous commenting activity, students had interacted with only one other student. With this commenting exercise, we hoped to engage students with more classmates’ ideas and in ways that encouraged a metacognitive lens. In other words, as Lisa put it, we were “looking for the crowdsourcing effect -- are they learning about theme from each other?”

As planned, Lisa began the next poetry session with a review of the SPECS guidelines with her students, referring to the SPECS poster taped to the whiteboard and calling on students to explain the meaning behind different letters in the acronym (Specific to topic, Punctuation, Evidence from text, Carefully considerate, Sentences). She emphasized that students would use SPECS going forward rather than the “I agree/disagree” stems that they had used for their Poem Set A partner posts. Following this review, she projected the poem “Diving Board” and explained, “Today we’re gonna kind of dive into this motion of theme. After the past couple of days, we’ve been looking specifically at main idea and voice, and we’re gonna take it a step further with a poem that you might have seen before.” After asking Dallas to read the poem aloud, she called on Lukas, Savannah, Nicky, and Sophia to share their thoughts on main idea and voice in the poem, synthesizing their ideas as a springboard to elicit talk about the poem’s theme as this next excerpt (Excerpt 4.9) shows:

Excerpt 4.9: Identifying theme in “Diving Board” by Shel Silverstein.

1	L	Let's take another step to this same poem. So if the main
2		idea here [pointing to the poem on the screen] is someone
3		who is not diving yet because he's checking all this stuff.
4		And the voice is that this other person is pretty annoyed
5		because he just wants him to dive, what do you think
6		[advancing the poem slide to the next which reads “Theme:
7		Poet’s Message”] the poet's message is, that this poet is
8		trying to get us to learn or think about? [Several students
9		raise their hands] Jason?
10	Jason	If you’re doing something you’re not too sure about, just do
11		it.

12 L Say that a bit louder?  
 13 Jason When you're not sure about something, just do it.  
 14 Lisa Okay, so when you're not quite sure, get in there. Ruben?  
 15 Ruben Take risks even though that all those wrong things [pointing  
 16 to the poem and drawing his finger down the list of items in  
 17 the poem] could do wrong.  
 18 Lisa Okay, take risks.

This introduction to theme reflects IRE norms, with Lisa posing a question and briefly revoicing students' answers (lines 13, 18) before proceeding to the next unconnected question and answer. However, as Lisa and the students turned to the next poem, "If I Were in Charge of the World," more dialogically oriented talk practices emerged. The following segment of the class discussion of the poem's theme (Excerpt 4.10) illustrates how students' responses were used as building blocks for more in-depth exploration of their ideas.

Excerpt 4.10: Identifying theme in "If I Were in Charge of the World" by Judith Viorst.

1 L Ok, so let's kind of look at this through this lens. What I'd  
 2 like you to do is with one or two people sitting next to you,  
 3 share what you think the theme is. [The kids turn to partners  
 4 and share their ideas about main idea and voice. After the  
 5 kids talk with their partners for about 30 seconds, L claps  
 6 her hands]  
 7 L Okay, who would like to share out the theme? [Several  
 8 hands go up] Allie?  
 9 Allie Um, the world isn't perfect?  
 10 L Okay, keep talking. Why did you pick that?  
 11 Allie Because we want all these things [gesturing to poem on the  
 12 screen], and so -- life isn't perfect because we want more of  
 13 certain stuff.  
 14 L Okay, so there are things in here [the poem] that he doesn't  
 15 or she doesn't like. So do you think he feels like, "Get over  
 16 it, it's not perfect," that type of thing? [Allie doesn't say  
 17 anything. Hands go up.] Kat?  
 18 Kat I have something to go with Allie. So the world can be  
 19 perfect for other people, but it's not perfect for the character.  
 20 L So what do you think the message is for other people?  
 21 Kat Um, so just kind of keep on trying and maybe it could be  
 22 perfect. For some other people, it's perfect for them.  
 23 Kat Um, so just kind of keep on trying and maybe it could be  
 24 perfect. For some other people, it's perfect for them.  
 25 L Now do you know people who have a perfect life?  
 26 Kat I don't.  
 27 L So maybe adding on to that, maybe all life isn't perfect.

There is a difference in the interactional patterns in this conversation and the one directly preceding it (Excerpt 4.9). Lisa begins by asking the students to share ideas they had about the poem's theme. Allie offers her response, her prosody conveying uncertainty about knowing the "right" answer: "Um, the world isn't perfect?" Rather than pushing ahead to a new, unrelated question, Lisa asks Allie to "keep talking" and explain how she arrived at her understanding of theme (line 10). Allie cites (and points to) textual evidence ("we want all these things") and explains her inference ("and so -- life isn't perfect because we want more of certain stuff."). Lisa revoices Allie's comment ("Okay, so there are things in here that he doesn't or she doesn't like") and asks her to further comment on her understanding of the character's perspective. It is only when Allie does not offer a response that Lisa calls on Kat. Kat explicitly connects her response to Allie's ("I have something to go with Allie"), building on Allie's perception of the speaker's point of view by suggesting that perhaps "the world can be perfect for other people, but it's not perfect for the character." Lisa encourages Kat to apply her idea more abstractly and consider what "the message is for other people." Together, Kat and Lisa consider the possibility of a perfect life, drawing on Kat's life experiences to ground the deliberation ("Now do you know people who have a perfect life?"). Lisa uses that moment of deliberation to expand on Kat's comment: "So maybe adding on to that, maybe all life isn't perfect." While Lisa strongly guides this conversation, her questions in this segment seem to structure exploration of student ideas in a way that was not typical in other class face-to-face and digital talk opportunities.

Following this whole-class introduction to theme, Lisa explained the next part of the lesson to her students:

Here's what your task is. You have new poems in Subtext. And there's only a couple of poems that are in there. For each of these, you're going to read through, and you're going to do a post that says the theme [writes "theme" on the whiteboard]. Remember the concept of theme is this message to everybody that reads it. What is that poet hoping people will take away and think about for that poem? As soon as you finish that, you're going to read [independent reading book] at your spot.

As students worked on the two new poems, "Face Poem" and "October Dilemma" by Amy Ludwig VanDerwater, Lisa read students' comments in Subtext in real time and conferred with students as she walked around the room. Several minutes into the activity, she quietly told me that she noticed while reading posts that several students seemed to be conflating the concepts of main idea and theme. Originally, we had planned for students to go back into the two VanDerwater poems after everyone finished posting theme comments and post a SPECS comment explaining if their understanding of theme had changed. Presented with evidence of conceptual confusion in students' Subtext comments, however, we faced a choice: have the students continue reading, posting, and commenting as we had planned, or stop the current activity and redesign to address the confusion. Stopping the activity and addressing conceptual confusion before students read each other's posts made the most sense to both of us. We did not think it would be beneficial to push students forward with shaky understandings and misunderstandings of theme. Accordingly, after we finished this conversation, Lisa asked her students to stop where they were and explained that everyone would return to the poems the following day.

**What we learned.** Having access to their Subtext SPECS comments in real time helped

us notice students' early conceptual confusion around theme and main idea. As Lisa shared during our post-class reflection,

I think it went well. Um, but what I recognized in the comments--and which is what I kind of thought may happen, but I didn't realize it would happen so fast--is getting theme and main idea confused. So there were about seven students that I saw as they were doing theme, I was like, 'That's not the theme.' Like they were too fast, not ready to go to that piece. So I just kind of kept reiterating, "Well, what's the poem about and what's the message." Because I think they know, I think they know the theme.

Lisa believed that many students had some understanding of the concept of theme, but some of the comments made her wonder if the transition, from specifying a poem's main idea and voice to thinking more abstractly about its theme, was "too fast." We both agreed that halting the activity to redesign was a good pedagogical decision and that revisiting the concept of theme at the next poetry session was important. Lisa thought the students might need visual aids to refer to while they were reading as well as some examples of theme to give them an idea of how main idea was different. Even though the class had talked about theme and looked at two examples, it was apparent that at least some students might benefit from more examples. She said that she wanted "to make an anchor chart that shows the relation between main idea, voice, and theme, and maybe have some visuals and examples that go with it ... So when they think of the theme, they have the visual to help them." I suggested that one additional way of representing the concept of theme might be to apply it to a genre they were familiar with, fairy tales. Lisa was enthusiastic about this idea. We decided to first offer these additional tools for conceptual understanding in the next cycle and then ask students to revisit "October Dilemma" and "Face Poem" with what we hoped would be more robust understandings of theme.

#### **Design Cycle 4: Building Conceptual Knowledge in Face-to-face and Digital Settings, "Take 2."**

**What we did.** Lisa began the following poetry lesson by calling all the students to the front of the room by the projector, as she had for the previous lesson. The screen showed a slide that said "Theme: Take 2," and hanging on either side of the screen were two paper posters that Lisa had created. One (Figure 4.1) showed the words "main idea," "voice," and "theme" with their definitions. Each word and its definition was written in a different color ink, and main idea

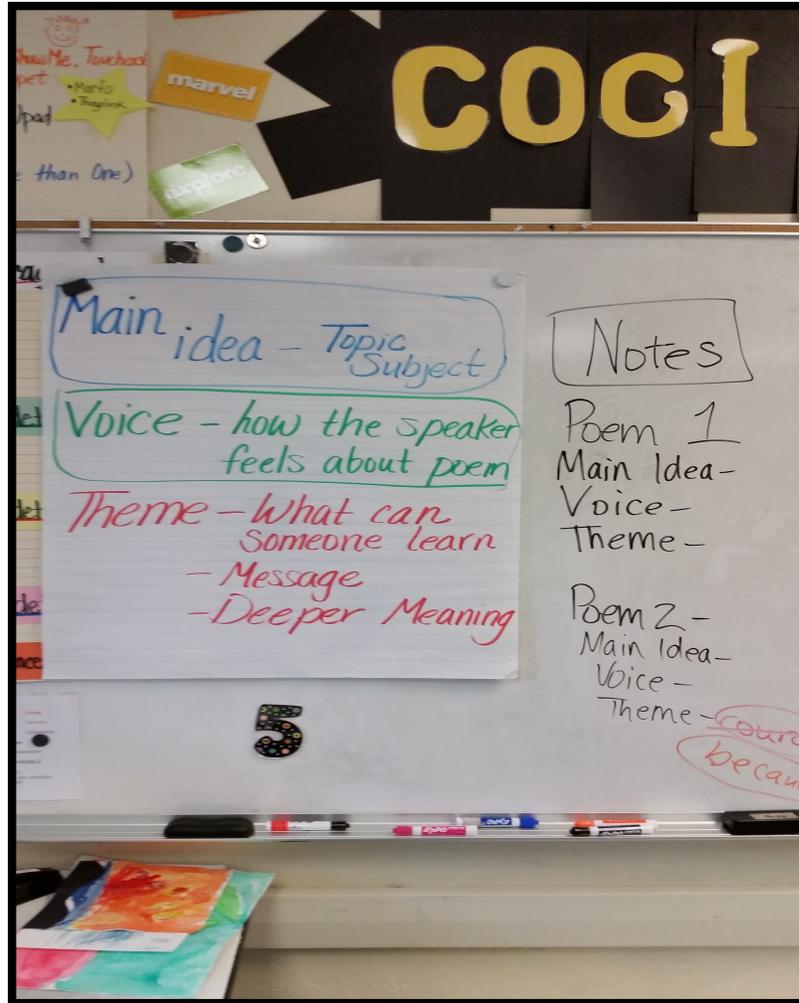


Figure 4.1: Lisa's poster of main idea, voice, theme for Design Cycle 4.

and voice were boxed off and position above theme. The other poster (Figure 4.2) featured a colorfully executed definition for theme (with embedded mnemonic device: “The/message”), with common example themes such as “compassion,” “never give up,” “friendship,” “courage,” and “be responsible” bordering the centered definition. Standing in front of these analog and digital tools, Lisa explained to the class the reason for our “Take 2,” framing the previous posting activity on theme as a valuable part of the learning process and as an example of the unofficial class mantra, “Experiment, fail, learn repeat”:

But notice [pointing to the screen] it says “Take 2.” This is what happens when you learn something new. Our brain is trying to make it fit in the right compartment, and sometimes it gets connected or sometimes a little confused [L waves her hands to trace connections] with something we already know. And for some of us with theme, that exactly happened. Miss Jenni and I had realized that some of you were thinking the main idea would actually be the theme and vice versa. So our brain is trying to make those

connections. And that's actually part of learning, is making those kinds of connections. So today I'm gonna try to take it from a different angle. To make it a little more clear today, 'cause yesterday was our first try. That's what happens, right? Experiment, fail, learn, repeat. So it's a work in progress.

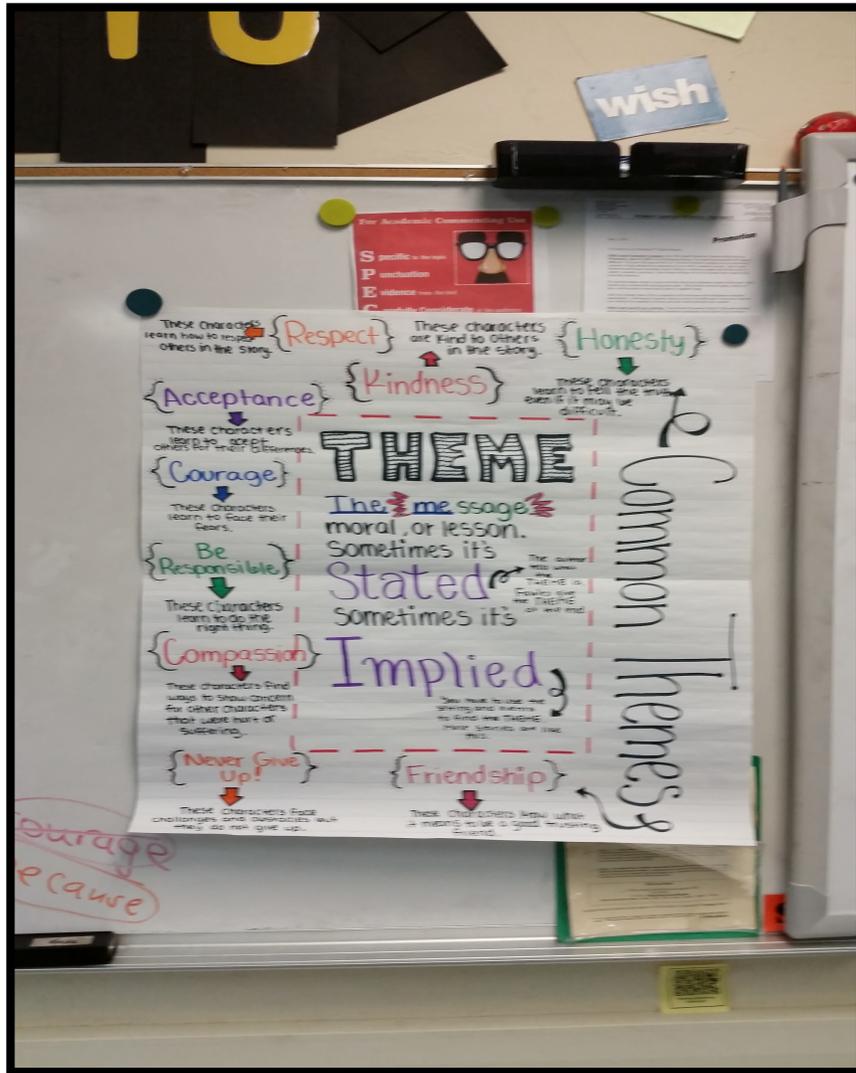


Figure 4.2: Lisa's poster of theme and examples of themes, Design Cycle 4.

By framing students' confusion as an indication of "our brain[s] trying to make those connections," Lisa indicated that a "Take 2" review of the concepts was expected and, further, that the struggle to master the concepts was an important part of students' developing understandings. Pointing to each word on the poster, Lisa reviewed the three concepts with succinct definitions:

We think of our main idea as the topic or the subject of the poem. We've been talking

about it as what the poem is about. But I think if we kind of think of it through the lens or the idea of it being the topic or the subject of the poem, that can kind of help those connections easier. The voice, how the speaker feels about the poem. And then the theme. What can someone learn from reading that piece, or what's the message or the deeper meaning?

As she continued, she turned to the poster on theme (Figure 4.2), supporting her lecture by gesturing to different areas relevant to her points:

So theme's the [tapping poster] message, moral or lesson, it's stated [taps the word] or implied [taps the word]. Don't get too caught up -- I'm telling you today maybe three or four different ways of thinking about the theme. But think bigger, larger -- maybe it is friendship [points to the word] or courage [points]. In the poem about changing the world, we could say that being trusted or respected is a theme. Never giving us, compassion, being responsible, courage, acceptance, respect, kindness, honesty, these are all examples of themes. And we could keep filling up the paper with some more of these.

Following this broad overview of the three concepts, she told the students that they would now, as a class, think about some examples of “theme as it that was trying to teach someone something.” Lisa projected an image from the main characters from the Disney movie Beauty and the Beast and asked students to share what they thought a theme from the story could be, adding that “theme is something we think about in all kinds of writing, not just poetry.” In addition to exciting the students, applying theme to the familiar story seemed to provide an opportunity for at least one student to work through a misunderstanding of theme by considering the voices of his classmates and teacher, as Excerpt 4.11 illustrates.

Excerpt 4.11: Whole-class review of the concept of theme through a fairy tale.

1	L	So what do you think the message could be? Or what do you
2		think that someone could learn from a story like that? Can
3		you turn to someone seated next to you to share? [The kids
4		turn to each other and share their ideas for 30 seconds]
5	L	What are the big themes here, the big lessons you think
6		someone can learn from a story like this. [hands go up]
7		Okay, Savannah?
8	Savannah	Doesn't matter what you look like.
9	L	Okay, doesn't matter what you look like. Kaden?
10	Kaden	People can change people.
11	L	Okay, people can change other people.
12	Nicky	You can be a person, then you can be a beast, then you can
13		be a person again.
14		[Some students laugh at this comment].
15	L	Can I teach you that? Can I turn you into a beast?
16	Nicky	[Smiles] Yes. [Several other students turn to talk with their
17		partners, giggling. L hushes them.]

