An Examination of Teachers’ Writing Practices After Common Core Standards:

Is Writing “In?”

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Abstract

The Common Core States standards call for students to be college and career ready and set high expectations for K-12 learners and their teachers. The purpose of this paper was to investigate elementary teachers’ time devoted to writing, instructional practices, their use of technology, and differentiation practices in writing after the Common Core State Standards Initiative. Participants were 39 teachers who attended Master-Level courses in two different Universities at two different states in the Mid-Atlantic region. Teachers’ responses suggest that there has not been a change in their writing practices regarding genre, use of technology, instruction of writing processes, and tasks. Further, teachers shared that they lacked resources to support their instruction and prepare students for 21st century demands.

Keywords: writing practices, elementary teachers, writing, differentiation, technology
Introduction

Writing is a complex cognitive (Hayes & Flower, 1980; Bereiter & Scardamalia, 1987) and social task (Shaughnessy, 1977; Schultz & Fecho, 2000). As a cognitive task, it focuses on the individual and is limited by psychological processes (McCutchen, 2000; 2006). As a social task, it is shaped through interactions between readers and writers (Cole & Engestrom, 1993; Shaugnessy, 1977; Prior, 2006; Nystrand, 2006). Expert writers are able to negotiate between those demands and manage their time as they consider both the rhetorical task and the demands of the audience (Bereiter and Scardamalia, 1986). However, developing writers or novice ones may not be as able to respond to the writing challenges and may gradually develop negative feelings toward writing (Pajares, 2003).

Teachers also find the teaching of writing challenging and their confidence can affect their writing practices (Graham, Harris, Fink & MacArthur, 2001). Unfortunately, many teachers report being ill-prepared to teach writing (Kiuhara, Graham, & Hawken, 2009; Philippakos & Moore, in press) and there is little in the way of systematic professional development programs for preparing teachers to teach writing (McCarthey, & Geoghegan, 2016). When teachers lack proper training and knowledge, they lack self-efficacy and their instruction can suffer (Stein & Wang, 1988), which in turn may affect students negatively (Bruning & Horn, 2000).

Unfortunately, writing has not received a lot of attention across educational policies with the exception of the Common Core State Standards (CCSS, 2010). The standards emphasized writing instruction and also set goals for instruction that addresses reading and writing connections. The purpose of this article is to describe elementary teachers’ time, writing
practices after the CCSS, their use of materials and technology, and their instructional adaptations.

**Common Core State Standards**

The CCSS (2010), provided an expectation for writing competence upon student’s high school graduation and College entry. For college and career readiness, students should know how to read and write for different genres, how to respond in writing to questions that require them to extract evidence from a text or multiple texts, how to apply the writing process flexibly in order to achieve specific writing goals, how to use technology to facilitate the writing process, and how to satisfy the demands of an intended audience. The new standards require students to think critically and make strategic decisions about what to write in response to specific questions. Consequently, for all students to be college and career ready, classrooms should provide instruction that supports students’ understanding about how to flexibly apply the writing process, how to write for different genres and subgenres, how to address different audiences, and how to write about content that is read.

**Effective Writing Practices**

Comprehensive research studies and reviews provided instructional recommendations for teachers in grades K-5 and 4-12 (Graham, McKeown, Kiuhara & Harris, 2012; Graham & Perin, 2007; Graham, Bolinger et al., 2012). Graham, Bolinger and colleagues (2012) released a practice guide for the What Works Clearinghouse (WWC) with five recommendations on writing instruction for grades K-5. The recommendations were reached after a careful review of 41 studies that met the WWC Standards. The level of evidence per recommendation was also identified from this review indicating the need for additional research in specific areas:

1. Provide daily time for students to write (minimal evidence).
2. Teach students to use the writing process for a variety of purposes (strong evidence).

3. Teach students to become fluent with handwriting, spelling, sentence construction, typing, and word processing (moderate support).

4. Create an engaged community of writers (minimal support).

Literature that speaks to the value of technology in writing is important to consider given the context of the CCSS. Technology provide cognitive and social benefits to writers. Purcell, Heaps, Buchanan, and Friedrich (2013) found that technology can motivate writers. Technology has also proven to be a useful tool for supporting writing development. For example, word processors can support the revision process (Graham, MacArthur, & Fitzgerald, 2013; Harper, 1997). Finally, technology can be used to support collaborative writing, peer revision, and provide authentic audiences for writers (Suwantarathip & Wichadee, 2014; Zhou, Simpson, & Domizi, 2012).

A meta-analysis by Graham and Perin (2007) of 123 experimental studies identified 11 instructional elements that had evidence of effectiveness in grades 4 to 12: 1) Writing Strategies ($d = .82$), 2) summarization ($d = .82$), 3) collaborative writing ($d = .75$), 4) specific product goals ($d = .7$), 5) word processing ($d = .55$), 6) sentence combining ($d = .5$), 7) prewriting ($d = .32$), 8) inquiry activities ($d = .32$), 9) process writing approach ($d = .32$), 10) study of models ($d = .25$), and 11) writing for content learning ($d = .23$).

A closer examination of the research recommendations across grades K-12 and of the CCSS suggests that there are commonalities between the CCSS and research-based recommendations. Students should be supported in writing instruction that addresses writing for different purposes and audiences, provides opportunities for collaboration among peers across the writing process, and for writing about information that is read. Further, students should be
taught the writing process and strategies to complete its different steps. In addition, they should be taught skills such as handwriting, spelling, sentence combining, and typing to clearly express intended meanings, present, and organize their ideas. Throughout, technology could be integrated to facilitate writing processes and transform products.

**Teachers’ Practices**

National surveys have described teachers’ writing instruction (e.g., Cutler & Graham, 2008; Gilbert & Graham, 2010), their practices, and beliefs about writing. These surveys suggest that writing is a challenging subject for teachers and students. These challenges can be summarized under the following categories: time allotted to writing instruction, use of technology, and writing practices.

**Time.** Earlier surveys by Graham, Harris, Fink-Chorzempa and MacArthur (2003) as well as more recent surveys by Cutler and Graham (2008) and Gilbert and Graham (2010) suggest that limited time is devoted to writing instruction. The findings by Graham, Harris, Fink-Chorzempa and MacArthur (2003) found that teachers spent 36 minutes a day on writing. Similarly, Cutler and Graham (2008) reported that primary grades teachers spent 21 minutes a day and Gilbert and Graham (2011) reported that students on grades 4-6 spent 24 minutes writing.

**Technology.** A survey by Kiuhara, Graham, & Hawkins (2009) with high-school students suggested that teachers used technology for students to complete writing tasks less than once a month. In the study by Gilbert and Graham (2008) approximately 18% of teachers in Grades 4 to 6 reported using word-processing several times a year and only 2% several times a day, while 42% of primary grades teachers (Cutler & Graham, 2008) reported never to use a computer for writing instruction.
**Writing practices.** An examination of teachers’ writing practices suggests that there is a wide range of tasks completed across grades and a variety of instructional emphasis by classroom teachers. Primary grades’ teachers (72%) reported to use a process approach to writing and that 56% of their instruction was devoted to whole group meetings. Further, a greater emphasis was given to story writing (96.1%) and to the use of worksheets (86%) than persuasion (36%) or informative writing (59%). Approximately 3% of teachers in grades 4 to 6 used a process approach several times a year, 13% taught strategies for planning and 13% taught strategies for revising. Approximately 30% of the teachers reported to include the use of models in writing. Further, 46% of teachers reported working on story writing several times a year, 51% working on personal narratives, 71% working on persuasion, and 26% writing in the content areas.

Even though the CCSS and research recommendations suggest that attention should be given to writing instruction and sufficient time be to the use of technology in writing, classroom practices-as indicated in teacher surveys-suggest that stronger emphasis should be given to these areas. However, such surveys that examined teachers’ practices were conducted prior to the CCSS. Considering that the standards have been in effect since 2010 across many states in the U.S. and that writing is an important literacy task that can determine college and career success, it is imperative to examine teachers’ writing practices, their current use of time to on writing, and their efforts to differentiate instruction in order to support all learners. This pilot work attempts to answer the following: What are teachers’ writing practices, use of technology, time on writing, and differentiation practices, and what changes have occurred (if any) after the CCSS?
Methods

Participants and Context

Participants were 39 classroom teachers across two states of the Mid Atlantic Area (n = 39 female). Participants attended Master’s level courses in a Master’s in Reading program and in a General Education program on two four-year colleges. Overall, 92.3% of the participants were Caucasian/White, 5.1% were Hispanic/Latino, and 2.6% were Asian. It should be noted that participants were also middle and high school teachers, but in this work only responses by elementary teachers are included (n = 39).

Data Sources and Analysis

All participants were invited via informed consent to participate in an online survey that included a total of 167 items (multiple choice and short responses). The survey included four sections: (a) participants’ demographics, (b) professional development experiences and needs, (c) writing practices, and (d) preparation for new assessments. Items in this survey were based on previous teacher surveys (Cutler & Graham, 2008; Gilbert & Graham, 2010) and additional items were developed. Only results on teachers’ use of writing materials, instructional practices, and differentiation are reported here. Information on professional development experiences and needs is reported elsewhere (Philippakos, & Moore, in press). Finally, participants were asked to participate in a brief follow-up, nondirective (Weiss, 1995) interview. Five participants indicated interest. Interviews were audiotaped and transcribed. Transcriptions were examined for accuracy by two research assistants who were not aware of the study’s purpose. Responses to the multiple choice questions were analyzed quantitatively, while open responses were analyzed qualitatively. Specifically, a deductive analysis of patterns on open responses was conducted (Strauss & Corbin, 1998). Interview data were analyzed by examining patterns and themes (Weiss, 1995).
Procedures

Data were collected through the Universities’ secure systems. Students’ responses were exported into a secure excel file that was later shared with the researchers. Participants were provided with two reminders during the duration of the study via the Universities’ technology center. The study was completed within 20 days. Participants who had indicated interest to participate in a follow up interview were contacted and meetings were scheduled within two weeks after the end of the survey.

Results

Time

Regarding the use of time to teach writing, the majority of teachers spent less than 3 hours a week (64.2%) in teaching writing and on average their students spent less than 3 hours weekly (66.8%) writing.

Change on time. The majority of teachers reported not having made any changes on the time allotted to the teaching of writing after the CCSS (64.1%) while 20.5% reported spending less time teaching writing. Regarding the time students spent to complete writing tasks, 59% of teachers reported no changes after the standards but 30.8% of the teachers shared they noticed a decrease in the time their students spent writing across an instructional week.