18 L So take that [to Nicky] and let's shift it a little bit. I'm gonna  
 19 come back to you.  
 20 Nicky Okay.  
 21 L Okay, Alli?  
 22 Alli Don't judge somebody on how they look.  
 23 L Okay, don't judge someone on how they look. Hailee?  
 24 Hailee Don't judge someone by how they look, like look inside.  
 25 L Okay, so don't judge someone by how they look, inside it  
 26 could be a different story. [turning to Nicky] Nicky, did you  
 27 want to shift that?  
 28 Nicky Oh, Hailee just said kind of what I was gonna say.  
 29 L Okay, so just repeat what.  
 30 Nicky So it doesn't matter on the outside but what's on the inside.  
 31 L Okay, so pause for a second. That is what someone can  
 32 learn, if that story was teaching someone.

After a pair-share to discuss possible themes in *Beauty and the Beast*, Lisa called on Savannah, Kaden, and Nicky to share their ideas. Lisa revoiced Savannah's and Kaden's ideas without further comment, suggesting that their ideas were valid. Nicky's comment, however, drew additional questioning from Lisa. His idea ("You can be a person, then you can be a beast, then you can be a person again.") summarized a major plot detail in the story, indicating a possible mix-up between main idea, which the class has been thinking about in terms of "what the poem is about," and the deeper message conveyed by theme. Lisa's questioning suggested that Nicky should reconsider his comment: "Can I teach you that? Can I turn you into a beast?" Nicky's playful response drew laughs from his classmates, but it should be noted that his original comment seemed to have been offered in earnest. Lisa called on other students, but not before she let Nicky know that he would have another chance to share his "shifted" thinking. When Lisa returned to Nicky, he affirmed his classmate Hailee's immediately preceding comment and echoed it in his reformulated response: "Oh, Hailee just said kind of what I was gonna say ... So it doesn't matter on the outside but what's on the inside" (lines 30). While it is possible that Nicky was repeating what he perceived to be a "correct" answer rather than demonstrating a qualitatively different understanding of theme, that fact that he related his idea to Hailee's out of the many available to him suggests his active negotiation of voices: his own, his teacher's, and his classmates.' The conversation seemed to provide a space in which he could experiment and play with different ideas about theme and negotiate voices to acknowledge and to appropriate.

Following the whole-class review of theme, Lisa asked students to re-read "Face Poem" and "October Dilemma," the two poems from the previous session, and post what they thought the theme was for each poem. When all students had posted their theme comments, Lisa asked them to return to the poems and read what the three other members of their pre-established reading groups posted as themes. After reading those posts, students would consider those different ideas in a follow-up response posting, as Lisa explained:

Think about what your group is saying, what they think, and ask yourself, "Now that I've read my teammates' posts, had my understanding of the poem's theme changed? Is that what I also think about theme? Or is it different from what I said but do I agree with it

still? Or is it different and I don't think my mind is changed?" And then explain why or why not.

Our hope was that the extra face-to-face review of theme would help students build a stronger conceptual base, which we would gauge through their posts about the poems' themes. We also hoped to engage all students with multiple ideas and multiple voices in the digital setting by asking them to read their reading group members' posts and to interact with those ideas in a response post.

**What we learned.** The percentages of relevant theme identification in both poems (approximately 70% for "Face Poem" and approximately 74% for "October Dilemma") broadly suggested that the additional review of theme had mediated a supported stronger understanding of theme for some students. For "October Dilemma," 19 students provided themes that indicated conceptual understanding and 8 students provided themes that indicated conceptual misunderstanding. For "Face Poem," 20 students provided themes that indicated conceptual understanding and 7 students provided themes that indicated conceptual misunderstanding (see Table 4.3 for example responses). Among the comments that indicated conceptual misunderstanding, we noticed that students often identified the main idea or topic as the theme (e.g., "That he doesn't want to kill the mouse.") or provided a summary of the poem (e.g., "The theme is that there is a child, and he had a mouse in his house. He wants to get rid of the mouse, but doesn't want to kill it.").

Table 4.3: Students' posts about theme in "October Dilemma" and "Face Poem."

Poem	Conceptual understanding	Conceptual misunderstanding
"October Dilemma"	<p>I think that the theme is compassion. I think this because even though the character does not want the mouse in his house, though he does not want to hurt the mouse.</p> <p>I think the theme is kindness or maybe honesty. I think that because she does not want to trap the mouse.</p> <p>I think the theme of this poem is that you should care more about animals. The character avoids laying the trap that would kill the mouse.</p>	<p>I think the theme is that she doesn't want to kill the mouse but she wants it gone. I think this because she says she wants the mouse gone but she also says she doesn't want to kill it.</p> <p>That he doesn't want to kill the mouse.</p> <p>The theme is that there is a child, and he has a mouse in his house. He wants to get rid of the mouse, but doesn't want to kill it.</p>
"Face Poem"	I think the theme is that wisdom comes with age.	He is happy even though his parents are poor. Even though

	<p>Older people know lots more because they have had experience.</p> <p>I think the theme is that older people have more experience than kids or teens. Because when the poem said 'My Parents were poor but happy' i thought that when he was young his parents were poor, but they were happy.</p>	<p>he is old he has grandchild to make him laugh.</p> <p>The theme is that when he touched the corner of his grandpas eye. That he was remembering memory's he had with his grandpa.</p> <p>The theme is that someone asks their gramps why his face is so wrinkly. And he feels he like about how he became a man and that whatnot.</p>
--	--	--

Lisa and I noticed that four of the seven students whose Cycle 3 “Face Poem” posts had demonstrated conceptual confusion had identified relevant themes when they revisited “Face Poem” again in Cycle 4. These apparent shifts in understanding along with the higher percentage of relevant student responses suggested that the design adjustments (reviewing theme with additional mediating tools in the face-to-face setting) had helped some students gain stronger conceptual footing.

Response posts to teammates’ ideas (the second round of posting) suggested that some students’ ideas about theme had changed as a result of interacting with their peers. For “Face Poem,” four students stated that their ideas about the theme had changed after reading their teammates’ posts. Three of the four students had demonstrated conceptual misunderstanding in their original posts. For “October Dilemma,” five students stated that their opinions had changed after reading their peers’ posts. All five students had demonstrated conceptual misunderstanding in their original theme posts. These apparent shifts in students’ understandings possibly indicate that their classmates’ comments acted as additional mediating tools in the digital setting that helped boost conceptual knowledge.

With both poems, we found that most students reported that their ideas had not changed after reading their peers’ posts. For “Face Poem,” 23 students stated that they had not changed their ideas because their team members had identified the same or a similar theme, three students stated that their understanding of the theme had not changed without explaining why, and one student stated that his understanding had not changed because he believed his original idea was accurate. For “October Dilemma,” 22 students stated that their understandings were unchanged because their responses were similar to those their teammates posted, two stated that their understandings were unchanged without explanation, and three stated that their understandings were unchanged because they believed their original responses were more accurate. These results did not surprise us due to the relatively high percentages of relevant theme identification in both poems

## Post-design Assessment: What Do You Know about Theme?

The ultimate goal of our design work, as Lisa had told the students on the first day of the unit, was to help the students “be experts in finding themes in poetry.” Our pre-design work had indicated that almost all of the students had difficulty identifying theme in poetry. To gauge students’ conceptual understandings of theme at the end of the design cycles, we administered a post-design assessment. The assessment, conducted on a Google Form and completed on students’ iPads, asked the students to read the poem “Living” by Denise Levertov and write in a text box what they understood as the poem’s theme (see Appendix D for poems read during Phase 2 design work and Appendix E for a comparative table of students’ pre- and post-design assessment responses).

Results from this post-design assessment suggested that most of the students could identify a relevant theme. Fifteen of the 23 students (65%) who took the assessment<sup>30</sup> were able to correctly identify the theme of “Living,” and eight students incorrectly identified the theme. Table 4.4 provides a sampling of student responses for both categories. Lisa and I categorized a response as demonstrating “correct” identification of theme if it adequately addressed the guiding definitions that Lisa had offered during class: “What’s the message, deeper meaning, or the bigger lesson?” Responses that seemed to show conceptual confusion offered “messages” (e.g., “They are saying you might want to let the lizard go,” “summer is almost over and it's going to be cold so every minute in summer is like the last minute”) but did not demonstrate understanding of a broader, more generalizable lesson or message.

Table 4.4: Post-design assessment response examples.

Category of response	Example
Identification of relevant theme (15 of 23 students)	<p>I think the theme is that you should respect and spend every minute like it is the last with the things you love and like.</p> <p>I think the theme is how time goes by so fast.I think that because how the author was making the character say all of the seasons and how they said each minute the last minute.</p> <p>I think that the theme of this story is that life is only so long, and that you should enjoy it. At the same time, I think that the writer doesn't want you to anticipate death constantly, or nothing will come out of life.</p>

<sup>30</sup> Some students were absent on the day the baseline assessment was given and some were absent on the day the post-design assessment was given, so we removed those students when we compared results.

<p>Incorrect identification of relevant theme (8 of 23 students)</p>	<p>The theme is that it is a peaceful summer day, and this kid caught a lizard. They are saying you might want to let the lizard go.</p> <p>I think the theme is that in the summer everything is so dreamy and pretty. I think this because the leafs and grass are sleeping. The salamander is drifting carelessly. I think the theme means that in summer it is easy to get salamanders.</p> <p>So the theme is summer is almost over and it's going to be cold so every minute in summer is like the last minute.</p>
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These post-design assessment results suggested that some of the adjustments we had made in the face-to-face and digital activity systems over the course of the unit had positively reorganized learning about theme for some students. In the baseline assessment, two of the 23 students (8.7%) were able to identify a relevant theme. In the post-design assessment, 15 of the 23 students (65.2%) were able to identify a relevant theme. As Lisa pointed out, “Living” was probably the most challenging poem among the several that the students had read during the mini unit, so the fact that many students were able to articulate a relevant theme and explain their reasoning was encouraging. To get to this point, however, required far more face-to-face classroom talk than we had envisioned. Our original goal had been to help students develop conceptual understandings about theme with an emphasis on the role of digital talk as a mediating tool. Our assumption had been that students would learn the concepts in the face-to-face setting and then broaden their understandings collaboratively through digital talk--an assumption that learning would occur if we thoughtfully “designed forward” from the face-to-face to the digital. Instead, what we found was that iterating on our designs actually meant going backwards--and the use of additional mediating tools in the face-to-face setting--because any kind of productive digital talk was predicated on students having a stable conceptual foundation to speak from.

This is not to say that digital talk did not mediate learning in important ways during the mini unit. Our data suggested that digital talk may have offered a valuable discursive space for thinking about main idea, voice, and theme, and for interacting with others’ ideas about these concepts. Additionally, interactions in the digital space allowed Lisa and me to see students’ points of confusion as well as their developing understandings, and these real-time glimpses of learning allowed us to redesign in ways that responded to students’ needs faster across face-to-face and digital settings. However, a lesson that we took from the design cycles was the critical role that face-to-face talk played in mediating students’ developing conceptual knowledge. The digital played a role in the “crowdsourcing” approach that Lisa so enthusiastically embraced, but what our designs pointed to were the ways in which face-to-face and digital talk worked side by

side, each with unique affordances that supported progress toward the broad goal of conceptual knowledge in different ways.

## **CHAPTER 5: TALKING TO LEARN ACROSS FACE-TO-FACE AND DIGITAL SETTINGS IN A HIGH SCHOOL ENGLISH CLASSROOM**

I describe in this chapter the story of working side by side with an 11th grade English teacher, Peter, during our three-month design collaboration. In doing so, I address my third set of research questions: What kinds of learning opportunities are mediated by digital talk (the interactive communication via signs and symbols that occurs in online spaces between two or more participants) in a high school English classroom? What is involved in designing learning that is organized to support dialogic digital talk (digital talk that features teachers and students collectively building on each other's ideas and reciprocally sharing ideas in response to and anticipation of other ideas)? Over the course of two cycles of iterative design and reflection with Peter to shift digital talk practices, the following theories of learning emerged about digital talk in the classroom:

- Learning opportunities mediated by digital talk depend on how practices around it are socially organized.
- In order to support dialogic digital talk, organization of learning must account for the mutually influential nature of digital talk and face-to-face talk.

I share here the analyses that led to these conclusions. I organize the chapter in a manner parallel to Chapter 4, beginning with talk practices related to literary analysis in Period 1's face-to-face (classroom) and digital (Subtext) learning settings. Analyses of talk in these two activity systems provide a window into the broader, everyday ecology in which different talk tools mediated learning. They also provide a baseline by which to compare the results of the design work. Following analyses of talk in the two systems, I turn to my collaboration with Peter, showing how our iterative design cycles with the students in Period 1 helped us develop working theories about digital talk and learning.

### **Phase 1: Talk about Texts in the English 11 Face-to-face Activity System**

Like Lisa, Peter emphasized in our early Phase 1 conversations his desire to boost his students' learning through collaborative talk and to help them "feel confident in answering questions, in asking questions, and making statements in class [about texts]." Analyses of pre-design face-to-face literary talk opportunities, however, suggested the dominance of monologic approaches to teaching, where the teacher maintains close control of classroom talk and interpretation through activities such as lecture, seatwork, and known-answer question/answer sessions (Nystrand, 1997). Talk about texts was primarily organized to move students toward interpretations that Peter wanted the students to "get" via recitation talk patterns (the IRE sequence) (e.g., Mehan, 1979). Even though Peter incorporated dialogically oriented tool—such as open-ended questions, opportunities to connect and build to peers' ideas, and small group work—the overarching rules that organized talk about texts in the face-to-face setting established Peter as the primary source of information and "correct" interpretations, therefore minimizing or erasing potential dialogic opportunities. I provide in what follows two examples that illustrate

typical patterns in Period 1's whole class interactions around studied texts and, in doing so, the tension between Peter's goals with face-to-face talk activity and the actual implementation of face-to-face talk activity.

The first set of examples (Excerpts 5.1 and 5.2) comes from a discussion that Peter and his students had about the poems of Paul Laurence Dunbar at the start of my visits to Period 1. The Dunbar poems followed their reading of sections of *The Narrative of the Life of Frederick Douglass* and included "Sympathy" and "Frederick Douglass" (Appendix D). Although this conversation features strategies that are associated with dialogic teaching and therefore support Peter's expressed goals, a more monologic goal of arriving at a particular reading of these poems becomes the focus of the teacher talk.

Excerpt 5.1: Excerpt from class discussion about poem "Sympathy" by Paul Laurence Dunbar.

1	Peter (P)	I'm just gonna ask you this: he says, 'I know why the caged
2		bird does this and does this. So he's obviously comparing
3		himself to the caged bird. Why do you think he does this?
4	Caitlin	He's trapped.
5	P	Because he's trapped [writes "trapped" on the board]. Right?
6		And he's trapped and can't get to what?
7	Anthony	Freedom?
8	P	Ok, you COULD say freedom. Now, let's look at, I want to
9		point out the line here, there's one part that paints a really nice
10		pretty picture: 'When the sun is bright on the upland slope,
11		when the wind blows soft on the springing grass, and the river
12		floats like a sheet of glass, when the first bird sings and the
13		first bud opes, and the faint perfume from its challis steels.'
14		What picture is being painted here?
15	Patricia:	Spring?
16	P [snaps fingers]	Spring time. Awesome. The birth of new beauty, right? But
17		what happens to the caged bird?
18	Several students	It's inside a cage.
19	P	It's inside a cage. So it doesn't get to do all of these wonderful
20		things and enjoy all of this, right? It's being kept away, it's
21		being trapped [points to the word "trapped" on the board], and
22		kept away from all these wonderful things. It's like, 'Oh, that
23		looks great, and that looks great, and I'd love to do that, but I
24		can't.' How many of you remember Greek mythology from
25		freshman year? [students raise hands] Maybe you remember
26		the story of Tantalus?
27	Several students	Oh yeah!
28	P	What was Tantalus' punishment?
29	Aaron	I'm not really sure but was he the rock guy who had to carry
30		the rock up the hill and then he would fall and still have to
31		carry it? [sees Peter smile and shake his head] Oh, ok, never
32		mind, I guess not.

33 Laurel Wasn't he like in water or something and there was some food  
 34 over his head and he would go for it but he could never reach  
 35 it?  
 36 P Right! So he was always thirsty and hungry. And when he  
 37 tried to put his head down for water, the water would go  
 38 down, and when he tried to reach up and grab the fruit, the  
 39 same thing would happen, it would pull away. And that's how  
 40 this caged bird feels. Which, in turn, is how he feels.

This conversation begins with a seemingly dialogic move, an open-ended question. Peter asks his students, “Why do you think he does this?” as an invitation to share their ideas about why the speaker in the poem is comparing himself to the caged bird. However, because the class did not arrive at this comparison in a previous discussion, this question is grounded in Peter’s own interpretation (“so he’s obviously comparing himself to the caged bird”). The productive potential of this question therefore is circumscribed by the teacher’s presupposed understanding of the text. And as students offer their responses to this question, we see that this open question has a distinct answer that is revealed in known-answer exchanges. Peter validates Caitlin’s response (“He’s trapped”) by repeating and writing it on the whiteboard and then asks for the next “part” of the question: “he’s trapped and can’t get to what?” Anthony’s contribution does not get the same reception. Peter suggests that “freedom” is not out of the realm of possibilities, but his use of the conditional (“you COULD say that”) and immediate redirection to the text suggests that there is a more preferable answer waiting to be “unlocked.” Although Anthony’s comment could have opened a space for shared meaning making through elaboration, uptake, or other dialogic strategies (for example, what made Anthony suggest freedom as a possible interpretation?), Peter’s response serves to invalidate his idea.

Peter guides his students through the poem with more known-answer questions (lines 5-6, 12, 14-15), teacher-supplied interpretations (14, 17-20), and recall of knowledge that students acquired in another class (the Greek myth of Tantalus). The discussion of “Sympathy” ends with Peter revoicing Laurel’s response to his question about Tantalus and then linking that information to another supplied interpretation: “And that’s how this caged bird feels. Which, in turn, is how he [the speaker] feels.” Because this statement closes the discussion of “Sympathy” before the class turns to the poem “Frederick Douglass,” Peter provides the final response to his original question of “Why do you think he does this [the comparison between the bird and speaker]?” Throughout these interactions, he signals his agreement or disagreement with students’ responses by echoing their words (lines 14, 17, 39-41), offering praise (“Awesome,” “Right!”), and through movement (head shaking, snapping fingers). That the students position themselves as “not really sure” explicitly (line 32) or prosodically (utterance in form of question; lines 7, 13, 25-26) suggests they are aware that figuring out Peter’s reading of a text is an important rule governing these interactions.

The continued discussion as the class turns to “Frederick Douglass” provides another illustration (Excerpt 5.2) of how talk in Peter’s classroom ultimately discouraged talking to learn about texts among his students despite Peter’s pedagogical goals and the inclusion of dialogic strategies.

Excerpt 5.2: Excerpt from class discussion about poem “Frederick Douglass” by Paul Laurence Dunbar.

1 Peter (P) Now, this next poem -- he's actually talking to Frederick  
2 Douglass. Frederick Douglass has already passed away. But  
3 he's talking to Frederick Douglas, which actually, this word,  
4 which you look at and think of the punctuation, 'apostrophe,'  
5 but it can also be used when you are speaking to or addressing  
6 something that is not physically present. So especially  
7 someone who has passed away This is a form of apostrophe,  
8 he's speaking to someone that has passed. So, what's he asking  
9 Frederick Douglass? What's he telling him, saying to  
10 Frederick Douglass. I would think of one word. Yes? [calls on  
11 Connor with raised hand]  
12 Connor He has sympathy. He feels he can't do some stuff because of  
13 how people view him and his people.  
14 P It's a start.  
15 Connor Ok, ok, we can build off that, then.  
16 P There you go, let's build off that, let's build off what Connor  
17 said. So, what was Frederick Douglass -- what did he write  
18 for. The things he read, what did they give him? Yeah?  
19 (pointing to student AC)  
20 AC Freedom?  
21 P Freedom! Right? He was letting us know, this is what slavery  
22 is like. So he was fighting to abolish slavery. Did it happen?  
23 Students Yes.  
24 P Yeah, it did, right? So you could look at Frederick Douglass  
25 and say he was successful. So what might he be asking  
26 Frederick Douglass for now in these times for trouble?  
27 Eduardo For comfort or guidance?  
28 P Comfort or guidance. Awesome. Absolutely. Yes, comfort or  
29 guidance. 'Ah, Douglass, we have fallen on evil days.' Right  
30 there. 'Such days you didn't even know. So we need your  
31 help.' All right?

Peter provides some historical context (“he’s talking to Frederick Douglass”) and content knowledge (the concept of an apostrophe) before asking students “what’s [the speaker in the poem] telling [Frederick Douglass]?” On its own, this question is broad enough to generate a range of student responses. But Peter adds that there is “one word” he can think of that would suffice (lines 8-9), signaling the start of another journey toward a preferred response. This shapes the direction of the ensuing discussion, despite Connor’s suggestion that his classmates “build off of” his answer to Peter’s question. Although Connor and Peter both frame Connor’s response as “a start” that other students can add to, that dialogic opportunity is lost because the students are not presented with a chance to take up and build on Connor’s idea. Rather, Peter proceeds to his next question which is designed to give his students another way of thinking about his

original question (line 15-16). Through this sequence of Peter's known-answer questions, response evaluation, and supplied interpretations of the poem, students "connect the dots" until Eduardo arrives at the correct answer, which Peter indicates as correct with praise and repetition.

While whole class discussions such as the one above were the most common format for talking about texts in the face-to-face setting (I saw at least one whole class discussion during each of my Phase 1 visits), Peter included other instructional practices to support student talk in small groups. One such practice was known as "Money Quote." To start, Peter would write two or more categories on the whiteboard that varied depending on the text being studied. I observed this activity twice during Phase 1 and saw headers such as "characters," "characters' motivations," "stand up for beliefs," "culture," and "foreshadowing." Once categories were identified, students worked in their small groups to find "money quotes" in the text for each category ("money" being slang for high quality or excellent). With their iPads in front of them, students would search for quotations they believed related to one of the topics on the board. They would then share their choices with their group members and negotiate which single quotation, out of all their picks, fit the category best. One or two delegates from each group would write their group's selections for each topic on the whiteboard (Figure 5.1). After all groups had written their choices on the board, Peter would bring the entire class back together for a discussion about the text through the groups' quotations.

Peter had specific reasons for including small group work in discussion activities such as Money Quote. These were opportunities, he said, for students "to have meaningful discussions in their groups, [with the hope that] those meaningful discussions [would] give them the confidence to share those ideas in front of everyone." In light of this pedagogical goal, an ongoing source of frustration for Peter was how rarely students seemed to be in dialogue with one another at the whole class level. As he shared with me, "It seems like the same four or five people are doing all the talking [in whole group discussion]. There are some kids that just don't share ... they're in their little pods, and I do that on purpose because the whole think-pair-share thing, but they think when they are in pairs but they don't necessarily share with the larger group." Peter viewed small group work, in itself a dialogic participation structure, as an effective way to support "meaningful discussions" in partners and groups but felt at the level of whole group discussion that students relied on certain students to "carry the team."

Analysis of the Money Quote activity suggested that this practice did provide space for students to work collaboratively and talk about their interpretations in a small group setting, as Peter had intended. During the small group portion of the activity, which lasted eight to ten minutes, I saw students in the seven groups take on this activity in a variety of ways. Students organized note-taking, directed their group mates to their selected quotations in Subtext and read their quotations aloud, asked their group mates for help with searching for appropriate quotes, explained why their chosen quotations related to the topics, and sent delegates to the board to write quotations. As the groups worked, Peter walked around the classroom, assisting students who called on him for help with technical issues (on this particular day, many students were having difficulty seeing their classmates' postings and highlights in Subtext) and gauging students' progress by asking periodically how many groups were still working. This approach to small group work seemed to afford a participation structure that encouraged peer-to-peer interaction and idea sharing and placed Peter in a supporting role that literally displaced him from the front of the room.

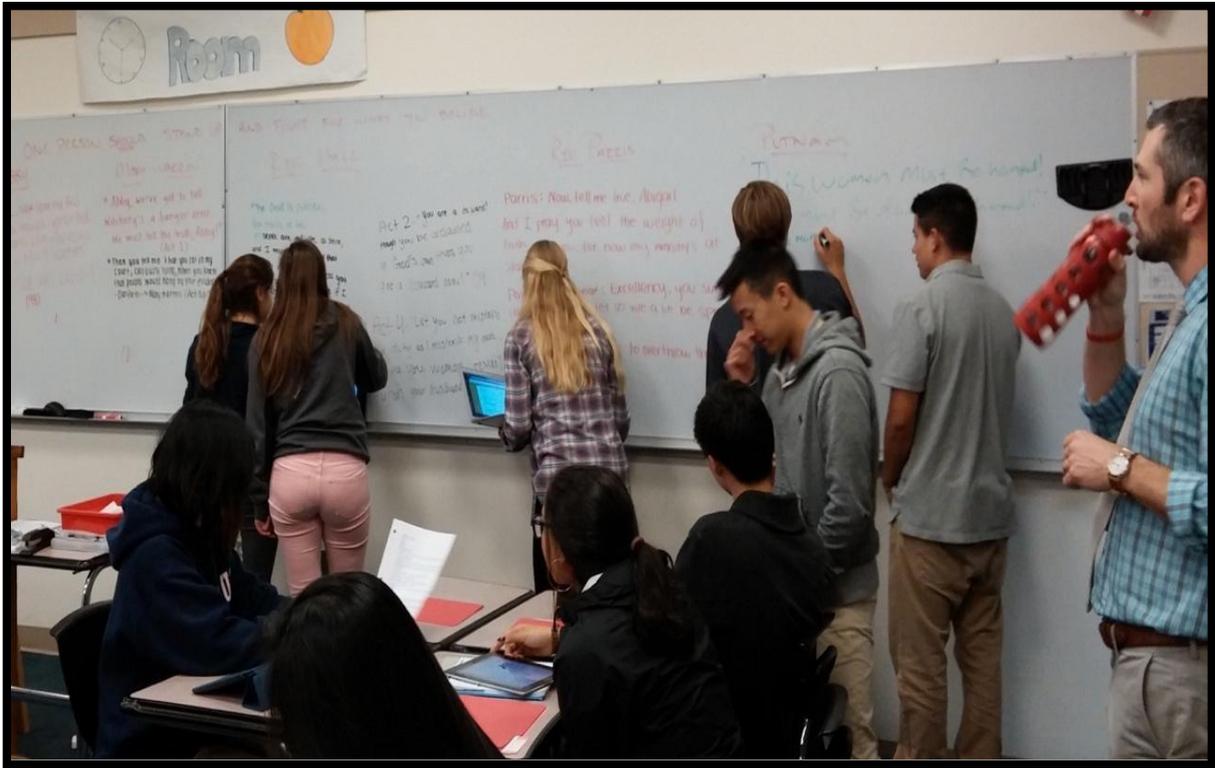


Figure 5.1: Period 1 students sharing Money Quotes that they selected in their small groups.

However, as the following example from the discussion of Kate Chopin’s story “Desiree’s Baby” illustrates (Excerpt 5.3), once Peter shifted students from small group to whole class interaction, the dominant talk patterns were teacher lecture (presentation of information or explanation of a concept) and known-answer questions. In this example, the whiteboard topics are “Culture” and “Foreshadowing.” For their homework the night before, students had read the Chopin story in Subtext and highlighted sections of the text that represented their understandings of foreshadowing and culture. They also had written a short response in Canvas to what Peter called a Show You Know (SYK) question: “What do we know about Desiree’s background and family history that is important?”<sup>31</sup> The excerpt begins after the students have finished writing their quotations on the board, as Peter is turning his students’ attention to the whiteboard to look at the selected quotations.

Excerpt 5.3: Excerpt from class discussion about the short story “Desiree’s Baby” by Kate Chopin.

- |                                      |   |
|--------------------------------------|---|
| <p>1 Peter (P)<br/>2<br/>3<br/>4</p> | <p>We have to understand the world Desiree lives in before we can understand her actions. So, we have some good quotes up here. I'm gonna start here [pointing to a quotation under “Culture”]. He says, 'What did it matter about a name, when</p> |
|--------------------------------------|---|

<sup>31</sup> Peter assigned SYK questions periodically to assess students’ comprehension of a given text.

5 he could give her one of the oldest and proudest in Louisiana.'

6 So Armand's family is one of the oldest and proudest in

7 Louisiana. Wealthy, have a plantation, he has servants, he has

8 slaves, he has land. And it also shows the importance of a

9 name, your family name. Now the other part of [the quotation]

10 gives us information we need to remember the whole time we

11 read. Why is he saying, 'it doesn't matter about hers.' What do

12 we know about her name that makes him say that? What do

13 we know about her background? What's strange about

14 Desiree?

15 Chris She was like dropped off, she doesn't really have--

16 P --she was found on the porch.

17 Chris Yeah.

18 P Yeah. The mother that raised her found her on her doorstep.

19 And she kept her and she raised her as her own. Desiree does

20 not know her parents. So when he says name, not necessarily

21 just her last name -- she comes from an okay family -- but it's

22 also the fact that they don't know her line, right? Is she of

23 'good stock,' they might say. This is where we understand the

24 culture of the time and place. He's of good stock, "oldest,

25 proudest family in Louisiana." He can't go mixing with

26 someone of not proper breeding. But he does anyway. He

27 decides it's ok because, 'My name is so great. It doesn't matter

28 what hers is, it'll be fine.' So we set that up. The importance of

29 the name. The family, the breeding. Great.

30 [Gesturing to the next quote on the board] Now, before we get

31 to this one, something about him: 'Armand is the proudest

32 father in the parish I believe, chiefly because it is a boy to

33 bear his name.' It's all about the name, the family name. Great.

34 The interesting thing, though, do you remember: what was

35 Armand like as an owner and master of his plantation when he

36 first married Desiree? What's he like? How does he treat his

37 slaves and servants?

38 Keith Very nice to all of them.

39 P Way nicer than after what?

40 Keith After the baby was born.

41 P After the baby was born. Before the baby was born, he abused

42 them, he was a tyrant. Then the baby boy is born who can

43 carry on his name and fills him with love. Changes his life. So

44 much so that it actually changes his mood, changes the way he

45 treats his slaves and servants, and runs the whole place.

46 Changes the way he treats Desiree. BUT, then all of a sudden,

47 they find out what? What do they discover?

48 Marisol The baby is black.

49 P Yes, the baby is part black. Now here's the thing, though—  
50 you may not have even noticed in the story—is Armand starts  
51 to change back to being that tyrant. Before Desiree makes the  
52 connection with her baby. So what does that tell us about  
53 Armand? [silence from students]  
54 He figured it out first, he knew before she did, he started  
55 noticing it before. And he didn't know what to do.  
56 How did Desiree notice it? This was one of your Show You  
57 Know (embedded in Subtext) questions. Yeah (calls on  
58 Aaron).

59 Aaron The quadroon boy. He's fanning her baby and I think she  
60 notices that they look the same color.

61 P The skin tone. Yeah, she notices the skin tone. She notices the  
62 similarity [reads student quotation from the board]. "Almighty  
63 God had dealt cruelly and unjustly with him; and felt,  
64 somehow, that he was paying Him back in kind when he  
65 stabbed thus into his wife's soul. Moreover he no longer loved  
66 her, because of the unconscious injury she had brought upon  
67 his home and his name." So what does the fact that his child  
68 might be part black, what does that do to his name?  
69 Luis Brings dishonor?

70 P Yes, it stains his name. He can't have that. Once again, shows  
71 you the time period, the culture and the feelings of the time.

Even a fleeting glance at the transcript reveals who spoke the most about the students' "money quotes." Although Peter told me in an informal conversation that he was pleased with the collective efforts he was seeing in the small groups, the marked difference in how talk practices were organized in the small group and whole class segments of the Money Quote activity suggests that Peter and the students understood these as different "talk zones" in the learning ecology. As we see in this excerpt, Peter opens the discussion by focusing students' attention on understanding the culture, or what he refers to as "the world," in which the character Desiree lives. He quickly evaluates the quotations on the board ("we have some good quotes up here") and begins to explicate them. As Peter reads through the quotations, he moves between offering information about characters' histories (lines 4-7, 15-19) and relating the quotations to the stated broader goal of "[understanding] the world Desiree lives in before we can understand her actions" (lines 7-9, 19, 21-23, 26-27, 57-58).

Peter invites student voices into the conversation at several points by asking known-answer questions that focus on plot points (lines 9-11, 27-29, 31, 37-38, 42-43, 46, 54-55). Follow-up questions probe for displays of more plot-related detail (lines 29-32). For example, he asks Keith to provide details that contextualize the character Armand's behavior before the birth of his child (lines 29-31). As Keith responds, Peter revoices/repeats Keith's words (e.g., "Way nicer than after what?" "After the baby was born"), which is seen as a dialogic move. However, the purpose of this revoicing is to acknowledge Keith's "right track" answers and probe for more details. Peter's questions focus on what the text "shows" and "gives," precluding opportunities for students to co-construct knowledge and suggesting, to the contrary, that there is a static

meaning to be extracted from the text. When students lack a response to one of his questions (“So what does that tell us about Armand?”), Peter provides the answer (“He figured it out first, he knew before she did, he started noticing it before. And he didn't know what to do.”) so that students receive the “correct” information before he moves on to his next question (“How did Desiree notice it?”). Similarly, Peter does the work of connecting students’ quotations, the sociocultural context depicted in the short story, and the characters’ actions—connections that he had asked the students to make in their small groups. Rather than turning the question of “What do we know about Desiree’s world and how?” to the students, Peter propels his students through the story with comprehension check questions and lecture, emphasizing where the text “shows you the time period, the culture and the feelings of the time.”

While student voices were not absent from this conversation, it was clear the rules for participation were quite different in this space. Groups were not called on to read their selections or to explain why they selected them, nor did students volunteer to read or explain their quotations as they did in their small groups. Although Peter hoped that the collaboration and sharing that were more visible during small group work would transfer to whole group discussions, different rules and distribution of tasks and knowledge governed these practices. In this and the other observed instance of the Money Quote activity, cooperative student talk came to a halt after the small group work. Once written on the board, the student quotations seemed to have passed into the domain of teacher talk. There seemed to be a tacit understanding that small group work was “zoned” for student talk while whole class discussion was a space for teacher instruction about texts and evaluation of students’ textual knowledge.

Taken as a whole, the talk practices that I observed in the face-to-face setting were organized in ways that supported a monologic approach to whole-class teaching. Moments in conversations that had dialogic potential were often lost as Peter guided his students to his predetermined understandings that were “collected” through questions and lecture. While students’ voices were present and student interaction came to the fore at times, as I saw during small group work in the Money Quote activity, literary discussion practices seemed to be shaped by rules and division of labor that supported Peter as the “knower” with the key to the meanings of the texts. Although Peter routinely asked if students had additional comments or questions before moving to another topic, this invitation seemed perfunctory as the “wait time” for questions was usually less than three seconds. The learning mediated by whole class discussion contradicted the collaborative experience that Peter envisioned and attempted to design for his students.

## **Phase 2: Designing for Dialogic Digital Talk about Class Texts**

### **Phase 2 Baseline Assessment: Talk about Texts in the Digital Activity System**

At the end of Phase 1, Peter and I agreed to move forward with exploring digital talk practices. As a first step in our collaboration, he and I examined digital talk inside his classroom texts as a baseline for our design work. We decided to look at digital talk threads from the two most recent novels that Period 1 had read, *The Adventures of Huckleberry Finn* and *The Scarlet Letter*, to get a sense of what digital talk in Period 1 looked like.

Analysis of pre-design digital talk (63 digital talk threads in the two novels) suggested that despite Peter’s intentions to provide dialogic opportunities for his students in their e-texts,

the discursive practices around digital talk undermined those good intentions. All of the pre-design digital talk threads revealed students and teacher engaging digital talk in recitation patterns, where the authoritative voice of the teacher poses questions and students answer without connecting to and building on other speakers' ideas. Peter posed the questions, which most often took the form of known-answer or "test" questions. The following examples of digital talk from *The Adventures of Huckleberry Finn* provide representative illustrations of the kinds of exchanges we observed in several dozen discussion threads across the two novels.