Differentiation

When teachers were asked if they differentiated their writing instruction, a little more than half explained that differentiation took place for students who had identified disabilities (59%). Other teachers shared that they made any possible effort to differentiate (28%), but did not provide specific detail about those efforts, and others explained that they differentiated only
for spelling and grammar (10.3%). Only a small percentage of participants did not differentiate (2.6%).

In order to better understand what teachers meant by differentiation, we asked them to define the term. Their responses reflected the understanding that differentiation meant instructional adjustments to meet students’ needs. As one of the teachers stated,

“Differentiation in writing would be to meet the needs of each writer in your classroom by scaffolding your instruction either with the way you present information, the quantity of writing needed to be produced, or the structure.”

Some teachers elaborated on their explanations in an effort to clarify the scaffolds they provided. Their explanations primarily referred to (a) materials, (b) expectations and procedures, and (c) instructional arrangements. With regards to materials, teachers mentioned the use of different graphic organizers, the use of sentence starters, and/or the use of a paper that had different formats (e.g., differently lined paper). One of the teachers said,

“My classroom has different papers for the students to write stories. For example, one kind of paper has 1 line, another kind has 2 lines, etc. I also have letter strips with letter formation and picture cues for each letter sound that some students use.”

When referring to expectations and procedures, teachers mentioned adjustments of expectations according to students’ writing skills and abilities. One of the teachers explained that differentiation here referred to, “The amount of assistance and guideline a student has.”

In reference to instructional arrangements, teachers primarily mentioned group arrangements (26.3%) and the use of conferences (52.6%). In an effort to explain grouping procedures, one of the teachers explained,
"You need to pair students who can benefit from working with one another during the evaluation and revision stage. This also means that setting an expectation for length is just pigeon-holing them into a situation where they will not feel successful. Students may need assistance in small group settings to complete a collaborative paper instead of one, independently."

Meeting with students in conferences was the main avenue of differentiation for some teachers. One of them shared, “Other than conferencing with students based on their needs, I am not sure how to differentiate my writing instruction.”

Nevertheless, differentiation was described to be a challenging task for teachers. Even though they explained its importance and necessity, some responses indicated the frustration they felt in their effort to support all their students and their needs. As one of the teachers said, “We differentiate for every subject. It’s overwhelming. There should be more than one teacher in a room for all we are expected to do.”

**Instructional Materials**

The majority of teachers reported that they did not use a commercial program for the teaching of writing (61.5%). Teachers who did use a commercial program referred to a variety of writing programs their school used (e.g., Writing Fundamentals, Units of Study) or to a Basal that included writing (e.g., Wonders, Harcourt). However, even when programs were available, teachers reported having incomplete resources. For example, one teacher stated, “I suppose following Teacher’s College is a program but many units have no book to follow.” Another teacher also described the lack of complete resources, “[We use] Writing Fundamentals, somewhat. We only have 3 out of the 6 available units and are told to use them as a resource rather than a program in its entirety.” One teacher expressed her challenge in understanding
how to utilize the provided resource, “*We were given the Lucy Calkins materials. However, they were never built into the curriculum that they hired an outside company to write. To be honest, mine is still shrink-wrapped in my closet.*”

When teachers were asked to explain what additional resources they used in the teaching of writing, they primarily stated that they created their own materials or the work that other teachers had developed. For example, some mentioned district-level provided resources that were developed by a team of experienced teachers. Finally, they referred to the use of resources that were specific to editing and grammar, Internet resources, mentor texts, and read alouds, but did not provide details about how these were used. Overall, teachers primarily discussed their input in developing their own resources for writing instruction. As one of the teachers stated, “*we just have to be super creative.*”

**Change on instructional materials.** The majority of teachers stated that the resources they used had not changed after the introduction of the CCSS (71.1%). The small percentage of teachers who did indicate some change in instructional materials after CCSS, referred to their attempt to align the current practices to the CCSS. As one of the teachers stated,  

> “*There was no great curriculum in place before the CCSS but I guess it’s better than it was before; however, the amount of work in form of assessments and supplementing curriculum makes the current practices very difficult.*”

**Assessment Material and Change**

Regarding the use of resources used for assessment purposes, 68.4% of teachers reported not having any differences in the materials used for assessment purposes after the standards. The majority of teacher who did report changes in resources used for assessment purpose mentioned
the inclusion of rubrics to assess students’ writing performance. The origin of those rubrics varied. Some teachers reported using 6+1 rubrics in the past instead of district-developed rubrics after CCSS and other reported using 6+1 rubrics after CCSS. The way in which teachers were supposed to utilize the new rubrics seemed to be unclear to some of them. One stated, “To wrap my mind around the new assessment rubrics I try to use them to score many writing samples throughout the year.” However, teachers reported that they had not made any changes in the use of writing assessments.

Students’ Collaboration and Use of Word Processors

Teachers were asked to report the frequency that their students collaborated during the writing process, on their use of a word processor, and on their completion of prewriting activities (See Table 1). The distribution of responses indicated a higher frequency on the completion of collaborative tasks several times a month and several times a year. Prewriting activities were completed at a higher frequency several times a month and weekly. However, teachers reported at a higher frequency that students never completed writing assignments on the word processor (51.3%).

Change on students’ application of specific approaches. No change was evident on teachers’ responses. Regarding change that occurred after the application of the CCSS, the majority of teachers reported that there were no changes on the frequency of collaboration tasks, of prewriting tasks, and of the use of the word processor (69.2%, 71.8%, and 53.8% respectively).
Table 1

*Students’ Applications: Collaboration, Word Processing, and Prewriting*

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Never (%)</th>
<th>Several Times a Year (%)</th>
<th>Monthly (%)</th>
<th>Several Times a Month (%)</th>
<th>Weekly (%)</th>
<th>Several Times a Week (%)</th>
<th>Daily (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collaboration in planning,</td>
<td>12.8</td>
<td>23.1</td>
<td>12.8</td>
<td>23.1</td>
<td>12.8</td>
<td>7.7</td>
<td>7.7</td>
</tr>
<tr>
<td>drafting, revising and editing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use of Word processor</td>
<td>51.3</td>
<td>25.6</td>
<td>2.6</td>
<td>7.7</td>
<td>7.7</td>
<td>5.1</td>
<td>0</td>
</tr>
<tr>
<td>Prewriting activity</td>
<td>5.1</td>
<td>12.8</td>
<td>17.9</td>
<td>25.6</td>
<td>23.1</td>
<td>10.3</td>
<td>5.1</td>
</tr>
</tbody>
</table>

n = 39

**Instructional Practices**

Teachers were also asked to report the time allotted on instructional practices (See Table 2). Their responses across the different practices showed a lot of variability for the majority of questions. Specifically, the use of the writing process approach was reported several times a year with 23.1%, and weekly with 17.9%. Also, a relatively large percentage of teachers used direct methods to teach grammar skills (23.1% weekly and 28.2% daily); however, 20.5% of teachers did not ever teach sentence combining strategies. Only 25.6% taught such strategies several times a month. Students were also taught how to self-evaluate their work several times a month (28.2%) while 10.3% never taught students to do so.
Finally, a relatively large percentage of teachers indicated that they did not write while their students wrote (28.2%) and 20.5% that they did not teach writing as a tool for learning content while inquiry was taught by almost half of the participants several times a year (51.3%).

Table 2

*Instructional Practices*

<table>
<thead>
<tr>
<th>Strategies</th>
<th>Never (%)</th>
<th>Several Times a year (%)</th>
<th>Monthly (%)</th>
<th>Several times a month (%)</th>
<th>Weekly (%)</th>
<th>Several times a week (%)</th>
<th>Daily (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process approach</td>
<td>5.1</td>
<td>23.1</td>
<td>10.3</td>
<td>15.4</td>
<td>17.9</td>
<td>15.4</td>
<td>12.8</td>
</tr>
<tr>
<td>Sentence Combining</td>
<td>20.5</td>
<td>17.9</td>
<td>15.4</td>
<td>25.6</td>
<td>12.8</td>
<td>2.6</td>
<td>5.1</td>
</tr>
<tr>
<td>Inquiry</td>
<td>12.8</td>
<td>51.3</td>
<td>7.7</td>
<td>10.3</td>
<td>12.8</td>
<td>0</td>
<td>5.1</td>
</tr>
<tr>
<td>Study and imitate models</td>
<td>10.3</td>
<td>25.6</td>
<td>12.8</td>
<td>17.9</td>
<td>15.4</td>
<td>10.3</td>
<td>7.7</td>
</tr>
<tr>
<td>Writing of paragraphs</td>
<td>17.9</td>
<td>10.8</td>
<td>10.3</td>
<td>7.7</td>
<td>17.9</td>
<td>15.4</td>
<td>0</td>
</tr>
<tr>
<td>Students assess their own writing</td>
<td>10.3</td>
<td>17.9</td>
<td>10.3</td>
<td>28.2</td>
<td>17.9</td>
<td>5.1</td>
<td>10.3</td>
</tr>
<tr>
<td>performance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Writing as a tool for learning content</td>
<td>20.5</td>
<td>7.7</td>
<td>5.1</td>
<td>23.1</td>
<td>17.9</td>
<td>12.8</td>
<td>12.8</td>
</tr>
<tr>
<td>Use of direct instructional methods to teach basic writing skills</td>
<td>2.6</td>
<td>7.7</td>
<td>12.8</td>
<td>10.3</td>
<td>15.4</td>
<td>23.1</td>
<td>28.2</td>
</tr>
<tr>
<td>Write in class while students’ write</td>
<td>28.2</td>
<td>15.4</td>
<td>5.1</td>
<td>12.8</td>
<td>10.3</td>
<td>15.4</td>
<td>12.8</td>
</tr>
</tbody>
</table>

n = 39
Change on writing practices. Regarding change, the majority of responses indicated that there was no change after the implementation of the CCSS on their writing practices (See Table 3). Further, when teachers were asked if their practices in general had changed after the CCSS 64.1% responded negatively. Teachers who shared that there were changes referred to changes on expectations and on specific practices. Teachers stated that there was a stronger focus on reading and writing connections and an emphasis on content-area writing. As one teacher said,

“We used to teach writing in parts starting with sentence formation and paragraphs. Now, we just tell them to write and have to ‘teach in’ to the ones who need more support. As a result, they all write a lot, but all struggle with grammar conventions and proper sentence formation.”
Table 3