To start this discussion thread (Figure 5.2), Peter poses a question to his students: "What does it mean to be "respectable"? (This is what "s"ivilized is)." Students respond to his question in a variety of ways, offering definitions such as "To not be different but to be exactly how everyone else acts," "It means to be good at what they do," "It means to live in a house, to wear decent clothes, to go to school," "To learn something new and try to be normal," "To be 'respectable' means to be well-mannered, educated, and humane," "Respectable means something society considers proper or correct," and "It means to be civilized and genuine." Many of these responses have in common notions of social conformity and consideration of others. Other responses suggest that respectability is related to displays of education, learning, and politeness.

In this exchange, the digital talk practices organize a particular kind of learning experience. Peter asks students to provide a specific definition of "respectable," as he indexes with his parenthetical hint: "This is what "s"ivilized is." If this interaction had worked as Peter initially intended, we would see the students' interacting with each other as well as with Peter through their digital talk. Figure 5.3 traces a few imagined interactive pathways that might suggest more dialogic orientations toward classroom talk in Subtext. Instead, what we see are students responding directly to Peter rather than to the many other speakers participating in this discursive space, whose responses they can also see (Figure 5.4).<sup>32</sup> Peter asks for a definition, and each student complies as if she or he were being called upon. While "respectable" can mean many different things, the parenthetical hint combined with the similarity in students' responses suggest that there is a particular meaning associated with this word among the class community. Peter's question seems designed to elicit from the students their knowledge of that meaning, and the content and unidirectionality of responses suggest that the students perceive the demonstration of their knowledge as the purpose of this exercise. This participation structure, illustrated here and evident in the other pre-design digital talk threads in *Huckleberry Finn* and *The Scarlet Letter*, creates a sense of "hand raising" in the digital setting that is reminiscent of the IRE (initiation-response-evaluation) pattern. In typical recitation format in classroom settings, teachers look for brief, "correct" answers so that they can move on to the next question. As this thread suggests, this interactional pattern can thrive in the digital setting as well.

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<sup>32</sup> Peter did not use the cloaking feature that Lisa used.

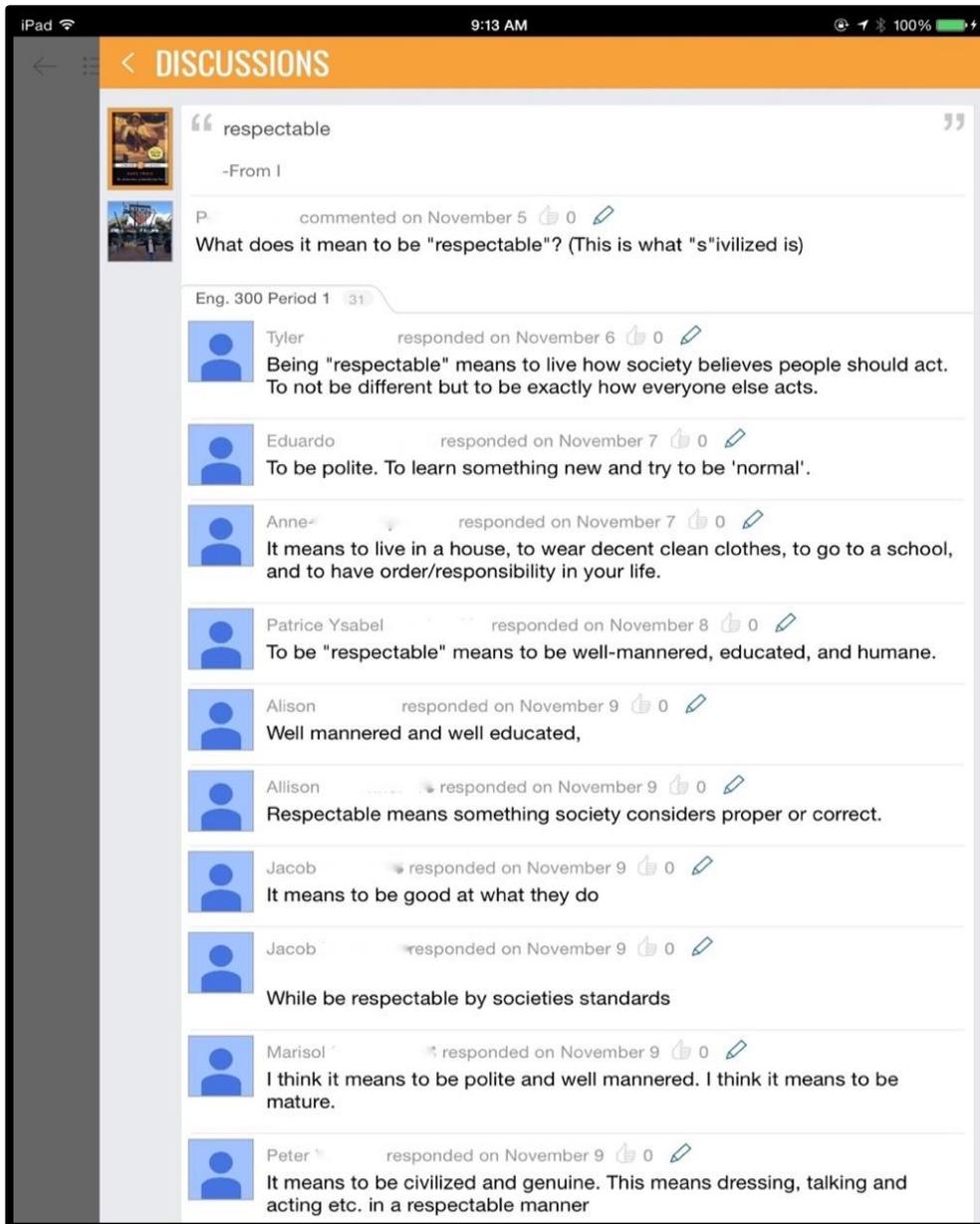


Figure 5.2: Digital talk excerpt #1 from *The Adventures of Huckleberry Finn*.

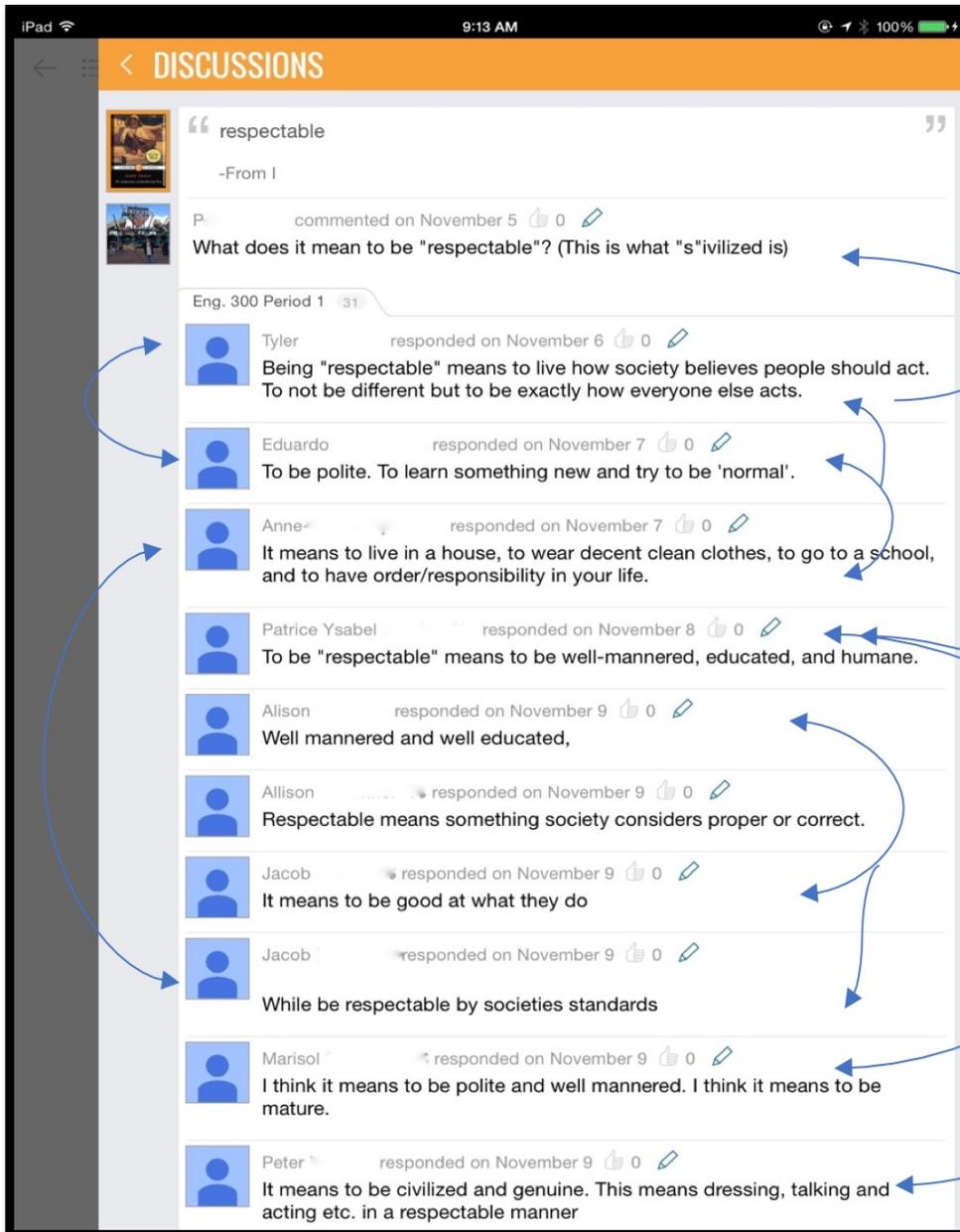


Figure 5.3: Example of possible dialogic pathways among talk participants.

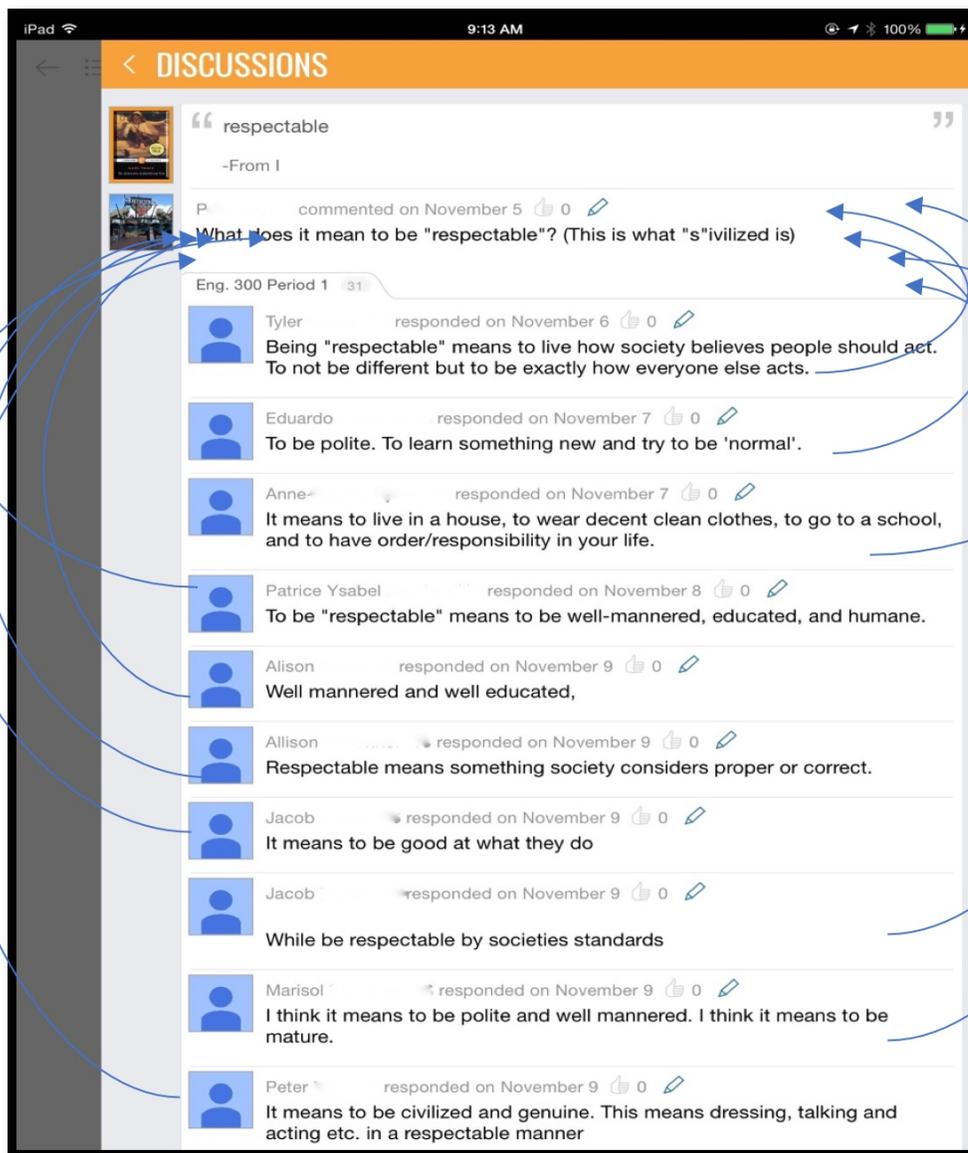


Figure 5.4: Actual talk pathways among Peter and his students.

The social organization of digital talk practices resulted in digital talk mediating a learning experience that was opposite of what Peter hoped to facilitate. In discussing his objectives related to Subtext use with his students, Peter spoke of his desire to use digital talk as a tool to support collaborative learning through the sharing of different ideas and perspectives. Indeed, this thread shows that, despite the expected similarities across many of the responses, there also are variations that could have acted as a springboard for shared meaning making through elaboration, probing through uptake, posing new questions, or other dialogic strategies. For example, why does Eduardo think respectable means being willing “to learn something new

and to try to be ‘normal’”? What makes Marisol define respectability as being mature? Why does Jacob believe that being respectable is being “good at what they do” (and who is “they”)? These variations, however, did not generate further commentary and exploration from students or from Peter.

Even when Peter posed questions that invited more variability in responses, the interactional patterns remained unchanged (Figure 5.5). In this next example from a talk thread in *Huckleberry Finn*, Peter asks students to share their thoughts about the character of Huck

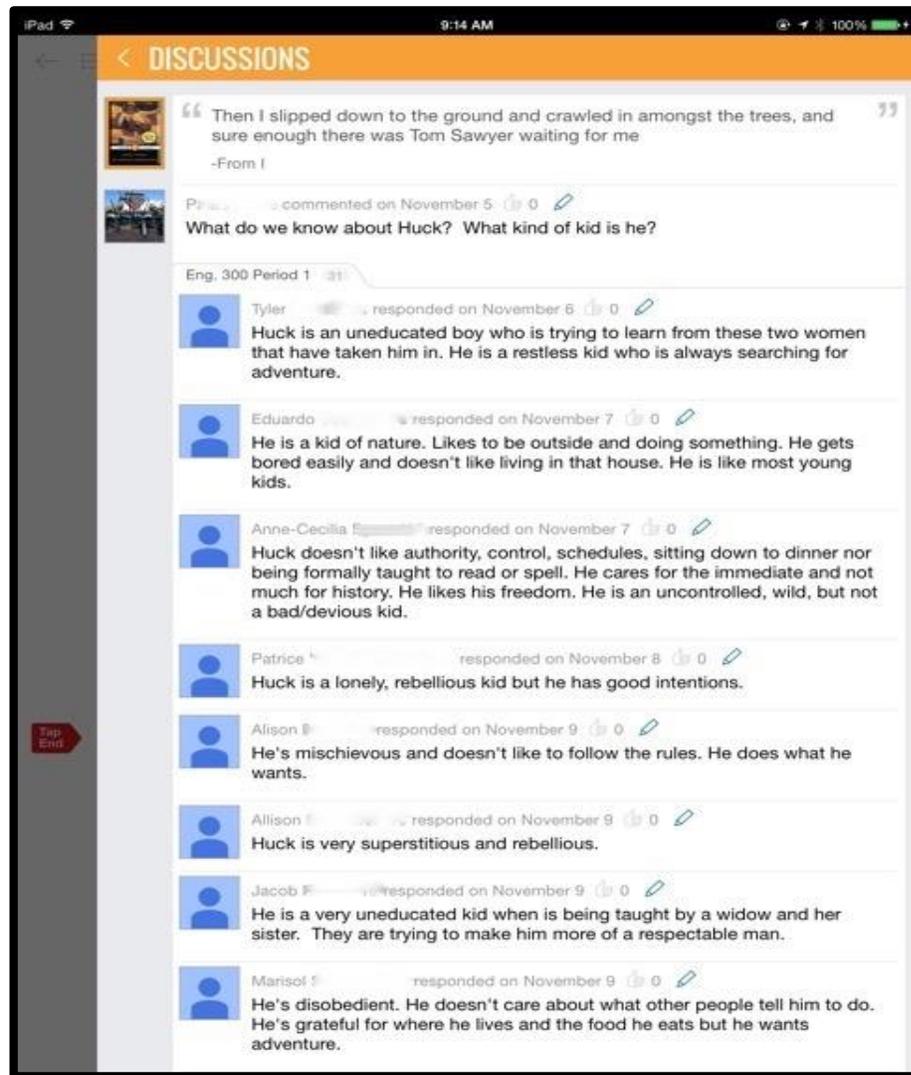


Figure 5.5: Digital talk excerpt #2 from *The Adventures of Huckleberry Finn*.

(“What kind of kid is he?”). At first glance, this discussion thread may appear to be more representative of the kinds of exchanges that Peter had in mind. Students share their own ideas about Huck, offering a range of perspectives: he is, for example, “lonely,” “rebellious,”

“restless,” “uneducated,” “superstitious,” “disobedient,” “grateful,” “like most young kids,” and “not bad/devious.” Although Peter’s question is anchored in a particular passage about Huck and Tom, the students’ responses suggest broader, more cumulative understandings of Huck’s complexity as a character that they have developed over the course of the novel. We see in this excerpt students making connections to information learned in other sections of the text (e.g., Huck’s superstitious tendencies), text-to-world connections (Huck is “like most young kids”), and even perhaps echoes of past digital and face-to-face conversations (Jacob mentions respectability, a concept from a different thread). A number of the responses appear quite robust, particularly when compared to the brief, test-answer responses that characterized many of the digital thread interactions. However, focusing on interactional patterns reveals that the digital talk does not meet Peter’s dialogic objectives. Peter’s is still the only voice deciding which question to pose, and the ensuing responses are once again all directed at Peter.

Witnessing the IRE participant structure in a classroom learning space is not a surprise as the research literature has long shown it to be the default mode of participation in many face-to-face interactions in classrooms (e.g., Alexander, 2008; Mehan, 1979; Nystrand, 1997). When teachers ask known-answer or “test” questions in the face-to-face space, they get test-answer questions back. Analysis of digital talk in Peter’s class suggested that known-answer questions in the digital space produce similar interactions.

What the pre-design digital talk data affirms, however, is that the digital does not inherently afford “an alternate reality” to business as usual, and that the tool of digital talk does not guarantee different or new practices. In fact, we might ask which approach supports students better: IRE in face-to-face settings or IR and no E in digital spaces? Peter very rarely responded to his students’ digital talk, citing time as a major issue. Thus, there would be streams of responses to Peter’s questions and no evaluation—from Peter or from other students.

### **Design Cycle 1: Changing the Rules and Tasks of the Digital Activity System**

**What we did.** Reviewing the pre-design digital talk threads gave Peter and me a starting point for shifting practices in support of dialogic digital talk. As a design resource, I brought in *Inspiring Dialogue: Talking to Learn in the English Classroom*, a practitioner-oriented text by Mary Juzwik and colleagues (2013) that provides English teachers with research-grounded and classroom-tested tools for fostering dialogic practices. Peter valued discussion-based, collaborative approaches to learning but was not familiar with the research on dialogic teaching nor the wide variety of available dialogic tools, so this book proved to be a particularly useful resource throughout our design work.

Peter and I agreed that the digital talk data (and his experiences with other digital talk threads with Period 1) told a pretty clear story: he had the most prominent position in the digital space as question-poser and as the intended audience of students’ responses. In reflecting on these patterns, Peter attributed these interactional patterns to a lack of explicit expectations related to discussion and to the form of the questions asked. He said,

I think it’s because of the way I introduced [Subtext discussion], and the way that some of the questions were posed. The directions I gave [to respond to his questions], it made it seem more quiz-like. So they were locked in and they thought, ‘I have to complete this.’” And that’s what I would definitely change for next time. I probably would introduce it

differently. Make [questions] more collaborative, for the whole class.

He added that he had not felt much of a need to lay groundwork with discussion at the beginning of the year with his 11<sup>th</sup> graders because almost all of them came from English 10 teachers who often used fishbowl discussions and Socratic seminars. He therefore assumed that “the students [came in] kind of used to the idea [of discussion]” and that the students who were choosing not to participate were relying on a small number of “regular talkers.”

Building on Peter’s ideas for improvement via explicit expectations and different question types, we decided to design new question opportunities for two short stories by Anzia Yezierska, “The Lost Beautifulness” and “Soap and Water.” We wondered if open-ended questions from Peter and opportunities for students to make visible their own questions and meaning making would foster more dialogic exchanges in Subtext. To this end, Peter embedded three open-ended questions in each story that invited students to offer their understandings (Table 5.1).

Table 5.1: Open-ended questions posed by Peter in the Yezierska short stories.

Short Story Title	Open-ended Questions
“The Lost Beautifulness”	<p>Why do you think Hanneh invites everyone to see the kitchen?</p> <p>Would you have taken the money from Mrs. Preston?</p> <p>What do you think will happen when her son returns?</p>
“Soap and Water”	<p>Why do you think she’s unable to keep up an “acceptable appearance”?</p> <p>What do you think about her schedule? Is it worth it?</p> <p>What do you think made her begin holding her head up high?</p>

We hoped these questions, which were significantly different from those that students had previously engaged in their digital discussions, would encourage the sharing of different perspectives. To further dialogically orient digital talk, we also asked students to demonstrate how they were making meaning of the story by highlighting at least two sections in each short story and posing questions or making comments about those sections. Comments were expected to be more than two sentences, and students were encouraged to link their points to life experiences, other class texts, and/or information learned in other disciplines. We assumed that asking students to share their personal connections to texts and reading their classmates’ personal connections would encourage students to respond to one another and engage in digital talk about the texts. To create less impetus for students to “lock in” on grades, Peter decided to leave out

mention of assessing students' posts: "They're very points-driven ... It's like, my grades, my points. As soon as I say I'm giving points or collecting [an assignment], it's like, 'I just have to finish this.' And that's not how I intend it to be." He hoped that less focus on grading with this new approach to digital talk would help his students engage in discussion with their peers more naturally and lead to "more questions [posted by students] that would spark more [discussion] as a whole class."

Our design rationale was that changing digital talk opportunities in these ways might foster dialogic digital talk among students. Our designs changed the established rules and norms of digital talk in Peter's class. As patterns across the pre-design digital discussion data suggested, digital talk practices in the Period 1 community had developed over the fall semester in ways that supported "quiz response" interactions between Peter and an individual student. According to these established rules, digital talk took the form of teacher-posed, known-answer questions and strings of student responses back to the teacher. By having Peter pose open-ended questions that invited students' opinions and also ask students to share their questions and ways of making textual meaning, we hoped to introduce new interactional rules to the community. These designs, which aimed to invite students' authentic dialogue through the sharing of personal connections to a text, also attempted to shift power dynamics by distributing the work of talk among all classroom participants. We wondered if these adjustments in the digital learning setting would influence tool use (digital talk) and therefore student participation.

**What we learned.** What we found in looking at the digital talk activity in the first short story, "Soap and Water," was that these adjustments were not sufficient to encourage dialogic digital talk participation. Unlike with Peter's known answer questions, to which students provided answers, students did not respond to Peter's authentic questions and only eight students posed questions or comments of their own. No students responded to those students' postings. All 27 students highlighted at least two sections of the story, and 12 students highlighted more than two sections. Digital talk, dialogic or non, came to a standstill in the pages of this story. And as a significant portion of Period 1's text discussion activity for the Yezierska short stories was supposed to happen in Subtext,<sup>33</sup> this meant that talk about texts came to a near standstill.

With the second story, "The Lost Beautifulness," we also found that all students highlighted the required two passages and 13 students highlighted more than two sections. What stood out as we skimmed the pages of the story before class was the absence of any student posts. This digital silence, we found out when Peter asked the students in class, was partly due to a technical glitch. Several students said they had posted questions or comments in "The Lost Beautifulness" to go with their highlighted passages, but those posts had not been saved in the app. However, because technical malfunction had not been the issue behind the lack of activity in "Soap and Water," Peter and I viewed the technical issue as a significant challenge but not the cause for what appeared to be a failed design iteration.

Changing the types of question and comment opportunities appeared to have negatively impacted digital talk. Peter and I were surprised by this turn of events as well as disappointed. He summed up our feelings and assumptions during a team meeting: "My thought was that if we changed [the questions] and it was done there [in Subtext], then their discussions would change, but it hasn't shown up that way. So that's where it needs to go." Even accounting for the

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<sup>33</sup> A good portion of the face-to-face class sessions were dedicated to an essay assignment when the Yezierska stories were assigned.

technical glitch that had erased several student postings, students had participated less when offered open-ended teacher questions and student-posed questions and comments than when they had been offered known-answer questions in other texts. Rather than opening up dialogic opportunities in the digital activity system, changing the rules and tasks seemed to have discouraged overall participation in digital talk. On the other hand, we noticed that highlighting was not negatively affected; in fact, a number of students exceeded the assignment's requirement for highlighting passages in both stories. Peter commented that this point of consistency made sense because "it's what they're used to doing and it's easy." That this familiar task was taken up by students while the new talk tasks were given very little attention suggested that adjusting for who was doing the talking and how—the rules and the division of labor around digital talk—was not sufficient to "override" the students' understandings of norms and tasks in the digital activity system.

## **Design Cycle 2: Changing the Rules and Tasks of the Face-to-face Activity System**

**What we did.** As our attempt to shift practices in the digital setting had not moved us closer to our objective of dialogic digital talk, we turned our attention to the broader classroom ecology. We wondered if the students' lack of dialogic participation in the digital space related to behaviors and practices in the face-to-face setting. During our reflection and design meeting, Peter noted that students' reluctance to engage in discussion "could be related to the environment." When I asked him what he meant, he explained that "because there are smart kids [in class] ... some kids are reluctant to share because of comparison and fear of not looking smart." He believed this fear also played a part in the "points-driven behavior" that he had mentioned to me before. He was quite frustrated by his students' lack of engagement with the Yeziarska short stories and attributed their behavior to his original decision to deemphasize assessment of students' posts:

It has to be for points—it *has* to be for points ... It's the only, only way ... And really, it's one of those things where, as the teacher, if you're gonna take the time to try and come up with something, you know, that works ... It's like, that's what makes me upset ... It's not necessarily "You don't do your work, you disrespected me." No, it's the fact that I put this effort in, and then we can't even [have a discussion] because you aren't doing the assignment ...

Peter believed that not being clear about how he would assess the digital talk assignment had given his students the impression that they did not have to invest much effort. This lack of specificity combined with students' fear of "not looking smart" had, he believed, undermined our design. He suggested that we take a closer look at how students would be "held accountable for doing their work" in the next design iteration in order to address participation issues.

As a former classroom teacher I understood Peter's frustration, but I also wanted to guard against implementing a design that could inadvertently perpetuate a narrow focus on points and place the responsibility of generative classroom talk solely on students. I shared Peter's interest in the relation between digital talk and the classroom ecology, but I wondered if we would have a better chance of shifting talk by addressing the ways in which talk was organized in the face-to-face setting. To strike a middle path, I asked Peter if there was a way to address accountability

through additional talk supports, given that some students might not have much experience with dialogic literary talk in either face-to-face or digital settings. Although skeptical that his students would abandon “their obsession with their grades and how they’re graded,” Peter said he was willing to invest some face-to-face classroom instructional time to experiment with new practices and/or tools to support dialogue. I saw this as a sign of his commitment to change-through-design—despite his frustration—because a shortage of instructional time was a constraint that he mentioned regularly in our conversations.

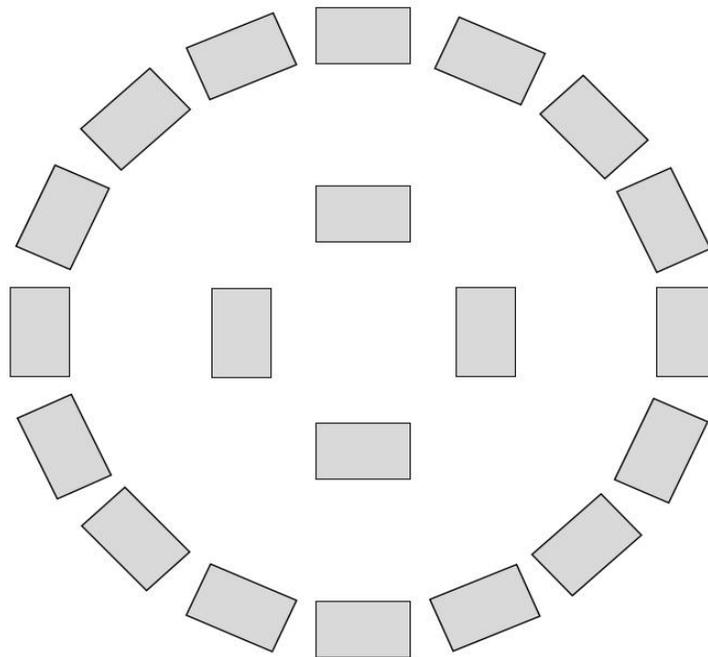


Figure 5.6: Sample fishbowl set-up with inner and outer circles.

Guided by this goal of shifting practices by focusing on supports provided in the face-to-face setting, Peter and I took another look at a variety of research-grounded student-led and teacher-led dialogic tools to use with Richard Wright’s *Native Son*, the next class text. In the end, we decided to introduce a student-led tool, the fishbowl discussion, and a teacher-led tool, dialogic language stems, to support students’ talk-in-interaction about Wright’s novel (Juzwik et al., 2013). The fishbowl discussion is a teaching strategy that lets students practice being leaders of and listeners in discussions. It is a highly adaptable activity, but the basic premise is that one group of students sits in the inner “fishbowl” circle, presenting ideas, questions, and comments, while another group sitting in the outer circle listens to these ideas and, depending on how the discussion is being facilitated, responds to them (Figure 5.6; see also [facinghistory.org](http://facinghistory.org) for a detailed procedural explanation). Although Peter had not received training in facilitating discussion in his teacher education program, he said he was willing to try the fishbowl approach because he had had the opportunity to see one of his colleagues use it with her English 11 students. He had been impressed with her students’ participation and the way she had conducted

“live” assessments with a discussion rubric:

So Jane does fishbowls all the time ... In her [teacher] training, fishbowl was a big thing. For me, it wasn't ... I am not as familiar with it. I've seen her sit up here, she scores them as they talk. There is a rubric where she scores with 0, 3, or 5 depending on their contribution. I actually observed her because you have to observe a colleague once a year and submit an observation to [the principal] so I observed Jane ... And her class was great as far as discussion goes, so I kind of jumped on that.

Peter's words suggest that he found this particular approach to discussion approachable because he had already seen it modeled by his colleague with her students. He also noted that this discussion strategy was appealing because “it [felt] very authentic” to his teaching practice. This was not the case with other dialogic tools we looked at, such as teacher tokens (i.e., calling on students to speak by selecting names from a jar) and drama activities (e.g., collaborative role play), which he rejected because they were “just not me—very not me.”

The other discussion tool we decided to introduce was a set of dialogic language stems created by Juzwik and colleagues for classroom use.<sup>34</sup> The language stem reference sheet we printed to distribute to the students (Appendix G) names and defines 13 dialogic strategies (elaborating, clarifying, reinforcing/supporting, challenging, conjecturing, requesting clarification, admitting difficulty, initiating, paraphrasing, summarizing, defining, noting relationships among tasks and texts, and activating background knowledge). It also provides examples of sentence-starters for each of the strategies. These stems are meant to support students who are learning what it means to contribute to class dialogue.

We wondered if these additional mediating tools in the face-to-face learning environment, which positioned students as discussion leaders and equipped them with relevant linguistic moves, would shift how students participated in class learning spaces. To transition students into using the stems with Book 1 of *Native Son*, which the students would be assigned to read over spring break, we decided that Peter would review the stems with Period 1 and instruct students to use least two strategies and engage at least one classmate as they read Book 1. To further center students' talk, we also decided that Peter would not pose questions in Subtext.

Peter introduced the stems at the next class as part of his introduction to *Native Son*, which took place on the last day before spring break. After presenting a 1941 photo-essay of Chicago's South Side to provide some social and cultural context for the novel, he gave each student a copy of the dialogic stems, which he described as “tools to help you get started on how to create a proper question or comment.” As he discussed the different strategies, moving briskly through the definitions and the example phrases, he noted that the stems would “help activate [students'] ideas” and help them interact with others' ideas. In particular, he hoped that the stems would help “those worried about how to get started” because they could “actually use these words [the examples] to begin [their] phrases.”

As he turned to explain how students would use the stems as they read the novel, Peter focused on a familiar reading practice, text highlighting, and the ways in which students would

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<sup>34</sup> The “How Can I Contribute” language stems handout can be found at the companion website for *Inspiring Dialogue*:  
[http://vbrr.wiki.educ.msu.edu/file/view/How\\_can\\_I\\_contribute.pdf/462578212/How\\_can\\_I\\_contribute.pdf](http://vbrr.wiki.educ.msu.edu/file/view/How_can_I_contribute.pdf/462578212/How_can_I_contribute.pdf)

build on highlighting to initiate and engage in discussions with their peers:

You're gonna choose your own highlighted passages, something you highlighted, and you're gonna expand on it. You're gonna pose a question from it. Maybe you highlighted because it made you question something, or you're gonna comment on it using any of the beginnings from this table [the dialogic stems guide] to help you out, to lead you. All right? When everybody's done with that, we're gonna go back again, and you're gonna find someone else's, a classmate's, and you're gonna comment on theirs, all right? So you're always gonna [post a comment] for yourself and one for another.

The assignment was similar to what students had been asked to do with the Yeziarska short stories (highlight text, pose questions, respond to peers) yet also quite different due to the addition of the language stems. With the short stories, students had been assigned to comment and pose questions, but the only explicit guidance they had received was about the number of sentences required in a comment. What engaging in dialogue with other readers looked like had not been specified. With *Native Son*, in contrast, Peter encouraged students to use the provided examples of dialogic phrases as participation templates. He also linked this redesigned approach to dialogue with future learning activities, noting that each small group would be responsible for helping classmates learn more about various topics in the novel. Without providing specific details of the fishbowl activity, he emphasized that students would be expected to participate in significantly different ways when their class met again after spring break:

I don't want just a summary of what happened, I want to know why [highlighted passages are] important. And you can tell us why those are important. I'm looking to you to help us get the information we need, all right. So you guys gotta lead it. You don't -- if we don't get to it, if we can't get to it, then you got to find it on your own. This is yours, this is *your* novel. This is *your* unit.

In our post-class reflection, Peter said that he hoped that he had made clear the *Native Son* discussions would be student-led and that the additional support provided by the language stems would change how students approached talk in the digital space. Further, he hoped that informing students of new participation expectations in the face-to-face setting (i.e., teaching their peers) would motivate more thoughtful participation in Subtext as they read Book 1 of the novel over spring break.

**What we learned.** As Peter said at the start of our collaboration, his original belief was that Subtext and its communicative affordances would promote dialogic exchange. What was most insightful, then, about our analysis of data from Cycle 2 was how the additional mediating tools in the face-to-face setting—the fishbowl discussion and the dialogic stems—shifted talk in both digital and face-to-face settings.

As we looked at students' comments in Subtext, Peter and I agreed that digital interactions after the introduction of dialogic stems looked different from the pre-design digital talk and certainly different from the digital interactions we saw around the short stories. Analysis of digital talk in Book 1 of *Native Son* revealed discursive moves that reflected a number of the strategies from the dialogic language stems sheet. As Table 5.2 illustrates, the most popular dialogic moves were reinforcing (agreeing with a classmate's idea), elaborating (extending a

previous comment or question by adding further detail), and conjecturing (trying out a line of reasoning). The students replicated or otherwise closely followed the discussion phrases provided. For example, students who used elaboration moves the (nine instances) replicated the provided phrase “I want to add to the comment” or used variations such as “To add to your comment” and “Adding to what you said.” Students who used reinforcing/supporting moves (17 instances) used language of concurrence, beginning their comments with phrases such as “I agree with” (as provided on the handout), “I think you’re right because,” and “What you highlighted is interesting to me because.” Students who used conjecturing moves (11 instances) reflected language of exploration and possibility, including phrases such as “Maybe it’s because” (“maybe” being one of the examples given) “I wonder if,” and “It’s possible that.”