<table>
<thead>
<tr>
<th>Strategies</th>
<th>I do not teach this (%)</th>
<th>Less time (%)</th>
<th>No Change (%)</th>
<th>More time (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process approach</td>
<td>5.2</td>
<td>15.4</td>
<td>66.7</td>
<td>12.8</td>
</tr>
<tr>
<td>Sentence Combining</td>
<td>10.3</td>
<td>10.3</td>
<td>61.5</td>
<td>17.9</td>
</tr>
<tr>
<td>Inquiry</td>
<td>2.6</td>
<td>12.8</td>
<td>59.0</td>
<td>25.6</td>
</tr>
<tr>
<td>Study and imitate models</td>
<td>0</td>
<td>20.5</td>
<td>64.1</td>
<td>15.4</td>
</tr>
<tr>
<td>Writing of paragraphs</td>
<td>12.9</td>
<td>10.3</td>
<td>66.7</td>
<td>10.3</td>
</tr>
<tr>
<td>Students assess their own writing</td>
<td>2.6</td>
<td>7.7</td>
<td>69.2</td>
<td>20.5</td>
</tr>
<tr>
<td>Writing as a tool for learning</td>
<td>5.1</td>
<td>10.3</td>
<td>69.2</td>
<td>15.4</td>
</tr>
<tr>
<td>Use of direct instructional methods to teach basic writing skills</td>
<td>0</td>
<td>5.1</td>
<td>71.8</td>
<td>23.1</td>
</tr>
<tr>
<td>Write in class while students’ write</td>
<td>18</td>
<td>5.1</td>
<td>66.7</td>
<td>10.3</td>
</tr>
</tbody>
</table>

n = 39

Instruction on Skills

Teachers were asked to report the frequency of teaching spelling, handwriting, and typing (See Table 4 for the number of teachers at each frequency level). The majority of responses indicated that a large percentage of teachers worked on spelling weekly (35.9%), while a considerable percentage of teachers never taught handwriting and typing (28.2 and 74.4%, respectively).
Table 4

Instruction on Skills

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Never (%)</th>
<th>Several Times a year (%)</th>
<th>Monthly (%)</th>
<th>Several times a month (%)</th>
<th>Weekly (%)</th>
<th>Several times a week (%)</th>
<th>Daily (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spelling</td>
<td>10.3</td>
<td>0</td>
<td>0</td>
<td>2.6</td>
<td>35.9</td>
<td>10.3</td>
<td>41</td>
</tr>
<tr>
<td>Handwriting</td>
<td>28.2</td>
<td>10.3</td>
<td>5.1</td>
<td>15.4</td>
<td>15.4</td>
<td>12.8</td>
<td>12.8</td>
</tr>
<tr>
<td>Typing</td>
<td>74.4</td>
<td>5.1</td>
<td>2.6</td>
<td>2.6</td>
<td>15.4</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

n = 39

Change on instruction of skills. The majority of teachers did not report any changes after the CCSS on the instruction of those specific skills (65.8%, 51.3%, 94.7%, respectively). The most surprising finding on teachers’ responses referred to the teaching of typing skills. A large percentage of teachers did not teach typing prior or after the CCSS.

Instructional Tasks

Regarding working on specific writing activities (See Table 5) teachers reported at a higher frequency not to ever teach specific tasks such as journal writing (20.5%), plays (66.7%), autobiography (69.2%), biography (51.3%), copying of text (53.8%), writing newspaper articles (65.85), email (92.1%) and step-by-step instructions (42.1%). Expository texts were reported to be taught several times across a year as well as fiction and reports (e.g., research reports with 66.7%). Persuasive writing was taught at a high frequency across the year and several times a month, but it was not a practice that teachers reported working on weekly, or several times a week or daily. Contrary to this, story writing and personal narrative had a wider distribution across time.
Table 5

*Instructional Tasks*

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Never (%)</th>
<th>Several Times a Year (%)</th>
<th>Monthly (%)</th>
<th>Several times a Month (%)</th>
<th>Weekly (%)</th>
<th>Several times a Week (%)</th>
<th>Daily (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Story writing</td>
<td>5.1</td>
<td>51.3</td>
<td>12.8</td>
<td>10.3</td>
<td>5.1</td>
<td>10.3</td>
<td>5.1</td>
</tr>
<tr>
<td>Personal narratives</td>
<td>2.6</td>
<td>50.0</td>
<td>12.8</td>
<td>7.7</td>
<td>5.1</td>
<td>7.7</td>
<td>5.1</td>
</tr>
<tr>
<td>Journal writing</td>
<td>20.5</td>
<td>5.1</td>
<td>5.1</td>
<td>17.9</td>
<td>12.8</td>
<td>12.8</td>
<td>25.6</td>
</tr>
<tr>
<td>Poetry</td>
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Change on instructional tasks. Teachers responses (See Table 6) did not indicate a change in the frequency of instruction after the CCSS.
Table 6

Change on Instructional Tasks

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<th>Tasks</th>
<th>I do not teach this (%)</th>
<th>Less time (%)</th>
<th>Same Time (%)</th>
<th>More time (%)</th>
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Closer Examination of Practices via Interviews

Overall, all teachers reported having adequate technological resources for teaching. Examples of such resources were an Interactive smartboard, Elmo, Promethean board, Mimo, Optiplates, Activotes. However, teachers explained that those were primarily used as presentation tools and did not utilize those in writing. Two of the teachers said that they used the Smartboard as part of the Morning message. Only one teacher said that she would use the board to type her work,

“I would type my rough draft and you know make mistakes on purpose [and] leave them there. They don’t know how to research they don’t know how to find good research and it was nice because I could put files right on the shared drive with kid-safe websites or if we were making a comic strip I could put the link right there and so I would show them all of that on my board. Then I use the ELMO once we got into edit and revise to show them student samples. I would pick some of the kids that I knew would need the support more. And then I would do my own, [and I would say,] even I have mistakes so don’t rush through this.”

When participants were asked how they used this technology to teach writing, they seemed uncertain in their responses. As one teacher shared,

“I don’t feel like there is anything available or I’m not aware of how to use it, or what to use. So it is combination of those things. I’m sure there are things available that I am not aware of maybe.

In general, though, teachers seemed to use technology to present information to students. One of the third grade teacher explained that she would use the Smartboard to show editing and
revising. She also said that she asked students to work on editing and revising and to give them some practice in preparation for the new assessment that required students to work on a computer. However, this same teacher explained that for security purposes, the computers were not available to students for a while and they were not able to practice from several months in the spring,

“The real big problem we have ran into is all the computers needed to be locked because when they got them ready for PARCC[and] the firewalls had to be disabled. So then they were afraid that kids could access like inappropriate information. So from February 1, until basically the last week of May the computers were unavailable”

All teachers had from one to five computers in their classrooms for students to use. Only one teacher had only one computer and only one other had five. The rest had two to three. However, not all had access to computers for all their students. Two third grade teachers reported having laptop carts available. One of them shared that the school had 4 laptop carts. The other teacher explained that the school only had one cart that was expected to be shared across the K-5 classrooms and teachers. This teacher shared that she used that cart extensively during the year, and she had asked her students to type their work. The third third-grade teacher teacher explained that there was a computer lab available, but she did not have time to use it and take her students there to write or to practice writing. The Kindergarten teachers only reported having two to four computers in their classrooms for their students to use.

Teachers overall acknowledged the need for students to work on computers. One of the third-grade teachers shared,
\textit{“Well if we had more [computers] I think the kids love working on the computer. I think it would definitely help with motivation, definitely help with motivation. I think there is a lot out there, websites that use practice, and practicing those skills could definitely be enhanced with the technology.”}

Four of the teachers explained that they were not able to use the computers on a daily basis because not every student always had access to computers and in some cases students’ typing skills were low. Considering the possibilities for active manipulation of text that technology (such as the Promethean Board or even the Elmo) provide, teachers only used the available technology to present the information to students or to demonstrate. However, this technology was not used as a means to manipulate information and allow students to coconstruct information.

\textbf{Discussion}

The National Commission on Writing in American Schools and Colleges (2003) thirteen years ago called for a policy that would,

\textit{“aim to double the amount of time most students spend writing, require a writing plan in every school district, insist that writing be taught in all subjects and at all grade levels, and require successful completion of a course in writing theory and practice as a condition of teacher licensing.”} (National Commission on Writing in American Schools and Colleges, 2003, p. 6).

The Common Core Standards for writing indicated a promising change due to their emphasis in writing and due to their call for writing across the curriculum. However, the findings of this survey suggest that very little has actually changed. For example, in line with previous research (Cutler & Graham, 2008; Cutler & Graham, 2010; Graham, Harris, Fink-Chozampa,
and MacArthur, 2003) that the majority of teachers in this study spent 30 minutes a day in the
teaching of writing and students wrote for only 30 minutes daily. Writing still seems to not have
its own recognition within the English Language Arts block and teachers struggle to find time to
teach it.

Further, research recommended that teachers become a part of an engaged community of
writers in their classrooms (Cutler & Graham, 2008; Graham, et al., 2012). This survey indicates
that teachers do not appear to engage in the writing process alongside of their students. By
participating as members of the writing community, teachers can model writing processes,
knowledge, and self-regulation strategies which and can then, in turn, support their students’
development as writers. In addition, as teachers enter the writing community, students begin to
see them as participants rather than solely evaluators.

In this survey, teachers also reported not to teach students how to type and not to spend
much time using word processors. Unfortunately, teachers reported that they did not have
adequate resources to allow students to use technology to facilitate the writing process. Again,
the National Commission on Writing in American Schools and Colleges (2003) had explained
the necessity to incorporate technology in the writing curriculum even though it had identified
challenges. They stated, “there is no doubt that the resources for technology available to schools
and colleges—including hardware, software, and teacher development—are often inadequate and
frequently unequal” (p. 23). The few teachers who were interviewed indicated that they had
technology to use as a presentation tool, but that their schools did not have enough computers or
other barriers that prevented all students from having access to technology for writing. This is a
finding with great policy implications. Students’ assessments are computerized (e.g., National
Assessment for Education Progress (NAEP, 2011); Partnership for Assessment of Reading for
College and Careers (PARCC)) and policy makers should consider that this may confound student results. If no typing skills are taught, it is not clear how it is expected for students to adequately perform on tasks that require them to type responses. Therefore, such assessments may not reflect the students’ writing ability but only their keyboarding skills.

The instruction on grammar and lower-level skills was a concern for elementary teachers and teachers in this study indicate teaching it on a daily or weekly basis. In fact, direct instruction in basic writing skills had the highest frequency at the daily and several times a week levels. This was above and beyond any other writing instructional practice listed in the survey. Sentence combining is an approach that has yielded statistically significant results (Graham & Perin, 2007; Saddler 2005; Saddler & Preschern, 2007), but instructionally it is not present in classrooms. The participants in this survey did not refer to the use of sentence combining as a means to teach grammar. In addition, we wonder whether teachers’ schemas for teaching writing are primarily focused on teaching grammar since this was a practice reported with great frequency. Teacher preparation and professional development programs should target evidence-based methods of grammar instruction and also clearly articulate the role of grammar in the larger writing process.

Teachers also reported challenges with differentiation of instruction and assessment. Teachers used one-on-one writing conferences as a main way of differentiating instruction, but little research about the effectiveness of writing conferences exists. Research could examine the effects of conferences on students’ abilities not only to make immediate revisions but also transfer this newly acquired knowledge to other settings and tasks. Teachers reported using rubrics to assess student writing, but still they had difficulty understanding how to use these. Clearly, teachers need an assessment system that is accompanied by ongoing professional
development so that they can successfully implement and use these tools to drive their instruction to meet individual student needs.

Teachers also reported that they created their own materials or borrowed the work of other teachers. The reason they did this was because they either lacked a writing curriculum or because they did not have training on how to implement the curriculum their school purchased. Even though professional collaboration is necessary for the progression of a profession, the quality of what is shared and what is created was unknown. Considering that teachers report being ill-prepared to teach writing (Cutler & Graham, 2008; Gilbert & Graham, 2011) and that teachers of this sample also shared that they were not prepared to teach writing upon their graduation (Philippakos, & Moore, in press), the resources may not be as effective or as connected to research recommendations. Again, teachers deserve more support in developing and implementing a writing curriculum especially if the expectations for writing have significantly increased.

**Limitations and Future Research**

There are several limitations to this work that should be addressed. First, the sample is very small and generalizations cannot be made. Second, the analysis would have been more informative if it had reported findings for two bands of teachers: K-2 and 3-5; however, the sample was too small for this type of analysis. Third, the survey did not include questions on reading and writing connections or content area writing. This is an important limitation that could lead to revisions of the current survey. The CCSS set a clear expectation for writing across the curriculum; therefore, this is an important question that needs to be answered.

Nevertheless, this is a pilot that can inform the survey and lead to revisions. Revisions to the current study could lead to a larger scale examination of teachers’ current practices and their
perspectives on changes after the implementation of the CCSS. It is important to ask the question, “What are teachers’ practices after the CCSS?” Also, given the CCSS focus on writing within the content areas, it is important to examine how and if teachers incorporate writing across the curriculum. This survey focused solely on writing within the ELA classroom. In addition, we recognize the limitation of self-report. Future research could examine (a) teachers’ responses to a survey that investigates their practices, (b) interviews of participants in order to corroborate their responses to the survey, and (c) also sample completed writing assignments. That way there would be a possibility to examine teachers’ practices and students’ performance without costly direct observations. Finally, we acknowledge that teacher leaders play a role in school change and improvement. This study targeted teachers. It is also important to understand teacher leaders’ perspectives in promoting change in response to policy initiatives.

This study took place across two states and University systems. The findings are limited to the settings and may reflect specific policies and decisions that were made to support (or not) teachers in the implementation of the CCSS for writing. It would be interesting in future work to also examine the specific policies and supports at a state or county/district level that were provided to support teachers in their writing instruction.

**Closing Thoughts**

We would like to close with the first lines of the 2003 Executive summary of the neglected R report,

> “American education will never realize its potential as an engine of opportunity and economic growth until a writing revolution puts language and communication in their proper place in the classroom” (National Commission on Writing in American Schools and Colleges, 2003, p. 6).
It is unfortunate that this revolution may still not be in place or perhaps there is more work that needs to be done in the American classrooms in order to manage a writing revolution. Writing should be “In” the ELA schedule and should not need to compete for its place in students’ learning and teachers’ literacy instruction.
References


Nwp@nwp.org.


AN EXAMINATION OF TEACHERS’ WRITING PRACTICES AFTER

Handbook of writing research (pp. 275-290). New York: Guilford Press.


ASSESSMENT OF COMPREHENSION BY
STANDARDIZED, NORM-REFERENCED TESTS

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E. SUTTON FLYNT
University of Georgia

Standardized, norm-referenced tests are prominent parts of most evaluation programs used to assess progress in reading. Though results are used along with other data about student progress, scores on standardized, norm-referenced tests are highlighted in discussions about reading progress. Some federal programs in the past have mandated that these tests be a major part of program evaluation. Reports of reading progress—or lack of progress—of states and school systems published in newspapers and periodicals usually are based upon results of these tests. Farr, Tuinman, and Rows (1974) and Harnischfeger and Wiley (1976) concluded that reading achievement has either decreased gradually or leveled off. More recently, Farr, Fay, and Negley (1978) reported that students in one state were reading better in 1976 than students of comparable grades 30 years earlier when adjustments were made for age differences. Cooperman (1978), on the other hand, criticized the effectiveness of reading instruction. All of these—and many other studies—utilized data gathered from use of standardized, norm-referenced tests.

An implication that can be drawn from a closer look at data on reading achievement trends is that a more effective job likely is being done in teaching word recognition skills than in teaching comprehension (Aaron, 1978). A recent study by Durkin (1979) contends that very little teaching time is being devoted to reading comprehension. Although Durkin’s findings may or may not be typical of teachers as a whole, comprehension is what reading is all about, and that is why the focus of this study is on comprehension.

Information about comprehension tests should be useful to evaluators, teachers, researchers, and administrators. Test users need to know what tests measure and how they measure it. Further, a comparison of tests will provide more insight into why results obtained from different publishers’ tests differ. A study of test items will also help users compare skills assessed by tests with skills taught in basal materials used in their own schools or systems. This latter area of concern becomes more important in view of the current practice of using some standardized, norm-referenced tests as if they were criterion-referenced tests. Lastly, agreement on exactly what make up comprehension is hard to come by, but whatever it is, everybody believes in it.

Purposes of the Study

This study aimed toward learning more about how reading comprehension is assessed by five widely-used standardized, norm-referenced tests of reading comprehension. The five tests examined were the California Achievement Test (CAT), Levels 12-19 (1977); Gates-MacGinitie Reading Tests (G-M), Levels C-F (1978); Iowa Test of Basic Skills (ITBS), Levels 7-14 (1978); Metropolitan Achievement Test (MAT), Levels Primary II—Advanced II (1978); and the Stanford Achievement Test (Stanford), Levels Primary II—Advanced (1973). Specific purposes were to analyze the passages and items on the comprehension subtests of the five selected tests in terms of the discourse form (narrative, expository, descriptive, and argumentation) of the passages on which the items were based, the comprehension level assessed (literal, inferential, and evaluative), the comprehension skills assessed, the estimated readability of each passage, and the length of the passages on which the items were based. In addition, the investigators made inter-test comparisons on each of the aforementioned points at the fourth and eighth grade levels.

The Anchor Test Study (1974) was carried out because it was recognized that widely used standardized, norm-referenced tests differed considerably in measuring units and in what they measured. This project established interchangeable norms among eight widely used tests so users could present with one test and posttest with another publisher’s test. However, since 1974, all eight tests examined during the Anchor Test Study have been substantially revised.

In the present study, the focus is placed on the latest versions of the reading subtests that assess comprehension in five of the eight standardized, norm-referenced tests used in the Anchor Test Study. All of these tests also assess decoding skills and meaning vocabulary; however, no effort was made to examine any subtests other than those assessing comprehension. The researchers recognize the importance of the other subtests, but they were most interested in comprehension for reasons previously mentioned.

Procedures

Throughout the examination of the comprehension subtests of the five standardized, norm-referenced tests, the two researchers worked independently of each other in classifying each selection and/or item in terms of discourse form, comprehension level, comprehension skill being assessed and length of selection. Then meetings were held to compare findings and arbitrate differences where necessary.

Discourse Form

The selections were categorized initially into the two broad categories of poetry or prose. Then all selections were categorized into the four traditional forms of narration, exposition, description, and argumentation. The usual definition of discourse form were used as guides (Shaw, 1972; IRA, at press). Often, discourse is a mixture of several forms, but usually one form predominates. In this study the two researchers were able to agree on all passage classifications.

The five tests examined vary widely in amount of the four forms of discourse. Only three of the five tests use poetry and it accounts for a very small number of the passages and items. Four of the tests have few, if any, argumentation passages. Inter-test comparisons at a single level reveal considerable differences in amount of the forms of discourse. Generally, all of the tests, except the California Achievement Test, rely most heavily on narrative and expository passages for assessing reading comprehension. Refer to Table 1 for a
complete summary of the percentages of discourse forms found within each test. Poetry, which is presented in a separate column, also is included in the Description column.

Levels of Comprehension

All items were classified in terms of level of comprehension: literal, inferential, or evaluative. An uncomplicated, straightforward classification scheme was employed. If an item could be answered from information directly stated in the passage, it was considered to be literal. It was deemed unnecessary that the answer be stated in the exact words of the stem and appropriate completion, but it had to be answered clearly in the discourse without requiring use of inference. Inferential items were those in which answers were not explicitly stated in the passage and where evaluation was not involved. In inference, the basis for the answer, all facts needed to determine the correct answer, might be presented in the passage, but to reach the answer the reader must fill in gaps from experience or according to logic. An evaluation item was one in which the reader’s judgment was involved.

The classification scheme used in this analysis is different somewhat from existing taxonomies such as the widely followed taxonomy of Barrett (1976). For example, Barrett’s taxonomy has a fourth category labeled “appréciation.” Further, Barrett’s taxonomy includes recall of main ideas and sequence under literally recognition as well as under inferential. As Pearson and Johnson (1978) point out, main ideas are seldom literal; they must be implied. Similarly, sequence must be inferred unless events or actions are prefaced by words indicating order of occurrences, as “first,” “next,” or “last.”

The five tests utilized in the study vary considerably in how they categorize items, though all tests use the categories of literal and inferential. The California Achievement Test uses literal comprehension, interpretative comprehension, and critical comprehension; the Gates-MacGinitie includes only literal and inferential items; the three categories of the Iowa Tests of Basic Skills are literal meaning (facts), interpretative meaning (inferences), and evaluative meaning (generalizations); the six-way breakdown of the Metropolitan Achievement Test includes vocabulary, literal-specific, literal-general, inferential-specific, inferential-general, and evaluation; and the Stanford Achievement Test divides items into global meaning, explicit meaning, implicit meaning, meaning determined by context, and inferential meaning. The categories used in this study most closely match those of the ITBS, but the subcategories differ somewhat. For example, main idea and figurative language are listed as evaluative meaning rather than as inferential in the ITBS.