Additionally, students used stems to admit difficulty (seven instances) and note relationships between the text and other learning experiences (four instances). The language in these posts echoed the examples provided on the strategies handout. Students admitting difficulty used phrases such as “I don’t understand,” “I don’t get,” “I’m trying to figure out,” “So does this mean that.” The fact that some students chose to engage their peers by their sharing questions about the reading suggests that framing a point of confusion as a valued discussion contribution can encourage students to share rather than hide difficulties as they read. Of the four instances of noting relationships, two referred to texts Period 1 had read earlier and two referred to experiences at Oceanside that had happened outside of English 11. Students related their *Native Son* interpretations to these other texts and experiences using phrases such as “This makes me think of,” “I connect this to,” and “That/this connects to.”

Table 5.2: Dialogic strategies used by Peter’s students in Design Cycle 2.

<b>Dialogic strategies (ATLAS.ti codes)</b>	<b>Instances</b>	<b>Representative digital talk examples from <i>Native Son</i>, Book 1</b>
Admitting difficulty	7	<p>“I don’t understand why he feels so extreme toward his family.”</p> <p>“I’m trying to figure out why they think he’s afraid of himself.”</p>
Conjecturing	11	<p>“I wonder if they really hate and fear him like he thinks – that might be paranoia from other parts of his life.”</p> <p>“Maybe Bigger uses violence as a ‘way out,’ which will probably work as a domino effect – putting himself in deeper situations.”</p>
Elaborating	9	<p>“I want to add to your comment about his reaction to Mr. Dalton. He’s feeling suspicious because he never had a positive encounter with a white man before.”</p>

		“This quote is more evidence that he’s violent because he finds this an escape from fear around him.”
Noting relationships among tasks & texts	4	“This makes me think of the photos Mr. B showed us of Chicago.”  “He doesn’t feel like he has any choices in life and that’s what makes him feel frustrated. That connects to what Mr. R said in Retreat, that choices can’t be taken for granted.”
Reinforcing/supporting	17	“I agree with Luis that this shows the fear – Bigger’s scared somethings [sic] going to happen to him.”  “I think you’re right because his mother is putting pressure on him to get a job and the entire household is basically depending on him to make it.”

While the presence of these dialogic moves was encouraging, it did not escape our notice that students did not utilize the full range of available strategies. In fact, eight of the thirteen strategies were not used in Book 1’s digital talk: clarifying (increasing clarity by making distinctions), challenging (suggesting an alternate view or position), requesting clarification (seeking clarity about another’s statement or question), initiating (starting a new direction in the learning conversation), paraphrasing (expressing another’s thought in slightly different language), summarizing (listing main points to review general ideas), defining (offering definitions of words used by others), and activating background knowledge (making explicit connections with prior knowledge and/or experiences outside of the classroom). Additionally, we saw that language stem use was unevenly distributed across the students in their digital talk. For example, four students used one instead of two different strategies (one student used the same strategy twice), and three other students did not use any of the provided strategies (we noticed that these same students did not finish their reading assignment over break). Based on the Book 1 threads, it seemed that students favored more “low risk” strategies that called for taking up their peers’ ideas and offering their own lines of reasoning and experiences, while they avoided strategies that countered or questioned peers’ ideas or broke a line of thought.

In addition to these changes in digital talk participation, we also found that students demonstrated more dialogic orientations in their classroom talk. In the next excerpt (Excerpt 5.4), we see the group assigned to lead discussion about Bigger and Mr. Dalton employing strategies (bolded) matching those noted in the dialogic stems handout as they share their quotations and analyses of the characters and their interactions.

Excerpt 5.4: Excerpt from fishbowl discussion #1 for *Native Son* by Richard Wright.

1 Raymond Bigger feels really anxious around Mr. Dalton. He drops his  
2 cap; he says, 'He hated himself at that moment ...' [reads the  
3 quote from his iPad]. And he feels really awkward because  
4 Mr. Dalton is treating him with respect and kindness, which  
5 other white people's he's met haven't done. So he isn't really  
6 sure what to do and he doesn't like being treated like that  
7 because he's not used to it.

8 Jacob **And to expand on that quote a little bit**, so since Bigger's  
9 never really socialized or really had an encounter with a white  
10 person, and in this case it's a powerful white person, he  
11 mistakes the respect he's being given for mockery. He feels  
12 he's being mocked because maybe he doesn't feel he's worthy  
13 or he just doesn't know the feeling. **And I'm not sure if the**  
14 **nervousness comes from that fact that he's at a job**  
15 **interview or because he's a white person**, but this quote, 'He  
16 relaxed a little and then stiffened.' So Mr. Dalton leaves the  
17 room for a second and he relaxes and then he hears footsteps  
18 and he stiffens up again, and that really illustrates how  
19 nervous he is around this white family.

20 AJ **Another quote that kind of, um, illuminates all these ideas**  
21 **and all these other quotes is**, '[reads the quote from her  
22 iPad].' So basically, **what Raymond said**, they tried to help  
23 him with manners and being polite with him, he didn't quite  
24 see that. And he kind of feels that all white people he's met  
25 treat him the same way.

26 Beth So for my quote, "There was an organic conviction to him that  
27 this is how white folks wanted him to be." This was the way  
28 white folks wanted him to be when he was in their presence.  
29 That's representative of the reason he's acting this way around  
30 everybody. In the line before, he says, "He had raised his eyes  
31 once since he'd been in the house." So he's having trouble  
32 meeting their level of respect that they're trying to give him  
33 because he's uncomfortable with it and doesn't really know  
34 how to take it. **And it's similar to the way when Jan tells**  
35 **him he can call him Sir, and he just doesn't really know**  
36 **how to respond to it. He feels he needs to act a certain**  
37 **way, when he doesn't really have to.**

38 Peter Does anybody have anything to add on this topic?

39 Tiffany **What Raymond said**, "Now you needn't feel ashamed," I  
40 think the intent was he was trying to sympathize with Bigger,  
41 but it seemed like it didn't work because Bigger knows that  
42 Mr. Dalton didn't grow up the same way as him. And I feel  
43 like it goes hand and hand with pity almost.

44	Peter	Anyone else?
45	Claire	<b>Like Tiffany</b> , the quote, “I was a boy myself once,” um, I just
46		think Mr. Dalton was trying to make him comfortable and to
47		help him succeed in life, but Bigger didn't really know how to
48		take it in and kind of accept it.

This example from the students’ first fishbowl discussion about characters in *Native Son* represents the kinds of dialogic strategies we saw the students using to connect to, elaborate on, and reinforce their classmates’ ideas in their class conversations about the novel. Raymond, sitting in the middle grouping of four desks with Jacob, AJ, and Beth, begins the discussion by sharing his interpretation of Bigger’s feelings toward Mr. Dalton. He initiates the conversation by sharing his opinion that “Bigger feels really anxious around Mr. Dalton ... [and] feels really awkward because Mr. Dalton is treating him with respect and kindness, which other white people he's met haven't done” (lines 1-4). Following Raymond’s observations, Jacob announces his intention to expand or elaborates on Raymond’s comment with further detail. Jacob builds on his teammate’s point by conjecturing, or offering a tentative explanation for why Bigger feels awkward. He says he is “not sure if [Bigger’s] nervousness comes from that fact that he’s at a job interview or because [Mr. Dalton]’s a white person” (lines 10-11) but offers textual evidence to support his interpretation. AJ then introduces a quotation that she believes can “[illuminate] all these ideas and all these other quotes” from her teammates (lines 15-16). She does not elaborate on how her selected quotation connects to “all these ideas” but rather focuses on building a connection to Raymond’s point about Bigger through paraphrasing and reinforcement (“So basically, what Raymond said”). Her words suggest that she is trying to put her contribution in conversation with the ideas that her group has offered. Beth follows AJ by building on the broader ideas presented by her group by drawing attention to similarities between how Bigger feels about Mr. Dalton and another character, Jan.

Following these comments from the inner circle of the fishbowl, Peter, from his position at the podium (which is now positioned in the outer circle rather than “at the head of the class”), asks outer circle participants if they would like to add to the discussion. Tiffany responds by connecting to Raymond’s comment through elaboration, sharing her interpretation of Mr. Dalton’s actions and intentions and the reason for Bigger’s response. After Tiffany finishes speaking, Peter asks for additional commentary from the outer circle. Immediately, Claire enters the conversation to reinforce, or agree with, Tiffany’s point (“Like Tiffany”) by sharing her corresponding interpretation of Mr. Dalton’s intentions and Bigger’s resistance to Mr. Dalton. Comparing this interaction to the earlier discussions around Paul Laurence Dunbar’s poems and Kate Chopin’s short story (Excerpts 5.1, 5.2, 5.3) reveals a shift in the type of talk about texts and the volume of student versus teacher talk. While pre-design face-to-face discussions suggested the largely monologic organization of classroom talk, here we see the students’ drawing on dialogic moves as they share their textual interpretations and interact with their peers’ ideas.

As noted above, Period 1 students used five of the 13 available dialogic stems in their digital talk. It was therefore interesting to see that some of those “neglected” dialogic strategies were introduced in face-to-face discussions. In their two fishbowl discussions, students continued to favor elaboration and reinforcing but there were also some instances of challenging, clarifying, and drawing on background knowledge, strategies that were not used in students’

digital talk. For example, in this interaction during the second fishbowl (Excerpt 5.5), Dini challenges her teammate Eduardo's comments by posing an alternate reading of Bigger's reactions. This leads to Peter joining the conversation as a reinforcer and challenger, and to Eduardo clarifying his idea.

Excerpt 5.5: Excerpt from fishbowl discussion #2 for *Native Son* by Richard Wright.

- |    |         |   |
|----|---------|---|
| 1  | Eduardo | And then going back to when the reporter drives out to his        |
| 2  |         | home, they weren't really questioning Bigger so Bigger feels      |
| 3  |         | comfortable, but once they find the bones and the ashes, it       |
| 4  |         | says "they were looking at the bones of Mary's body. They         |
| 5  |         | would be looking for the murderer." And this is Bigger ... you    |
| 6  |         | can really see how much fear he had. He's really not              |
| 7  |         | comfortable throughout the whole story, he's shaking, stuff       |
| 8  |         | like that.  |
| 9  | Dini    | I had one other thing to say, but it's kind of opposite of what   |
| 10 |         | he [gesturing to Eduardo] said so, sorry [laughs]. So at the      |
| 11 |         | very beginning when he killed Mary, he was really freaking        |
| 12 |         | out and all this stuff, but then he starts to actually believe he |
| 13 |         | might actually get away with it. Completely opposite of what      |
| 14 |         | he's [Eduardo] saying.  |
| 15 | Peter   | Yeah, and you know what's funny [laughs a little, talking to      |
| 16 |         | Eduardo], you kind of contradicted yourself in what you were      |
| 17 |         | saying. The first thing you said was that he was really           |
| 18 |         | confident and comfortable when the newspaper men were             |
| 19 |         | around--  |
| 20 | Eduardo | Once the trouble's near, then he realizes that he's in trouble.   |

Eduardo suggests that Bigger changes from being confident about getting away with murdering Mary to experiencing acute fear. Dini challenges his reading with her own, that Bigger is gaining confidence over time, which she says is opposite of what Eduardo believes. She softens this divergent interpretation with an apology and teasing laughter but stands by her idea (line 10). Peter enters the conversation to agree with Dini and question Eduardo's reading, pointing out that Eduardo's interpretation seemed contradictory (lines 15-18). Sensing that Dini and Peter are misunderstanding his comment, Eduardo hurriedly jumps in to explain that he was not contradicting himself; his point, he says, was that Bigger initially felt comfortable but became fearful "once trouble's near." In this interaction, we see students and teacher interacting to present, challenge, and defend ideas. We also see the use of prosody (volume and intonation of speech that provides information beyond the mere words uttered), kinesics (physical cues such as facial expressions, hand gestures, and body position that provide information beyond what is shared in spoken language), and laughter as the participants engage in this work, characteristics that are fundamental to face-to-face discussion but absent in digital talk. While there were too few examples of challenging and clarifying across the discussions to draw any solid conclusions, the use of these strategies in face-to-face talk (and their absence in digital talk) raise questions about the affordances and constraints of different dialogic strategies in different learning

mediums. Additionally, the overall scarcity of challenging moves in the digital and face-to-face settings could suggest that there is a need to help students, across all available learning spaces, learn how to respectfully disagree with their peers, which can be viewed as a socially risky--and therefore unacceptable--move.

The additional tools of the fishbowl and the dialogic language stems seemed to help mediate a different discursive experience as students engaged with the ideas of their peers in ways that had been missing previously in both face-to-face talk and in digital talk. All of the students in the small groups spoke when it was their turn to lead discussion, and almost all of the students participated as outer circle members as well. Because Peter did not explicitly instruct his students to link to their classmates' ideas using the dialogic stems when he explained the procedures for the fishbowl discussion, the adoption of these strategies for face-to-face conversations suggests that students found these tools broadly versatile as dialogue supports in digital and face-to-face activity systems.

In addition to seeing how the mediating tools in the face-to-face setting shifted talk in both digital and face-to-face learning environments, it was particularly interesting to observe how digital talk "seeped" into face-to-face conversations. As I was coding my field notes and looking at video recordings of the two fishbowl discussions, I found 22 instances of students injecting their digital talk into the face-to-face conversations by reading aloud what they had written inside Subtext. I provide some examples below (Excerpt 5.6) taken from both fishbowls to illustrate what those sorts of instances looked like "live."

Excerpt 5.6: Excerpts from transcripts of fishbowls #1 and #2 for *Native Son*.

Fishbowl 1

Marisol: [**she leans forward to read her comment from her iPad on her desk**] Um, what was it that they wanted, why wouldn't they leave him alone? He's not bothering them. Bigger sees Mary and Jan's actions as teasing or trying to make fun of them, but [**looking up at Paul as she speaks**] maybe he's just reading too far into their actions and I think they're just -- we've said this like eight million times -- but like, just trying to make him feel comfortable and equal and trying to befriend him.

Alex: And then I found a quote that kind of relates to how she feels about it. And in the car when she says [**bends her head, reading from Subtext**], "After all, I'm on your side," he automatically thinks in his head, "Does she mean because she roots for black people and she just believes in equality?" I think it was more than that, I think she wanted a good relationship between the two of them [**looks up from her iPad**].

Fishbowl 2

Aaron: Ok, so, I have a quote about Peggy here. [reading from Subtext] She says, "I'm Irish, my folks in the old country feel about England what colored folks feel about this country, so I know something about colored people," and I think that shows she's really ignorant, because [**reading his comment in Subtext**] I guarantee you that it's, it's completely different for black people living in those torn-down apartments. And I think that ignorance is probably a really big factor in the white versus black tension and why black people feel the way they do about white people [**looks up from iPad**]. And so this

is kind of like a little snippet into the culture of America at that time where people who weren't black feel that just because they know a little bit of struggle they just know completely the deal.

AJ: And then another quote was, "He felt suddenly that he wanted something in his hand, something solid and heavy, a gun, a knife, a brick." And an explanation for it was **[reading her comment in Subtext]**, As Bigger lays out his plan to Bessie, he feels a great desire to have some kind of weapon in his hand. This is ironic because he has already done his killing. Nevertheless, it seems as he is speaking to Bessie in this scene, he does not seem to be complete, unless he has some sort of heavy weapon in his hand. To him, this weapon will legitimize him and it gives him a sense of power, a power he did not feel without it **[looks up from her iPad]**.

In these examples, students insert digital talk seamlessly into their fishbowl comments. In watching students during discussion and watching the video recordings of these conversations, I noticed that the practice of inserting digital talk into face-to-face conversation was signaled by students drawing their iPads closer, bending their heads to read their comment that they had embedded in a discussion thread. When students were finished reading from their digital talk posts, they would look up, usually at Peter, to show that they were finished. These comments had fewer pauses and filler words such as "um" and "uh" than spoken comments that were composed spontaneously during the course of the conversation.

These kinds of instances suggest the fluid nature of classroom talk across digital and face-to-face learning spaces in the classroom ecology, and the ways in which talk in these spaces can coexist and be mutually influential. Dialogic tools introduced to mediate face-to-face talk (dialogic language stems and fishbowl discussion structure) shifted digital and face-to-face talk practices in Peter's classroom. The examples of Marisol, Alex, Aaron, AJ, and other students who drew on their digital talk as a resource in nondigital talking-to-learn spaces suggest that students then drew on this "recycled"—or perhaps we could say remixed—talk to enrich their shared perspectives in the context of new classroom conversations. The students' hybridization of talk suggests a dialogic, reciprocal relationship between face-to-face and digital talk.

## CHAPTER 6: CONCLUSION

### Discussion of Findings

This study expands what it means to talk-to-learn in the 21st century through exploring the role of K-12 digital talk, or what I refer to as the interactive communication via signs and symbols that occurs in online spaces between two or more participants in a conversation. High quality, oral dialogues are known to help readers and writers develop new knowledge and deep understandings in classrooms (e.g., Alexander, 2008; Applebee et al., 2003; Freedman et al., 2005; Juzwik et al., 2013; Nystrand, 1997). Through survey and classroom design-based methodologies, this study of digital talk and the resulting learning experiences in K-12 classes nationwide shows important connections between digital and nondigital talk that influence meaning-making.

Surveys of 451 K-12 teachers who used a digital e-reader Subtext provided an initial look at digital talk from the perspective of teachers around the country. Teachers' reported uses of Subtext contrasted with their perceptions of its affordances and constraints, suggesting a tension between the intended improved learning opportunities of digital talk and the reality of implementing digital talk with their students. The survey data suggested the teachers primarily used digital talk via Subtext as a tool that helped make their job more efficient rather than as a tool to help their students learn. Teachers tended to frame digital talk as a teacher tool that facilitated teacher-initiated communication rather than as a student tool that facilitated student-posed questions and student-led engagement with peers. However, the majority of the teachers also believed Subtext encouraged increased student talk and provided participation opportunities different from those found in face-to-face discussion.