Within the levels of a given test, the percentages of literal, inferential, and evaluative items vary widely and appear to follow no particular pattern. Inter-test comparisons reveal considerable differences in percentages of literal and implied items, and only one test gave any substantial attention to evaluation items. The most striking feature, in terms of the levels of comprehension assessed, is that at most levels inferential items far outnumber literal test items. See Table 1 for a breakdown, by test, of the number of items and percentage of items that were at the various levels of comprehension.

Classification of Skills

Currently available materials designed for use in reading instruction and evaluation are, for the most part, based on a skills approach to comprehension. Almost without exception, basal reader series and other published instructional materials, knowingly or unknowingly, are built around the idea that comprehension is made up of skills and abilities, rather than being global or unitary in nature. The same can be said about standardized reading tests and the approaches presented in reading methodology texts.

Classifying test items in terms of the comprehension skill assessed may appear to be a simple task. However, the task is far from simple on some types of items. An item may involve more than one skill, as drawing a conclusion and cause and effect relationship or vocabulary and figurative language. Further, all items could be classified as identifying main ideas or details. Therefore, some hierarchical pattern must be established when undertaking a categorization task of this nature.

In the present study, the researchers, working separately, classified each item on all levels of all subtests into one of nine categories (see Table 2 for the nine categories utilized). Then results were compared and any differences were arbitrated. Occasionally, items were found which tapped more than a single skill, as character’s feeling and drawing a conclusion. Such items were classified under the skill that appeared to be the focus of the item. If an item assessed a skill like character’s feeling or cause-effect relationship which could be answered only by drawing a conclusion, then the item was categorized under the skill other than drawing a conclusion. Any item classified as detail was an item involving something other than a main idea and one that did not fit any other skill category.

With regard to the comprehension skill assessed, only a few comprehension subskills are sampled within a given level of a test. In fact, many reading comprehension subskills taught in basal readers are not assessed in any of the five tests. A comparison of the five tests reveals an emphasis by three of the tests on detail, main idea, and cause-effect items. Four of the five tests have the vast majority of their items falling into these three subskill categories plus drawing conclusions. Only one test reveals a spread across the nine comprehension subskill categories. See Table 2 for the percentages of sub-skills assessed by items on the five tests.

Readability of Passages

Besides investigating discourse form and the levels and skills of comprehension assessed by the five standardized, norm-referenced tests, the researchers investigated the difficulty of the passages upon which the test items were based. Specifically, passage length, sentence length, item density, and readability estimates were studied.

Three readability formulas were utilized to obtain estimates of passage difficulty. The Harris-Jacobsen Readability Formula (1975) was used for test levels designed for third grade or below. This formula was utilized at the primary levels of the five tests because it provides specific grade levels and subdivisions of each grade level through the third grade (i.e., preprimer, primer, first reader). The Fry Readability Graph (1968) was used for test levels at or above the fourth grade. The Dale-Chall Readability Formula (1948) was utilized to spot-check results of the Fry Graph when grade levels obtained were three or more grade levels above or below the test audience. In the case of the Fry Readability Graph, as many 100 word samples as possible were used to obtain an overall passage readability level. For example, a 526 word passage’s readability level was based on five 100 word samples.

Readability estimates reveal that readability levels of selections within a test vary widely and follow no particular arrangement in terms of a progression of difficulty. In addition, readability estimates vary among the five tests at comparable difficulty levels. Table 3, which reveals the
median readability estimates for each level of each test, indicates that for the most part each test level's median readability estimate is at the approximate difficulty level for the intended test audience. However, the range of readability estimates, also provided in Table 3, for each test level discloses a wide disparity in terms of the difficulty of the passages within a given test level. Specifically, the middle levels of the five tests show the widest range of readability estimates, varying from a three grade level range to a twelve grade level range. Refer to Table 3 for a complete summary of the median readability estimates and range of readability estimates for each level of each test.

With regard to passage length, sentence length, and item density, selections vary considerably in length, and selections within a test are not arranged from shortest to longest. Some of the tests have much longer selections than other tests at comparable difficulty levels. Also, the number of selections at a given level vary considerably among the five tests. Item density results also show wide differences among the tests. Table 4 summarizes the findings concerning passage length, sentence length, and item density.

In order to make inter-test comparisons easier for the reader, a comparison of each area investigated was made at the fourth and eighth grades. The results of this comparison are provided in Tables 5, 6, 7, and 8.

Implications

A number of implications may be drawn from the findings of this study. Among those that can be drawn are:

1. Users of standardized, norm-referenced tests should remember that test content varies widely from level to level and from publisher to publisher. Therefore, results on any two given levels of the same test or on two different tests should not be expected to be the same for a student.

2. Almost all levels of the tests contain a higher percentage of inference items than literal. These tests are of limited use in assessing literal and evaluative comprehension.

3. Standardized, norm-referenced tests assess comprehension around brief selections and ask too many questions so that some must be about trivia. The tasks in comprehending important ideas in longer passages (as in short stories or in chapters in textbooks) may be quite different. Performance on one may not be similar to that on another.

4. The lack of a substantial number of evaluative items in these tests leads one to the conclusion that the tests tell little about a student's ability to read critically. In addition, some of the tests give limited attention to assessing literal comprehension. Therefore, some of the tests tell very little about how well students can comprehend literally.

5. Many comprehension skills are not assessed in these tests. Therefore, their usefulness in pinpointing strengths and weaknesses in skill areas is very limited. For instance, the Metropolitan Achievement Test is limited as a "criterion-referenced" test.

6. Most of the tests show "ragged profiles" in terms of sequential "buildup" in passage difficulty. Publishers may need to give closer attention to this aspect of test development.

7. Instructional decision-making and program evaluation should include other sources of information besides standardized, norm-referenced tests for the sake of accuracy.

The results of this study point out the need for teachers, evaluators, researchers, and administrators to study closely the make up of standardized, norm-referenced tests as well as how they measure what they claim to measure. In the past there have been mismatches between institutional goals and outcomes and the instruments used to evaluate those goals and outcomes. Selecting the correct instrument for program evaluation will provide results which will be more relative to what has been taught.

References


### Table 1

**ANALYSIS OF DISCOURSE FORM AND COMPREHENSION LEVEL ON FIVE WIDELY-USED STANDARDIZED, NORM-REFERENCED TESTS, PRESENTED IN PERCENTAGES**

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M1 — Main Idea
D — Detail
V — Vocabulary
C-E — Cause-effect Relationship
DC — Drawing Conclusions
Ch — Character Trait/Action/Feeling
Seq — Sequence Relationship
FL — Figurative Language
*Other Includes: Literary Type
Writer's Purpose
Recognition Fact/Opinion
Propaganda Technique
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*PP = preprimer
P = primer
Table 4

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Table 6

COMPREHENSION SKILLS SAMPLED BY TEST ITEMS AT THE FOURTH AND EIGHTH GRADE, GIVEN IN PERCENTAGES

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*Literary type, writer's purpose, fact/opinion, propaganda
Table 7
READABILITY ESTIMATES OF PASSAGES FOR FOURTH AND EIGHTH GRADES

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* — Poetry
** — Invalid score

Table 8
ANALYSIS OF PASSAGE LENGTH, SENTENCE LENGTH, AND ITEM DENSITY AT THE FOURTH AND EIGHTH GRADE

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Conversations with and About Picture Books: Developing Insiders’ Perspectives

Yong Yu and Robert T. Ackland

State University of New York, Plattsburgh
A Conversation Starts

Two literacy education professors see each other in the hallway.

Bob: Do you have a few minutes? I found this picture book at Goodwill. It’s a story about a Chinese girl and her family. I want to know how accurate and authentic the book is.

Yong: *Ma Jian and the Orange Ants* (Porte & Cannon, 2000)? I’ve never read it before. [She starts reading.] The illustrations look authentic to me. The characters look Chinese, and they all look different—their faces have unique individual features. [She reads more and points at page 26.] Look at this! [She reads the text out loud:] “Imagine that family’s rejoicing! Jiang and her mother and her father and her brothers could hardly stop bowing.” The father was bowing to his daughter? That seems very odd, particularly at the time when the story happened.

Bob: Don’t Chinese people bow to each other?

Yong: Yes. But typically to show respect—the younger to older people, students to teacher, lower to higher authority, service staff to customers, or among colleagues. Parents wouldn’t bow to their children.

Bob: Wow! I wonder if the author knew this.

Yong: Good question! [She searches for information about the author and illustrator in the book.] I wonder how much research the author and illustrator did about Chinese culture when they were creating this book.

Bob: Maybe they didn’t know about the customs of bowing.

Yong: Maybe not. It’s different in different cultures. I think that in Japan, parents might bow to their children. We’d have to look into that further to find out.

Bob: This reminds me of the book called *Basho and the Fox* (Myers & Han, 2000). It’s a beautiful introduction to the haiku of the 17th century poet Matsuo Basho. I showed it to a friend who knows a great deal about Japanese culture and she explained that she is disturbed by the illustrations because some of them show Basho wearing a kimono that is wrapped right-over-left. She told me, “That is the way bodies are prepared at death. In Japan, no living person would ever wear a kimono that way.”

Yong: Interesting.

Bob: I think that through conversations like this we can find out how to help young readers understand some of the complexities of culture. You know, when I was studying in France, I often heard people say, “Je l’ignore.” Literally, it means, “I ignore that.” But it is not a negative thing, and it doesn’t indicate any volition to maintain ignorance. It’s more like saying, in English, “I’m unaware of that.” It draws attention to the fact that an individual
person can’t know everything. It marks places where we can expand our knowledge. The books that teachers select for use in their classrooms may have inaccurate information that is provided by authors, illustrators, or editors. We can still use them—we just need to point out some of the places where they could be improved in regard to the presentation of culture.

Yong: Yes. We need to have conversations that help us understand more about an insider’s view.

Bob: I really like the book *The Librarian of Basra* (Winter, 2005). I took it to a TESOL conference in Dubai and showed it to a group of Iraqi educators. Here’s what they told me: “This book says nothing about her family. Safeguarding her family in a time of war, that would have been her first priority. Not books. Not objects.” Wow! That thought never crossed my mind.