In addition to highlighting some patterns in K-12 approaches to digital talk, the survey results helped to contextualize the work that I did with Lisa, the elementary teacher in the first design study, and Peter, the secondary teacher in the second design study. Contrary to the belief held by most of the survey respondents, digital talk spaces in Lisa's and Peter's classes did not provide an "alternate reality" that transformed classroom discourse. Analyses of Phase 1 digital talk in both classes found that despite the teachers' intentions to provide opportunities for student discussion in the e-texts, the organization of classroom talk that provided little space for student dialogue undermined those good intentions. Research on new media in schools continues to document how teachers struggle with integrating digital tools in ways that address collaborative and student-led learning (Hutchison & Reinking, 2011; Reich et al., 2012), and the findings from this study's different datasets affirm the persistence of this challenge.

Since design-based research focuses on what could be versus what is, this research was able to use the design collaborations with Lisa and Peter to imagine and implement new types of digital talk. Lisa and I explored how her fourth- and fifth-grade students' interactions in Subtext might support their developing understandings of main idea, voice, and theme. Our design cycles helped us develop the "humble theory" (Cobb et al., 2003) that student-to-student digital talk could help Lisa's students build on each other's ideas and support sophisticated understandings about how to interpret literature. When she organized learning in ways that prioritized giving students multiple opportunities and methods for understanding the concepts, digital talk seemed to reinforce these concepts in Lisa's class. However, an equally important tool for building knowledge throughout the mini unit was face-to-face talk. Learning did not flourish through

digital talk alone. Although Lisa and I began our work with the intent to design for collaborative conceptual knowledge development in the digital space, we found that digital talk was an ineffective tool until students developed stronger understandings of the concepts in the face-to-face setting. As we looked at how students struggled with articulating and identifying main idea, voice, and theme in Subtext, Lisa and I had to redesign to revisit main idea, voice, and theme with additional methods, including multiple whole-class reviews, outside-class textual examples, and posters, to progress toward the goal of having students use digital talk to develop their understandings of these literary concepts.

Lisa and I also found that digital talk provided access to students' thinking in real time and so allowed us to track their developing understandings of concepts and to quickly redesign lessons attuned to students' demonstrated learning needs. Similarly, teacher survey respondents reported that the transparency around student work was a major benefit of the digital medium, noting that digital talk allowed them to quickly see what their students understood. These findings suggest that having up-to-date, easily viewable assessments of student learning--and ongoing archives that document development over time--is a valuable affordance of digital talk.

Like Lisa, Peter hoped to foster dialogic digital talk in his English 11 class. In place of the "submit it and forget it" approach to digital talk that he noticed among many of his students, he envisioned digital talk as a tool that would support collaborative discussions about class texts. Through our work together, Peter and I found that changing established rules and norms of digital talk in the e-texts did not shift students' digital talk participation. Rather, it was not until we attended to the broader classroom ecology and reorganized face-to-face talk about texts that we noticed some more dialogically-oriented shifts in digital talk. This approach led us to introduce in his classroom additional student-led and teacher-led dialogic tools, fishbowl discussion structures and dialogic language stems. We found that these additional tools in the face-to-face setting shifted talk in both spaces. The student talk that emerged from these designs suggested the fluid nature of classroom discourse across digital and face-to-face learning settings. These findings helped us develop the working theory that digital talk and face-to-face talk are mutually influential. Seeing how Peter's students folded talk that originated in the face-to-face setting into their digital talk, and then reintroduced that digital talk into new face-to-face discussions, demonstrates that learning talk, in its different guises, is itself a result of the dialogic relationship between learning spaces.

My design work with Peter, Lisa, and their high school and elementary school students highlights how talking to learn in the 21st century happens in and across complex social ecologies (Cole, 1996; Lave, 1996). Changing how students in each class engaged with the tool of digital talk required a reorganization of not only the digital activity system but of the face-to-face system as well. For each design case, the teacher and I began by shifting rules and tasks in Subtext to influence digital talk. However, our designs revealed the contradictory connections that the digital classroom community had with its established classroom talk practices. Lisa and Peter both wanted to leverage digital discourse for collaborative knowledge building, but our designs instead revealed the contradictions between these imagined uses of digital talk as a tool and the established talk practices--shaped by community rules and roles--of the teacher and students (Engeström, 1999).

The findings from the design-based research and the survey also highlight the critical role teachers continue to play in our digital age. Teachers have not been taken out of the equation; in fact, they face increased pressures related to teaching "the digital generation" and using

technology to support students' learning. For example, the 2017 National Education Technology Plan emphasizes digital affordances that make "everywhere, all the time learning possible" and the teacher's duty to "[enable] learning and teaching through creation, production, and problem-solving" (2017, p. 5). The assumption seems to be that if teachers simply introduce technology tools as a means to create, produce, and problem-solve, then "21st century learning" will be realized. This lens positions the teacher as the person who identifies the tools that activate student engagement rather than as an integral actor who directly influences student engagement. The results of my study counter the argument that digital tools render teachers less important to the success of their students and hopefully support an emphatically affirmative answer to the question: Does the teacher matter as much in our digital age?

The entrenched assumption that digital tools inherently enhance learning poses a challenge when arguing for emphasis on how teachers organize practices around digital talk. The teachers' survey responses that framed digital talk as happening in a space impermeable to face-to-face talk dynamics suggested the prevalence of this belief; some current ideas in digitally mediated learning research espouse this assumption as well. For example, in a recent blog post on the Digital Media and Learning research site, Kim Jaxon noted that "digital platforms also enter the classroom without the baggage of the educational institution" (Jaxon, 2017). A statement such as this suggests that the digital has special properties and that digital tools are somehow immune to the "baggage" of educational institutions. Yet, this study demonstrates that the digital can be a space where unproductive practices from the face-to-face are reproduced.

Educators want to leverage new tool affordances in ways that support student learning, but digital media in themselves are not transformative. Jaxon's words remind us that digital media in the classroom can invite romanticism with respect to what happens when young people use these tools. Nearly 15 years ago, Glynda Hull noted that a challenge for educators was to balance a celebration of young people's digitally mediated practices with a clear-eyed, unromanticized view of those practices (Hull, 2003, p. 233). This observation holds true as digital talk gains further traction in K-12 spaces and teachers confront more design decisions about the implementation of digital tools.

### **Implications for Practice**

The survey data and design collaborations with Lisa and Peter affirm that magic does not happen merely by providing students with innovative tools. A significant finding from the survey is that while nearly 83% of the participating K-12 teachers viewed digital talk as a tool that offered more opportunities for student voice, the top reported uses of Subtext (close reading and teacher-initiated postings) tell us that what teachers think is happening with digital talk does not align with what seems to be happening. With Lisa and Peter, it was only after considering the broader classroom ecology together with the affordances and constraints of available tools--digital and non-digital--that we were able to reorganize practices to support learning across face-to-face and digital learning contexts. Instead of isolating face-to-face talk opportunities from the digital, perhaps it is more productive to think about how these different talking-to-learn opportunities travel and interact across the discursive spaces that are now available in many classrooms. Recognizing the fluidity and reciprocal nature of digital and nondigital practices may help practitioners leverage the available tools and identify possibilities for learning.

Furthermore, the dialogic nature of digital and face-to-face talk suggested by this study's

findings calls for more attention to the education of in-service and pre-service teachers regarding classroom talk. With more talk opportunities available in face-to-face and digital settings, teachers could benefit from explicit training in learning theories to ground dialogic planning and instruction and access to practical tools that bring those theories to life in ways that make sense for everyday classroom life. Additionally, because meaningful classroom talk can look like many things (for example, as we saw in Lisa's class, additional teacher-led reviews of concepts were part of the design that helped students move closer to the goal of dialogic digital talk interactions), teachers need lenses to critically evaluate tool affordances and constraints relative to their pedagogical goals. Some teacher educators have started to examine what this work looks like in the face-to-face classroom setting for English language arts (Juzwik et al., 2012), but capacity building around classroom talk seems inconsistent, cursory, and/or rare for both pre- and in-service teacher education.

Research on the spread and scale of educational innovations in a digital age (Coburn, Catterson, Higgs, & Morel, 2013) emphasizes that the beliefs, assumptions, interests, and experiences that influence the behavior of individuals play a critical role in who takes up new ideas, tools, and work practices (Coburn, Catterson, Higgs, & Morel, in press). Lisa and Peter were fortunate to have the support of their principals and access to the infrastructure and tools needed to use digital talk in their classrooms. However, they mostly were on their own in terms of procuring professional development experiences that would help them make the changes they wanted to see in their teaching. As Peter shared, he had received very little discussion training in his teacher preparation program even though his instructors told their students that discussion was an important learning tool. Thus, he developed the understanding that dialogic interaction was significant without the conceptual tools (principles, frameworks, and ideas about teaching and learning that teachers use to guide pedagogical decisions) and practical tools (classroom practices, strategies, and resources that have more immediate use) to enact it (Grossman et al., 1999). During our final reflections, both Peter and Lisa mentioned that having a thinking partner had helped them to focus on their pedagogical goals for digital talk and to begin shifting instructional practices. Whether through a university collaboration, such as the partnership the teachers and I undertook, or through a professional learning community, in-service teachers need ongoing supports—not one-stop-fix-its, which, ironically, these days often come packaged as a digital tool—to address their problems of practice (Horn & Little, 2010). Further, these supports must account for the experiences that teachers bring to their practices and for the local contexts in which they teach.

The support that teachers receive for managing talk, in all its available forms, is a critical issue in educational equity. Because so many students depend on their teachers to facilitate consequential uses of cultural tools, the role of the teacher is augmented rather than diminished when it comes to leveraging new forms of communication, such as digital talk (Freedman et al., 2016; Warschauer & Matuchniak, 2010). Helping youth access the potential of written and spoken discourse in school requires the thoughtful mentorship of supportive adults, but what does it mean to support the adults who do this work? What dialogic tools are needed to mediate rich learning about classroom talk for teachers, and how can those tools be adapted to local needs? Just as the ubiquity of new media in our everyday lives can lead to assumptions that teachers know how to use digital technologies to support learning, the fundamental role of talk in our social worlds can lead to assumptions that good classroom conversations “just happen” when students “feel like talking.” However, the reality--for both digital tools and classroom talk--is

much more complicated, as findings from this study suggest. Even in our more advanced digital age, how tools get used, even those that afford expansive uses, depends on how teachers conceptualize learning, texts, and participation. Some of the challenges that emerged during the design collaborations may have come as much from the teachers' notions of texts and learning as they did from the tools used. Teachers have the obligation to prepare their students to participate in dialogic learning that is life-wide and life-deep (Banks et al., 2007), so how teachers are supported to meet and design for this challenge demands renewed, careful consideration.

### **Implications for Research**

Descriptions of changes that result from iterative design cycles can never fully capture the messiness that is involved in reorganizing activity systems. As a researcher, I am committed to working side by side with teachers to address practical problems that they identify. Even so, the negotiations and even resistance that were part of the collaborative and amicable design work that Lisa, Peter, and I carried out together showed me how important it is for researchers wishing to conduct design work “in the crucible of the classroom” to engage in true partnership with teachers. A criticism of design-based research is that it is often carried out from a researcher-driven perspective, with researchers primarily responsible for the design, enactment, and analysis of the learning (Engeström, 2011). I tried to counter traditional teacher-researcher power dynamics by positioning myself as a thinking partner (and not an instructor or the primary designer), but even so, there were a number of occasions while working with the teachers that the clash of our discourses became apparent.

For example, the process of reviewing and selecting dialogic tools with Peter to reorganize face-to-face talk was not nearly as tidy as it appears in Chapter 5. He resisted most of the tools outright and said that he could not see himself using certain strategies because they were “just very not [him].” Although I felt that there were several viable, research-grounded ideas to try, working side by side with Peter in that instance meant listening closely, drawing on my knowledge of his history with classroom discussion (at Oceanside and in teacher education), and recognizing that design collaborations are always “contested terrains, full of resistance” (Engeström, 2011, p. 3). It may be tempting for some design researchers to define what knowledge means and the kinds of change that are valued and implemented, but engaging in authentic partnership, I would posit, means that “what works” in the classroom cannot be determined without a teacher's co-participation and co-design.

In addition to these methodological considerations, this study has highlighted some potential paths for future research. One is the close investigation of students' perspectives and practices related to classroom talk (digital and face-to-face). The present study focused on teachers and designing with teachers. Going forward, more research is needed that examines how students engage in digital talk for academic work and the repertoires of practice (Gutiérrez & Rogoff, 2003) that they bring to that digital talk. For example, I would be interested in exploring how dual language learners use digital talk in schools. Understanding when students use their first language for digital talk and if/how first and second languages interact in digital talk could inform how teachers organize digital talk practices to support dual language learners.

Another important future direction for digital talk research is the use of data mining technologies to detect patterns in large sets of digital talk data collected from classrooms nationwide. Vast amounts of data are available, and advances in data analytics open up new

windows for understanding. I have been in conversation with the company behind Subtext about obtaining such data, and I hope to be able to pursue this analysis as part of a future study. Topic modeling, a method of natural language processing using computational algorithms, could allow for the discovery of patterns of word use and connections between documents that exhibit similar patterns (Blei & Lafferty, 2009), such as digital talk threads. These “big” data could help me identify the broad contours of digital talk types in a large sample of classrooms. They also could allow me to make inferences about the kinds of learning experiences engendered through varieties of digital talk. Finally, these data could allow me to check for the normativity of digital talk types noticed during the design collaborations reported on in this dissertation. Taking advantage of the increased availability of digitized text repositories and computational capacities to analyze content would be an exciting next step in creating a strong foundation for understanding connections and disconnections between digital talk and student learning. Use of computational text analysis is still rare among literacy researchers, but combined with the availability of digital text repositories, these techniques have the potential to offer new analytical avenues to the field of literacy studies.

Finally, there seems to be a need for programs like Subtext, that include opportunities for digital talk, to be accessible to more teachers and students. To provide some context for this statement, Subtext started out as a free e-reader app and was a free download when I first became aware of it in 2011. In 2012, Subtext was acquired by a large educational technology company, and a pricing structure was introduced. At first there was a premium service that provided lesson plans in addition to the features in the free version. The premium and free versions disappeared when Subtext was integrated into a subscription-only program. I spoke with a number of teachers who stopped using Subtext with their students because their schools could not or would not pay the subscription fees, and the teachers could not afford the subscriptions costs on their own. Another deterrent for teachers was a dramatic change in the kinds of teacher-created materials supported in the app. During winter 2016, Peter told me that he was informed by the company that e-books and their associated notes, highlights, and discussions would no longer be stored. Accordingly, teachers’ materials that were archived in Subtext were wiped from the servers. This change was extremely frustrating for both Peter and Lisa--as I’m sure it was for any teacher who had invested time in creating digital documents that, presumably, should have lasted indefinitely and been more convenient than paper materials to revise, share, and transfer.

Ultimately, this study shows that digital talk holds promise as a tool for student learning. With designs that account for the complex ways in which students and teachers talk in and across available communication spaces, digital talk in classrooms can help students build on each other’s ideas and support disciplinary learning. That said, without appropriate supports for students and teachers alike, learning through digital talk will remain a promise rather than a reality.

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## Appendix A: Numbered Teacher Survey Items

1. Why are you using Subtext in your classroom for reading? Please choose all the responses that apply to you.
  - a. To support close reading (for example, students demonstrating understanding of text details through embedded questions)
  - b. To support vocabulary acquisition
  - c. To support student-initiated textual annotations embedded in Subtext (for example, student-posted questions and comments about the reading assignment)
  - d. To support student book clubs or literature circles
  - e. To support “text-to-world” connections (for example, students adding hyperlinks or images from outside the classroom text to their Subtext responses)
  - f. To support students’ comprehension of text using Subtext’s text-to-speech function
  - g. Other [text box]
  
2. Why are you using Subtext in your classroom for writing? Please choose all the responses that apply to you.
  - a. So students practice how to gather evidence from classroom texts
  - b. So students practice how to gather evidence from text resources outside classroom texts (for example, audio and visual resources)
  - c. So students share ideas with other readers inside the text
  - d. So students practice annotating text
  - e. So students write collaboratively with other students
  - f. So students practice academic writing
  
3. Please choose all the responses that apply to your classroom uses of Subtext.
  - a. Whole class reading
  - b. Small group reading
  - c. Student pairs reading
  - d. One-to-one teacher and student reading
  - e. Individual students reading
  - f. Students reading on the app outside of scheduled class time
  - g. Geographically separated students reading together (for example, reading texts with other classrooms)
  - h. Pre-writing activities before a formal writing assignment
  - i. Teacher posing questions inside the text
  - j. Student posing questions inside the text
  - k. Accessing and using Subtext standards-based curricular materials
  - l. Other [text box]
  
4. Subtext allows for students who do not normally participate in whole group discussions to participate.
  - a. Yes
  - b. No

- c. Maybe [text box]
5. What is the last text you used in Subtext with your students? [text box]
  6. In your opinion, how does using Subtext compare with using more conventional curricular tools and approaches? [text box]
  7. How long as you used Subtext with students?
    - a. One school semester or less
    - b. Two school semesters
    - c. Three school semester
    - d. Four school semesters or more
  8. In what grade(s) have you used Subtext? Please select all that apply.
    - a. 1
    - b. 2
    - c. 3
    - d. 4
    - e. 5
    - f. 6
    - g. 7
    - h. 8
    - i. 9
    - j. 10
    - k. 11
    - l. 12
  9. How long as you been teaching literacy in a school?
    - a. Less than 1 year
    - b. 1-2 years
    - c. 3-5 years
    - d. 6-10 years
    - e. Over 10 years
    - f. Other [text box]
  10. What best describes your school setting?
    - a. Urban
    - b. Suburban
    - c. Rural
    - d. Public
    - e. Private
    - f. Parochial
    - g. Other [text box]

## Appendix B: Cognitive Lab Protocol for Teacher Survey (Think Aloud)

Cognitive Stage	Definition	Response Errors/Question Problems
Comprehension	Respondent interprets question	Unknown terms, ambiguous concepts, long overly complex
Memory Retrieval	Respondent searches memory for relevant information	Recall difficulty
Information Summarization	Respondent evaluates and/or estimates response	Biased or sensitive, estimation difficulty
Answer Reporting	Respondent provides information in the format requested	Incomplete response options; vague or confusing answer formats

### Procedure:

1. I will start by explaining that the purpose of this pilot is to try to understand how the respondent understood a question and how she/he came upon their answer.
2. I will explain that I will be using a think-aloud protocol and that this format asks respondents to share their process of understanding and responding to the survey questions with free-form answers that are shared aloud (“What is going through your mind?”)
3. I will ask the respondent if he/she has any questions about the format of the cognitive test. (Typically one starts out with a little warm up on a completely unrelated task, such as think through this question: “How many windows are there in your home? Now talk me through your thought processes as you think through trying to answer that question.”)
4. Once the respondent’s questions have been answered, I will email him/her a Word doc copy of the survey so that he/she can follow along.
5. Once the respondent has the document open, I will read survey directions aloud. I will ask the respondent if she/he has any questions about the survey before we begin.
6. I will read Question 1A and the options aloud. Following that, I will ask the respondent to explain in own words what the question is asking her/him to do.
7. Following their response, I will then ask the respondent to explain what is going through her/his mind as she/he looks over the response options and selects a response/responses.
8. I will follow this same procedure for all the survey questions.
9. For each question, I will note if the respondent (a) needs me to repeat any part of the question; (b) has difficulty using the response option; (c) asks for clarification or qualify their answer.

### Possible follow-up probes as respondents report their answers:

- Please tell me what I was asking in your own words?
- What made you say that?
- Why did you respond that way?
- What does that mean to you?

## Appendix C: Semi-structured Teacher Interview Protocol

**Length of Interview & Data Collection:** Approximately 45 minutes. Interview will be recorded on a digital audio recorder. The interviewer will take reflection notes after the interview session is complete.

### Purpose:

- Understanding the teacher's history as an educator
- Understanding the teacher's experience of teaching at [school name]
- Understanding the teacher's perceptions of her/his students
- Understanding the extent to which the teacher has access to professional development
- Understanding the teacher's experience with technology in the classroom
- Understanding the teacher's reason(s) for using Subtext with students
- Understanding the teacher's perceptions of affordances and constraints related to teaching and learning with Subtext
- Understanding teacher's perception of students' uses of Subtext

### Questions:

1. How long have you been teaching?
2. Could you describe your educational background, including your path to teaching?
3. What has been your experience as a teacher at [school name]?
4. What do you teach right now? What are your students like?
5. Do you participate in professional development at [school name] or off-site? [If "yes,"] What kind of PD? [In "no"] What keeps you from participating?
6. How long have you been using digital technology in your classroom? These might be computers, multimedia platforms, online tools, etc.
  - a. What kinds of technology are you currently using in your classroom(s)?
  - b. Why did you decide to incorporate those technologies?
7. You mentioned you use technology in your class to [fill in previously mentioned examples]. I'd like to narrow in on Subtext for a moment. Could you tell me why you're using Subtext in your classroom?
8. How do you use Subtext with your students – maybe talk me through a lesson where you've used Subtext?
9. What do you consider as you're planning lessons with digital books? Is lesson planning different when you're teaching with a paper book?
10. Based on your experiences, can you describe some challenges and benefits you've noticed as you've used Subtext in class?

## Appendix D: Poems Read During Phase 2 Design Work in Lisa's Class

"The Proper Way to Eat"

John Frank

The way to eat your lunch meat  
is to roll it into tubes.  
The way to eat your Jell-O  
is to jiggle all the cubes.  
The way to eat your Swiss cheese  
is to nibble it like mice.  
The way to eat your water  
is to chew the chunks of ice.  
The way to eat your doughnut  
is to try to save the hole.  
The way to eat your ice cream  
is to overfill the bowl.  
The way to eat your pudding  
is to suck it through a straw.  
The way to eat your peanuts  
is to store them in your jaw.  
The way to eat your apple  
is to munch it like a hog.  
The way to eat your spinach  
is to feed it to your dog.  
The way to eat your noodles  
is in one unending slurp.  
The way to end your meal  
is with a record-breaking BURP.

"Meat Loaf"

Kenn Nesbitt

My mother made a meat loaf  
but I think she made it wrong.  
It could be that she cooked it  
just a little bit too long.  
She pulled it from the oven;  
and we all began to choke.  
The meatloaf was on fire  
and the kitchen filled with smoke.  
The smoke detectors squealed  
at all the flaming meatloaf haze.  
My father used his drink  
to try extinguishing the blaze.

Mom shrieked and dropped the meat loaf;  
it exploded with a boom,  
and splattered blackened globs on  
every surface in the room.  
The dog passed out. The kitten hid.  
My brother screamed and fled.  
The baby ate a piece of meat loaf  
sticking to her head.  
My father started yelling  
and my sister went berserk.  
But I kept cool and said, “at least  
our smoke detectors work.”

“Powdered Sugar”  
Sydney Kleinhenz

I hurried in the restaurant  
to have a special treat.  
I ordered pancakes covered with  
my favorite thing to eat.  
It wasn't maple syrup,  
not molasses, honey, jam.  
I said, “Put heaps and piles  
of powdered sugar on it Ma'am.”  
The food arrived completely coated  
with the tasty fluff.  
I cut a bite and raised my fork  
to gobble up the stuff.  
Instead, I goofed—I breathed it in  
and quickly had to cough.  
My choking blasted  
all the luscious pancake topping off.  
I blew a powdered sugar storm  
that flurried 'round the room.  
It snowed on the linoleum—  
the waitress got a broom.  
It fell on heads like dandruff flakes.  
It frosted every light.  
It powdered babies' bottoms,  
and turned chocolate milk to white.  
I blinked, and rubbed my cloudy eyes,  
and sneezed a snow-white booger.  
I saw my pancakes, and I said,  
“I need more powdered sugar!”

“If I Were in Charge of the World”  
Judith Viorst

If I were in charge of the world  
I'd cancel oatmeal,  
Monday mornings,  
Allergy shots, and also Sara Steinberg.

If I were in charge of the world  
There'd be brighter nights lights,  
Healthier hamsters, and  
Basketball baskets forty eight inches lower.

If I were in charge of the world  
You wouldn't have lonely.  
You wouldn't have clean.  
You wouldn't have bedtimes.  
Or "Don't punch your sister."  
You wouldn't even have sisters.

If I were in charge of the world  
A chocolate sundae with whipped cream and nuts would be a vegetable  
All 007 movies would be G,  
And a person who sometimes forgot to brush,  
And sometimes forgot to flush,  
Would still be allowed to be  
In charge of the world.

“Diving Board”  
Shel Silverstein

You've been up on that diving board.  
Making sure that it's nice and straight.  
You've made sure that it's not too slick.  
You've made sure that it can stand the weight.  
You've made sure that the spring is tight.  
You've made sure that the cloth won't slip.  
You've made sure that it bounces right.

“October Dilemma”

Amy Ludwig VanDerwater

I don't want  
this mouse  
but  
I don't want  
this trap  
to lure him  
with cheese  
slamming  
down  
with a snap  
on his furry  
brown neck  
when he takes  
that first bite  
of a treat  
and a trick  
left by me  
in the night

“Face Poem”

Amy Ludwig VanDerwater

I ask Grandpa  
*Why is your face so wrinkly?*  
Mom hushes me  
With arrows from her eyes.

Grandpa hushes her  
Raises my hand to his forehead.  
*You write poems with pencil on paper.*  
*I write poems with years on my face.*

His hand over mine  
Grandpa reads his forehead like braille –  
*My parents were poor but happy.*  
He reads his cheeks –  
*The War Years made me a man.*  
He reads his chin –  
*I will always love Grandma.*

I touch the corners of his eyes

and read every smile, every joke  
as lines of poems  
of laughter  
fly to Grandpa's temples  
like shooting stars.

Pre-design and post-design assessment poems

"I'm Not Picky"  
Kenn Nesbitt

I'm not picky.  
I'm not rude.  
Why, I'll eat any  
kind of food.  
Except for foods  
called "beets" or "greens."  
Or "beef." Or "beans."  
Or "tangerines."

I won't eat foods  
called "fish fillets."  
Or "pies." Or "fries."  
Or "mayonnaise."  
Or "grapes." Or "crepes."  
Or "chicken wings."  
Or "clams." Or "hams."  
Or "onion rings."

Or anything  
called "baked" or "stewed."  
Or "boiled" or "broiled."  
Or "barbecued."  
Or "dried" or "fried."  
Or "smoked" or "steamed."  
Or "roasted," "toasted,"  
"mashed," or "creamed."

No, I'm not picky.  
I'm not rude.  
Why, I'll eat any  
kind of food,  
and ask for more  
and then say, "Please."

As long as it's called  
"mac and cheese."

"Living"  
Denise Levertov

The fire in leaf and grass  
so green it seems  
each summer the last summer.

The wind blowing, the leaves  
shivering in the sun,  
each day the last day.

A red salamander  
so cold and so  
easy to catch, dreamily

moves his delicate feet  
and long tail. I hold  
my hand open for him to go.

Each minute the last minute.

**Appendix E: Comparative Table of Students' Pre- and Post-Design Assessment Responses**

Student	Pre-design open-answer item: <b>Read this poem "I'm Not Picky" by Ken Nesbitt and write what you think the theme is.</b>	Post-design open-answer item: <b>Read this poem called, "Living" by Denise Levertov and write what you think the theme is.</b>
Amaya	The theme of this poem actually is pickiness (despite the title). In this poem, the character claims he or she is not picky, but at the end of this poem the character states that he or she prefers to eat macaroni and cheese most of the time.	I think that the theme in in this poem is living life to the fullest. I have this opinion because in the last line of the last stanza, the sentence says, "Each minute the last minute," which I think means somebody is about to pass away.
Dallas	the theme is calling himself not a picky eater.	The theme is that summer doesn't last forever
Doug	He will only eat Mac and cheese.	Each day he thinks it will be the last but it just keeps on going. Each day it gets hotter and hotter.
Hailee	I think the poems theme is that he like Mac in cheese a lot but he is not picky for ant thing else.	The theme is that he is waiting for a high five or someone to take his hand.
Hayden	the theme is about he only eats mac and cheese	the theme is don't rush growing up, take time because who knows you might die in any second.
Henry	I think is that he/her is not picky with Mac and cheese. But he/her will be picky if it's something else.	So the theme is summer is almost over and it's going to be cold so every minute in summer is like the last minute.
Jaslyn	I think the theme is that he really loves mac and cheese	The theme is notice the living things around you
Jason	The theme is that this kid is only going to eat mac and cheese, but thinks he is not picky.	The theme of this poem is that at the end of Summer, everything will start getting cold and it is miserable.
Kat	I can tell this poem has a theme of being picky even though they may not know	I think the theme is how time goes by so fast.I think that because how the author was making the character say all of the seasons and how they said each minute the last minute.
Kendall	The theme is about a kid that likes Mac and cheese	i think the theme is nature is beautiful
Lukas	he thinks hes not picky.	The person is very patient.
Noah	That he'll only eat Mac and cheese and only that.	I think the theme is that each minute is precious to you and you should enjoy it because the boy is enjoying the hours. I think the authors message is that the

		world is beautiful and you should sit back and enjoy it.
Nolan	he only likes Mac and cheese	Theme is anything can happen so make life last long
Reese	That the character likes mac and cheese.	The theme is that living things move with time.
Ruben	The kid is picky, onky eating/asking politely when the food happens to be mac and cheese, but does not want to admit it.	I think that the theme of this story is that life is only so long, and that you should enjoy it. At the same time, I think that the writer doesn't want you to anticipate death constantly, or nothing will come out of life.
Ryan	Picky for any food besides Mac and cheese	I think the theme is that like um every minute every secent countes. I think this cause every time he say last something so it just popped into my head.
Savannah	the theme is that he really loves mac and chesse and he says he's not a picky eater but he really is	The theme is spend the day like it is the last day
Sophia	I think the theme is that he really likes mac and cheese. And if he has mac and cheese he will eat it all and ask for more please.	I think the theme is that in the summer everything is so dreamy and pretty. I think this because the leafs and grass are sleeping. The salamander is drifting carelessly. I think the theme means that in summer it is easy to get salamanders.
Tanner	You are picky and you are either pretending not to be or, you don't believe you are.	Natural good things don't last very long.
Theo	the theme is that he doesn't think he's picky but he'll only eat mac and cheese.	The theme of this story is that sometimes life can be amazing if you pay attention.
Willa	The theme is saying that the kid in the poem is not picky.	The theme is that it is a peaceful summer day, and this kid caught a lizard. They are saying you might want to let the lizard go.
Zach J.	he is not picky when it come to mac and cheese.	I think the theme is that you should respect and spend every minute like it is the last with the things you love and like.
Zach R.	I think the pome is about not being picky and not being rude.	The theme is that a minute could be your last of your life.

## Appendix F: Poems “Sympathy” and “Frederick Douglass” by Paul Laurence Dunbar

“Sympathy” by Paul Laurence Dunbar

I know what the caged bird feels, alas!  
When the sun is bright on the upland slopes;  
When the wind stirs soft through the springing grass,  
And the river flows like a stream of glass;  
When the first bird sings and the first bud opes,  
And the faint perfume from its chalice steals—  
I know what the caged bird feels!

I know why the caged bird beats its wing  
Till its blood is red on the cruel bars;  
For he must fly back to his perch and cling  
When he fain would be on the bough a-swing;  
And a pain still throbs in the old, old scars  
And they pulse again with a keener sting—  
I know why he beats his wing!

I know why the caged bird sings, ah me,  
When his wing is bruised and his bosom sore,—  
When he beats his bars and he would be free;  
It is not a carol of joy or glee,  
But a prayer that he sends from his heart's deep core,  
But a plea, that upward to Heaven he flings—  
I know why the caged bird sings!

“Frederick Douglass” by Paul Laurence Dunbar

A hush is over all the teeming lists,  
And there is pause, a breath-space in the strife;  
A spirit brave has passed beyond the mists  
And vapors that obscure the sun of life.  
And Ethiopia, with bosom torn,  
Laments the passing of her noblest born.

She weeps for him a mother's burning tears--  
She loved him with a mother's deepest love.

He was her champion thro' direful years,  
And held her weal all other ends above.  
When Bondage held her bleeding in the dust,  
He raised her up and whispered, "Hope and Trust."

For her his voice, a fearless clarion, rung  
That broke in warning on the ears of men;  
For her the strong bow of his power he strung,  
And sent his arrows to the very den  
Where grim Oppression held his bloody place  
And gloated o'er the mis'ries of a race.

And he was no soft-tongued apologist;  
He spoke straightforward, fearlessly uncowed;  
The sunlight of his truth dispelled the mist,  
And set in bold relief each dark hued cloud;  
To sin and crime he gave their proper hue,  
And hurled at evil what was evil's due.

Through good and ill report he cleaved his way.  
Right onward, with his face set toward the heights,  
Nor feared to face the foeman's dread array,--  
The lash of scorn, the sting of petty spites.  
He dared the lightning in the lightning's track,  
And answered thunder with his thunder back.

When men maligned him, and their torrent wrath  
In furious imprecations o'er him broke,  
He kept his counsel as he kept his path;  
'Twas for his race, not for himself he spoke.  
He knew the import of his Master's call,  
And felt himself too mighty to be small.

No miser in the good he held was he,--

His kindness followed his horizon's rim.  
His heart, his talents, and his hands were free  
To all who truly needed aught of him.  
Where poverty and ignorance were rife,  
He gave his bounty as he gave his life.

The place and cause that first aroused his might  
Still proved its power until his latest day.  
In Freedom's lists and for the aid of Right  
Still in the foremost rank he waged the fray;  
Wrong lived; his occupation was not gone.  
He died in action with his armor on!

We weep for him, but we have touched his hand,  
And felt the magic of his presence nigh,  
The current that he sent throughout the land,  
The kindling spirit of his battle-cry.  
O'er all that holds us we shall triumph yet,  
And place our banner where his hopes were set!

Oh, Douglass, thou hast passed beyond the shore,  
But still thy voice is ringing o'er the gale!  
Thou'st taught thy race how high her hopes may soar,  
And bade her seek the heights, nor faint, nor fail.  
She will not fail, she heeds thy stirring cry,  
She knows thy guardian spirit will be nigh,  
And, rising from beneath the chast'ning rod,  
She stretches out her bleeding hands to God!

**Appendix G: Dialogic Language Stem Sheet Used During Phase 2 Design Work in Peter’s Class (Juzwik et al., 2013)**

<b>Strategy</b>	<b>Working Definition</b>	<b>Discussion phrase(s)</b>
Elaborating	Extending a previous comment or question by adding further detail.	"I want to add to the comment about..." "I have more evidence for..."
Clarifying	Increasing clarity by making distinctions	"That is true in two different senses..."
Reinforcing/ Supporting	Making visible a convergence in thinking or agreement with another's thoughts	"I agree with..." "I found that comment interesting because..."
Challenging	Using a question or statement to suggest an alternative view or position	"I disagree with..." "What about...?" "An alternative hypothesis would be..."
Conjecturing	Suggesting tentative explanations or possible outcomes; Trying out a line of reasoning.	"How about a different reading of that passage..." "Maybe..."
Requesting Clarification	Seeking clarity about another's statement or question.	"Are you suggesting that..."

<b>Strategy</b>	<b>Working Definition</b>	<b>Discussion phrase(s)</b>
Admitting Difficulty	Acknowledging one's own lack of understanding to the rest of the group.	"I'm still trying to figure out..." "I'm struggling to understand..."
Initiating	Instituting a new direction in the learning conversation.	"If I may move the conversation in a slightly different direction..."
Paraphrasing	Expressing another's thought in slightly different language with the intention of clarifying.	"What I hear you saying is..."
Summarizing	Listing main points, general ideas by way of review.	"Listening to what everyone has been saying, I hear some big themes..."
Defining	Offering definitions of words used by others or supplying terms to fit definitions or descriptions used by others.	"So with the term ____, I assume you mean..."
Noting Relationship Among Tasks & Texts	Making explicit connections between previous conversations, texts and/or learning activities and the ideas of the present conversation.	"I want to connect that comment to our earlier discussion of..."
Activating Background Knowledge	Making explicit connections with prior knowledge and/or experiences outside of the classroom.	"This scene/character reminds me of a time when..." "Your writing makes me remember..."