This is a portion of one of the conversations about children’s books that happened between the authors, who are literacy professors in a teacher education program at a public university in northern New York near the border with Québec. Oftentimes, these conversations revolve around the importance of having an insider’s view, and the challenge of how to access insiders who can assist with the examination of books that claim to represent a culture. We believe that insiders’ perspectives are not gifts given at birth, defined by biology. A second-plus-generation immigrant can be born as a member of an ethnic cultural community, but is not able to speak the language, or exhibit familiarity with accepted cultural values. This may also happen when an individual has been adopted from a country outside the United States.

**Insiders’ Perspectives**

Mingshui Cai (2003) writes that an insider’s perspective is “a special sense of reality . . . not inherited through genes but acquired through direct and indirect experiences” (p. 172). While a direct cultural experience, (e.g., living within a cultural community), is not always an option for teachers and teacher candidates, they can develop an insider’s perspective through reading books written by authors who are recognized to have cultural insiders’ perspectives, or engaging in critical conversation with such people in the school or local community.
Yong brought this particular quotation from Mingshui Cai (2003) to Bob’s attention during another conversation.

Yong: I think this idea is very valuable.

Bob: I like the quote. And I like the name, now that you have written it down for me. With my L1 abilities of English, I would pronounce this as /ming shwee keye/. When I realize that is not a common American name, I am assuming, or my conjecture is, that individual is perhaps Chinese. But I don’t know because Cai is a name I never encountered. What is the last name if I want to refer to this person using just the last name?

Yong: His last name is Cai. [Yong then pronounces the consonant with a /ts-/ sound followed by a long “i” sound /eye/ (or, using the International Phonetic Alphabet: /ai/).]

Bob: Let me try to say that name. [Bob tries. He and Yong then both laugh.]

Yong: What’s really cool is this: His first name, Mingshui, means bright, clear water. He probably comes from southern China, a place where there is a lot of water.

Bob: This totally blows my mind! You can see somebody’s name and know what it means! In my world, his name might be Philip Schumacher. Philip means absolutely nothing other than Philip in my mind. But due to his family name, maybe he is (or one of his ancestors was) a shoe maker. Or if his name is Cooper, maybe his ancestors were barrel makers. But you were able to point out that it’s “really cool” that Mingshui has that name because he is writing things to enlighten people. Brightwater is a very good name to have!

Yong: The problem is, I only have access here to the way his name is represented using English letters (pin-yin), rather than Chinese characters. Mingshui could be several other words that have the same written representation in English, like homophones. So I don’t know for sure. I guess it is 明水. [Yong writes those characters on a scrap of paper on her desk. Bob looks on, astounded.] If so, I bet he is from the southern part of China, where there is a lot of water.

Developing Cultural Knowledge

Conversations about books can not only help develop cultural knowledge directly related to the content of a book, but also knowledge beyond it. The following conversation began with a book, but expanded to some fundamental values in Chinese culture.

Bob: Picture books help us gather our thoughts regarding cultural aspects. I remember the presentation you did for students in one of my classes about the concept of culture as an iceberg (attributed to Hall, 1976). I really think that metaphor may be too limited. I think
that “culture” is more like the ridge of a mountain where we can climb and then look around to see what is there.

Yong: That’s interesting. It reminds me of a saying in Chinese [Yong picks up a pencil and writes]:

山外有山。
“There are mountains beyond mountains.”

Yong: The saying continues with [she writes],
人外有人。
“There are people beyond people.”

Yong: And then [Yong writes],
天外有天。
“There is sky beyond sky.”

Bob: I notice that the character for mountain in the first phrase you wrote looks like a mountain. The character for sky looks a bit like the one for people, or person, or human. I’d suggest that we don’t use the word “man” because of the gender reference.

Yong: The three characters are connected. Watch. [Yong takes out a new piece of paper and starts with symbol for “person” (人) at the bottom. Then, above that, she writes the symbol again and adds a line to make the character “great” (大). Then, above that, she writes the symbol for great and adds another line to make the character “sky” (天). The completed characters look like this:]

天
大
人

Bob: Wow! I would start at the top and write the other characters below.

Yong: Oh no! I would never put a person above the sky!

Bob: But I thought Chinese writing goes from top to bottom, or left to right when you are reading a book.

Yong: That’s true. I never thought about it. Now that you asked, I think I might be influenced by Dao De Jing: “故道大，天大，地大，人亦大。域中有四大，而人居其一焉。人法地，地法天，天法道，道法自然。” (Laozi, 6th c. BCE/2011). I would translate this as: “Therefore, Dao is great; the Heaven is great; the Earth is great; and
Human is also great. In the universe there are four that are great. Human is one of them. Human comes from the Earth; Earth comes from Heaven; Heaven comes from Dao; and Dao comes from Nature.” Only by putting Human at the bottom can I show the order of the universe.

Bob: That is fascinating! You see, insiders do not always think about the reasons behind doing things like this. They just do it. It is when an insider unpacks that both the insider and outsider become aware. It is a two-way street when this insider-outsider conversation takes place. It’s a win-win situation. Now that I am aware of how this order of writing works, it has an impact on me. If I were trying to write this in Chinese now that you have explained this to me, I’d feel uncomfortable if I put “great” below “a person” and “sky” below those two.

Yong: You are right. I never thought about it!

Bob: You know, as you were writing the character for mountain (山), I started to think that it’s not the ridge that represents “culture”—it is the entire mountain.

Yong: Yes, there are peaks, summits, ridge lines, vistas, trails, valleys, flora and fauna, rivers, lakes, creeks, animals, people. These are all part of the mountain, part of culture.

Bob: And as you get closer to the mountain, when you are on a path, walking up a hillside, you see the trees and plants up close. You can distinguish different wildflowers. These are aspects of the mountain that you can’t distinguish from afar. Just like culture. As you have an opportunity to travel to a different part of the world, or converse with someone from a different culture, you can distinguish features that you would miss otherwise.

Yong: Exactly!

Conversations about Picture Books

Similar to the aforementioned conversations, the following two excerpts from conversations about books can show how such conversations can help interlocutors develop and promote their understanding of each other’s culture.

Legend of The Milky Way. Yong and Bob are having lunch together. The conversation drifts to the topic that growing up in one specific culture probably provides us with a single-dimensional culture perspective, which we might assume is the view of everyone else as well.

Yong: That reminds me of a book. Just a second. [She leaves and comes back with Legend of The Milky Way by Jeanne Lee (1982).] Have you read this book?

Bob: I don’t think so. So it is about the legend of The Milky Way in China?
Yong: Yeah.

Bob: How is it different?

Yong: Well, first of all, can you tell me why this galaxy is called The Milky Way in the U.S?

Bob: I’m not sure. In French it is called “La Voie lactée,” which translates into the same thing that it’s called in English. I just assumed that it was called that all over the world. I figured it got its name because there are so many stars in one place that it looks like a path of milk. My clearest view of this was when I was camping in the mountains—the Colorado Rockies—during a clear night. Someone told me that you can imagine that our galaxy is a giant Frisbee. When you look at it sideways, through the bulk of the disk, you get a sense of how many stars are up there. That perspective really put me in my place. What a big Frisbee we are riding on.

Yong: Are you familiar with any myths about this?

Bob: I think it might come from a Greek myth. [Bob looks for information online and then shares it with Yong.] Do you know about Heracles? He is Zeus’ half-mortal son. Zeus brought Heracles home for Hera to breastfeed while she was sleeping. When Hera awoke, she quickly pushed Heracles away, which caused a few drops of milk to spill into the night sky. That is how the Milky Way got its name.

Yong: Good story! In Chinese, it is not called The Milky Way.

Bob: What? Are you kidding me?

Yong: No! It is called the Silver River. [Yong does not need to access any material online. She obviously knows the story she is about to tell.] According to Chinese folklore, a long time ago, there was an orphan who lived with his older brother and sister-in-law. Both treated him unkindly. His only friend was an old buffalo, who was Jin-Niu-Xing, God of Taurus, banished to the human world by the King of Heavens. The boy, therefore, was called Niu-Lang, the buffalo boy. With the help of the buffalo, Niu-Lang found the place where the princesses of the Heavens bathed on the earth. There he met Zhi-Nv, the Weaver Princess, who was the seventh daughter of the King of the Heavens. The two fell in love and married each other. Soon they had a daughter and a son. This violated the law of the Heavens. Zhi-Nv was brought back to the Heavens. Niu-Lang went after his wife, wearing a cloak made of the buffalo’s skin and carrying the two children. Just as he was about to catch up with his wife, The Queen of the Heavens pulled a silver pin from her hair and drew a silver river across the heavens to separate the lovers. Their love moved the magpies in the heavens, which all came and formed a Que-Qiao, a bridge of magpie, over the river to help Niu-Lang and Zhi-Nv get together. The King and Queen of the Heavens were also moved. They finally agreed that Niu-Lang and Zhi-Nv could meet once a year on the bridge on the seventh day of the seventh month. That’s how the Silver River got its name.
Bob: Wow! How fascinating! Now I have three-dimensional views: the scientific view of galaxy with billions of different stars, the Greek mythological view of Milky Way, and the traditional Chinese view of Silver River!

Yong: There you go! By the way, several adaptations were made in Lee’s *Legend of the Milky Way*. It changed how Niu-Lang and Zhi-Nv met each other, omitted that they had two children, and replaced the magpies with blackbirds. I guess Que-Qiao would be called Hei-Niao-Qiao, Blackbird Bridge, instead!

Bob: Oh! Do you think these changes make the book inauthentic?

Yong: I do! In China, the sight of magpies is associated with a good omen, while blackbird is just the opposite. The word “Magpie Bridge” has been used figuratively to refer to anything that promotes love relationship. It has also been used for companies providing dating and/or wedding services, as well as qupai, the name of the tunes to which qu, a type of verse popular in Yuan Dynasty (1271-1368), is composed.

**Lin Yi’s Lantern: A Moon Festival Tale.** Yong and Bob are talking about accuracy and authenticity of multicultural children’s books.

Yong: I used to think that multicultural children’s books about food and festivals (you know, things that are visible parts of a culture) would not have serious problems regarding accuracy and authenticity. It wasn’t until a year ago when I did a research project on children’s books representing Chinese culture that I realized that this is not true.

Bob: What did you notice?

Yong: Sort of like what you mentioned about *Basho and the Fox*—illustrations that inaccurately and inconsistently depict the characters and settings. For example, look at this book about the Moon Festival [Yong pulls the book *Lin Yi’s Lantern: A Moon Festival Tale* (Williams & Lacombe, 2009) from the shelf and passes it to Bob.]

Bob: [Starts to turn the pages.] The illustrations are beautiful!

Yong: [Smiles.] The review from *School Library Journal* posted at Amazon thought so too! But the illustrations are very, very confusing. On one page there was this boy in contemporary Chinese clothes and riding a bicycle, a transportation vehicle that did not become available to common Chinese people until after 1949. On the next page you will see other characters wearing clothes belonging to different historical periods in ancient China. Some women were wearing kimonos and holding umbrellas, as if they were in Japan!

Bob: So where and when was the story set?
Yong: I really can’t tell! I think the author meant to set it in modern times because the note in the book mentioned that “it is estimated that over 300 million Chinese people ride a bicycle” (Williams & Lacombe, 2009, back matter). But that would be inconsistent with the way characters were depicted in the books.

Bob: Is information in the text or notes accurate?

Yong: Unfortunately, no. Look here. [She turns to page 5 and reads.] “‘How much is two pounds of whole grain rice please?’ Lin Yi asked the rice trader.” Apparently the author did not know that pound was never used as a unit of measurement in China. And whole grain rice? Also, listen to this. [She turns to the back matter and reads aloud.] “Markets in small, rural towns in China are usually found in the town center along a wide, main street.” Town center and main street are very foreign concepts to Chinese living in rural areas. I may be overgeneralizing about this, but I’ve lived in rural areas and have taught in small towns. A market is never going to be on a main street! I can show you what a market in a small, rural town looks like. [She turns to her computer and types “Chinese rural market.” She clicks on one of the images.] Here!

Bob: Look at that market! People are sitting on a curb with vegetables spread out on plastic tarps on the ground in front of them.

Yong: But not on a wide, main street! A market like this is usually located in a street where motor vehicles are not allowed to enter.

Bob: You would think authors do their research before they write about a particular culture.

Yong: They probably did, but maybe they couldn’t find the right sources. Any Chinese would be able to point out the inaccuracies in both the text and illustrations. I think this is an ethical issue for writers—if they are writing about a culture they are not familiar with, then it is important to spend quality time learning about the culture, like Mingshui Cai (2003) said, through direct and/or indirect experiences. A book like this reinforces the stereotypes that Chinese are people wearing exotic clothes, eating exotic food, and celebrating exotic festivals!

Bob: Suppose I was a third-grade teacher, a white American male, and I got this book, or any multicultural children’s book. How can I know if it represents the culture accurately and authentically?

Yong: Great question! The best way is to consult sources, multiple ones if possible, such as online book reviews, librarians, and people with insiders’ views of the culture in the school as well as local community. I developed an evaluation checklist for selecting multicultural children’s books in a previous article (Yu, 2017). It can provide a tool to examine multicultural children’s books, or to know what question to ask when consulting a person who has an insider’s perspectives.
Bob: I’ll have to look at that checklist. Hey. I wonder if we can develop a presentation for the American Reading Forum conference that will take place in December, 2016.

Yong: Yes, let’s do that!

Well, that’s what we did. We decided to call it, “Conversations with and About Picture Books: Developing Insiders’ Perspectives.” One of the slides at that presentation looked like what you see below:

**Recommendations for Developing Insiders’ Perspectives**

- Examine the classroom library to ensure that it includes books that are both mirrors (representing children in the class), windows (representing children from different cultural backgrounds), and sliding glass doors (giving us access to cultures we can walk into through our imagination) (Bishop, 1990/2015).
- When selecting books, use rating scales to measure literary quality as well as cultural authenticity (Yu, 2017).
- Consult local ethnic communities and multicultural resources for suggestions on what to include in a multicultural collection (Mei-Yu Lu, 1998).
- Read extensively in the literature (fiction and non-fiction) written by “insiders,” those writing about their own culture and experiences (Bishop, 2003).
- Facilitate activities with books from multiple cultures in order to develop readers’ abilities to critically examine texts for accuracy and authenticity.
- Develop empathy with insiders from different cultures.
- Embrace different worldviews and expand viewpoints in order to facilitate the attitude that “All people don’t see the world the way I do.”
- Acknowledge differences within countries and cultures (e.g., diversity of language and lifestyles within Asian cultures).
The task of finding people with insider views of a particular culture and initiating conversations with them about multicultural children’s books may seem daunting to teachers and teacher candidates. We do not expect teachers in any part of the U.S. to be able to have a bookshelf in which there is one book for each culture, or to find people representing each culture to consult with. What we suggest is to start with the resources available in the community: students, colleagues, parents/guardians, and community members. We (Yong and Bob) work at a college located in a small town that is not diverse. Approximately 90 percent of the population is white (U.S. Census, 2010). Many of the students enrolled in our teacher education programs cannot recall reading one multicultural children’s book in their youth. However, one of our partner schools has children who speak eight different languages at home other than English. In the past few years, professors and teacher candidates in our programs have interacted with children, colleagues, peers, and community members with diverse cultural backgrounds. The resources are there. It is up to us to reach out and include these resources in teaching and learning. As Edward Hall (1976) states, “Ethnic diversity can be a source of great strength and an invaluable asset, provided people can develop the desire to learn from each other (one of the principal ways of learning about oneself)” (p. 71).
References


Children’s Books


Knowledge of Information Literacy and Text Structure (KILTS): An Instrument Developed to Measure Emergent Bilingual Hispanic Third-Graders’ Gains from a Mentoring Authors Experience

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The new literacies of the Internet and other ICTs include the skills, strategies, and dispositions necessary to successfully use and adapt to the rapidly changing information and communication technologies and contexts that continuously emerge in our world and influence all areas of our personal and professional lives. (Kinzer, Coiro, & Cammack, 2004)

In a world that is more connected via the new literacies, including the Internet and information communication technologies (ICT’s) than ever before, students need to be taught how to navigate successfully and safely to find the information they need, not only to succeed in school, but also to succeed in life (Moje, Giroux & Muehling, 2017). This set of skills, according to The American Library Association (1989) is called information literacy and is defined as a set of abilities requiring individuals to "recognize when information is needed and have the ability to locate, evaluate, and use effectively the needed information.” Teaching the use of new literacies is a challenge for teachers of students in K-12 schools and is especially challenging when students are second language learners. According to Hobbs (2005), the active learner-centered model of instruction of new literacies is highly effective for second language learners. However, to complicate the issue further, these literacy challenges are embedded in the Common Core State Standards (CCSS, 2010) or one of the slight variations on CCSS, adopted by more than 37 states, which teachers must prepare students to meet. The teacher’s role has become more critical in orchestrating learning experiences for students (Coiro, 2009) so that they achieve the proficiency currently required, which is well above the traditional foundational literacy (reading and writing) level that was taught and incorporate the requirements needed to navigate the quickly changing literacy world (Leu, Kinzer, Coiro, Castek, & Henry, 2013).

Theoretical Framework of the Study’s Purpose and Procedures

In this study, using a sociocultural theoretical (Vygotsky, 1978) and a sociocognitive theoretical (Bandura, 1986, 1997) perspective, three teachers of emergent Hispanic, bilingual
third-graders in a charter school where 98% of the students are English learners, in the southern part of the United States, created a Mentoring Authors experience with the purpose of increasing their students’ knowledge of Information Literacy and text structure. This experience included students working in groups to write information books. From the sociocultural perspective, the students learned about Information Literacy and text structure from their teachers, more knowledgeable others. To achieve this goal at the elementary level, students first learned about the text features of expository text such as the table of contents, the glossary, and the index. Then, they began to learn about the types of text structure that most informational or expository text use, including description, sequence, compare and contrast, cause and effect, and problem and solution. The teachers selected animals as the thematic unit topic and allowed the students to select an animal of their choice to study. They eventually shared their knowledge and presented their books to the class and to their parents.

From the sociocognitive theoretical perspective, students followed their teachers’ modeling of the ways to find information in books and on the Internet and gained self-efficacy about their ability to use Information Literacy and text structure to create their own informational books. The teachers modeled a strategy of identifying the text structures using think-aloud color codes (Blachowicz, Fisher, Ogle, & Watts Taffe, 2013 p. 28-31). Building on that strategy, students used color coding to mark copies of information they found on their topic on the Internet. The teachers would scaffold the students’ learning as they underlined text with color markers to identify the text structures. Then they were given the chance to try to identify the types of information themselves using color markers for the different types of text.
Design of the Study

A quasi-experimental design with an experimental group of 93 emergent Hispanic, bilingual third-graders at a charter school in the Southeast were included in the Mentoring Authors experience during their classroom reading instructional block.

A small comparison group of 14 emergent Hispanic, bilingual third-graders, who were being tutored after school for two hours a week in addition to the regular classroom instructional block, were also participants in the study. The students were categorized as level 1-5 English language learners using the 2015 Comprehensive English Language Learning Assessment (CELLA), developed by the Educational Testing Service (ETS) in 2005. The assessment was tested for reliability and validity as well as content validity and found to be acceptable (CELLA ETS, 2005). The instrument is designed to measure students’ English language proficiency. For instance, level 1 students demonstrate very little understanding of English, level 2 students demonstrate limited understanding, level 3 demonstrate more understanding, level 4 demonstrate extensive understanding and level 5 students understand nearly everything, are proficient in reading, writing, speaking, and listening in English and are almost ready to exit special classes for English Speakers of other languages (ESOL). Only levels 3-5 were included in the analysis.

Methods

The researchers trained the three teachers, each with six or fewer years of teaching experience. Each of the teachers taught a class of about 30 students in 90 minute reading blocks from October through November using the Mentoring Authors Experience. The 14 comparison students were taught during their school day by certified teachers. All teachers were teaching the students to meet the state standards. Additionally, the 14 comparison students were participating
in an after school one-on-one reading tutoring program in which they were tutored one hour twice a week by an Elementary Education program preservice teacher.

The treatment was the Mentoring Authors Strategy which included the following steps: 
(a) Learn about text structures using Think–aloud color codes (Blachowicz, Fisher, Ogle & Watts Taffe, 2013) modified to add more structures (See figure 1.), (b) Research using information books, (c) Write information books, and (d) Publish information books. Following the Mentoring Authors experience, the teachers and students invited parents and families to a celebration in which they shared their original books created while they were learning about Information Literacy and science. This culminated a unit of study incorporated curriculum goals and standards, and best of all, the imaginations of students eager to learn. The Mentoring Authors Strategy motivated students to have an authentic purpose for developing their skills to comprehend informational text.

*Figure 1. Modified Think-aloud Color Codes*
Assessment and Instrument Development

Just as with all good instructional approaches, there was a need to measure the students’ academic growth. There already exists an instrument created by Kent State University librarians called TRAILS: Tools for Real-time Assessment of Information Literacy (2006) that is free and available online for third, sixth, ninth, and twelfth graders. It is aligned with the CCSS and has been widely used. However, when this instrument was examined by the researchers, it seemed that the text was written in a way that was much too complex for emergent Hispanic, bilingual third-graders to comprehend. To keep the concepts, but simplify the complexity of the language an instrument, Knowledge of Information Literacy and Text Structure (KILTS) (Author, 2016) was created. The KILTS items were evaluated by 2 librarians for content validity. They found that the items were similar to the types of information that is needed for the standardized testing that the students would take on the state standardized assessment, a test aligned with the competencies on state’s version of the CCSS. The format has item stems that follow the same pattern of asking a question about where one would look to find different types of information. (See figure 2 for the instrument and answer key.) The teachers read aloud the items to the students in both the pretest and the posttest.

Figure 2. Knowledge of Information Literacy and Text Structure (KILTS)

Name _____________ Student’s Name ___________ Age _______ Grade ______ Date______

Knowledge of Information Literacy and Text Structure (KILTS)

1. If I want to find facts about seals, I would look for
   a. A description and a picture in an encyclopedia.
   b. A story about Sammy the Seal.
   c. A drawing of circus animals.

LAFS 1.W.38

2. If I want to find facts about trees, I would
1. Look at a show on TV about trees and forests.
2. Watch a video on YouTube about tall plants.
3. Go to www.realtrees4kids.org to find facts.

3. If I want to compare the weather in New York with the weather in Florida, I would
   a. Read a newspaper to find out what the temperature is today in Florida.
   b. Find out how many people are at the beach in New York and in Florida on a hot day.
   c. Find out how much rain there is in a year in both places on a map.

4. If I want to learn how to make a cake, I would
   a. Read an article about the amount of sugar and flour in birthday cakes.
   b. Read a book on how to make a cake and follow the steps.
   c. Watch a video of people eating cake at a birthday party on Google.

LAFS W 2.5 : LAFS W 3.7

5. If I want to find information about lions, I would
   a. Look in the table of contents of a book on wild animals.
   b. Page through a nature magazine for pictures of lions.
   c. Read a story called Andy and the Lion.

6. If I want to find out about the kind of flowers that bloom in spring, I would
   a. Go to Home Depot and buy spring seeds to plant.
   b. Read an article in “Better Homes and Gardens” on plants that bloom in spring.
   c. Buy a calendar with pictures of flowers.

7. If I did not know the meaning of a word in my science book, I would
   a. Ask my friend what it means.
   b. Ask the teacher to read the word and tell me the meaning.
   c. Look in the glossary in the back of the book.

8. If I want to learn facts about stars in the sky, I would
   a. Observe them at night and find the North Star and Milky Way.
   b. Read details about the patterns of stars in the sky on the internet.
   c. Read a magazine at the grocery store about stars in the movies.

9. If I want to compare how well two basketball teams played each quarter,
   a. I would find out the score for each team at the end of the game.
   b. I would read a newspaper to find the score for each after each quarter.
   c. I would read an article to find out about members of the team.

10. If I want to get a definition of type of dinosaur,
a. I might get it by reading the words after the name of the dinosaur in an information book.
b. I might get it by checking a glossary in the back of the book.
c. Both of the above.

11. If I want to find out about kinds of birds, I would
a. Read a book on building a bird house.
b. Read an encyclopedia article on types of birds.
c. Find a picture of different birds on the Internet.

12. If I want to learn more about how people live in different places, I would
a. Look in a book about people around the world under the headings of food, dress, and work.
b. Read today’s newspaper to see what happened in different countries.
c. I would look at the pictures on the internet of people around the world.

13. If I want to find out what a part of an information book is about, I could
a. Read the summary at the end of the book.
b. Read the questions and answers at the end of the book.
c. Look at the Table of Contents and read the topics and subheadings.

14. If I want to write a comparison of two animals, I would need to
a. Read about the animals’ size, color, habitat, and eating habits.
b. Read a story about where the animals live.
c. See a video about the animals in the wild.

15. If I want to create an information book about foods from around the world, I would
a. Get books from the library about food and how to prepare the different types.
b. Read articles on the internet about food from different countries, plan an introduction, select countries, and select vocabulary for the glossary.
c. Get books about foods from different countries, select characters to include in different settings, and write about how they prepare their food.

16. If I want to know how the 13 American colonies became states, I would
a. Read books on American History and the Revolution in the library.
b. Study the Declaration of Independence at the museum.

17. To write a book about different kinds of dogs, I would
a. Find facts on dogs on the internet and in books, and organize the facts, definitions, and details before writing.
b. Find facts about a dog on the internet and start writing.
c. Start writing about the kinds of dogs I like.

18. When I read about animals that I want to write about, I
   a. Draw pictures of each animal and color them before I write.
   b. Take notes about the animals and the books where I found the information.
   c. Copy the information carefully, word for word, as it is written in the book.

LAFS 3 W.8

19. When I want to write my opinion that everyone should read every day,
   a. I give a good reason to support my opinion.
   b. I state my opinion why it is the best activity and describe what I read every night before bed.
   c. I state my opinion, give several reasons to support my opinion, and write a conclusion.

20. If I want to compare and contrast living in the city with living in the country, I need to
   a. Interview someone who lives in the city and someone who lives in the country.
   b. Find out important points and key details about life in both the city and the country.
   c. Read stories about living in the city and living in the country.

LAFS 3.3R.I 3.9

KILTS Answer Sheet.

The chart is set up with the following number of questions on each page so that you could fold the paper to check the letter answer for each question.

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Results from the Assessment

Pre-test and Posttest data were collected in order to determine if the KILTS treatment had a significant effect on students’ knowledge of informational literacy and text structure. The following analyses were conducted: Paired sample T-test to compare difference within each group, an ANOVA was used to compare differences between groups, and ANCOVA was used to control for differences in the pre-test, and Brown Forsythe and Welch tests were conducted to account for unequal sample sizes.

Table 1.

<table>
<thead>
<tr>
<th>Group</th>
<th>Number</th>
<th>Mean Pre-test (standard deviation)</th>
<th>Mean Post-test (standard deviation)</th>
<th>Difference (standard deviation)</th>
<th>P-value</th>
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<tr>
<td>Kilts (within)</td>
<td>N= 93</td>
<td>12.31 (3.24)</td>
<td>16.51 (2.06)</td>
<td>4.2 (2.84)</td>
<td>.000&lt;.05</td>
</tr>
<tr>
<td>Comparison (within)</td>
<td>N= 14</td>
<td>10.78 (3.30)</td>
<td>12.42 (3.20)</td>
<td>1.64 (3.02)</td>
<td>.063&gt;.05</td>
</tr>
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The students in the experimental group made significant gains with a difference of 4.2 in their mean scores with a p < .05 while the comparison group had a difference of 1.64 in their mean scores with a p > .05.

Discussion

Besides the values of the differences on the KILTS assessment for the experimental group taught with the Mentoring Authors experience, it is noteworthy to mention that all the students (N=93) plus the students who were ESOL levels 1 and 2 who were not included in the analysis, but who were included in the treatment in the classrooms, passed the state assessment in the area of informational text. There is no report available on the rate of passing on the state assessment for the comparison group. The unavailability of those scores is a limitation of the study for any comparison in this area.
One implication of the study is that it shows teachers can teach information literacy and text structure to emergent bilingual Hispanic third-graders using the Mentoring Authors Experience. As Hobbs (2005) suggests, if this student-centered approach is beneficial for second language learners, it is most likely beneficial for all elementary students.
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literacies emerging from the Internet and other information and communication


Literacy through Community Partnerships: Developing Risk-Taking Teacher Leaders

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Abstract

This qualitative study (Seidman, 2012) investigates the traits or dispositions of teacher leadership in secondary English/Language Arts (ELA) teachers enrolled in a graduate course emphasizing teacher advocacy/agency, professional growth, community literacy, and digital literacy. Teacher preparation programs interested in preparing teacher leaders who enact community literacy projects must begin emphasizing in their curriculum the kinds of literacy practices that facilitate ongoing communication with administrators and constituents. The role of the building principal is key in supporting teachers who might fear failure or pushback from the community or students. Teachers need support in developing these skills necessary to advocate for structured time to co-create literacy projects that can enhance and sustain local communities through economic, cultural, or environmental investigations. Moreover, teacher preparation programs must continue to encourage and nurture teachers to be curious explorers who investigate issues or concerns in their community, and acknowledge that failure can elicit deeper meaning for teachers and their students.
Linda Flower (2008) defines community literacy as a rhetorical practice for inquiry and social change. She (2008) notes its educational context in Dewey’s conceptualization of progressive education where, “people learn things by a hands-on experiential and strenuously intellectual engagement with the world” (p. 16). In 1999, I discovered just how challenging it is to engage students in a hands-on experience in a community literacy project as a secondary English Language Arts (ELA) teacher. My first attempt with students was born out of a question from the city administrator in the rural community where I taught for 21 years. He asked me if there was any way to preserve the stories of the many octogenarians and nonagenarians in our nursing homes. His mother had just passed away and he lamented that he hadn’t gotten her stories. What I learned during the process is that my students were speaking for others, or, as Flower (2008) acknowledges, “Taking rhetorical action concerned with others begins by learning to listen to and speak with them, especially with those ‘Others’ whose voices are often silenced or marginalized” (p. 82). Ageism does silence some of the most valuable citizens in our society and it was our goal to be the voice of these wise residents.

I had begun my teaching career seven years earlier and had a professional awakening at a National Writing Project rural summer invitational institute. I witnessed other teachers’ demonstrations of community literacy projects and I wanted my students to have the same meaningful experiences. At the time, I didn’t realize that doing so involved a great deal of risk, but I jumped in blindly. The first obstacle I faced was budgetary. Long interested in technology, I wanted the oral histories in digital format. After I laments to our guidance counselor that I couldn’t get the digital tools I needed because of our budget, she encouraged me to apply for a non-profit foundation’s teacher of excellence award as a possible means to fund the work I wanted to do. The award allowed me to purchase a new computer with Microsoft Windows,
quality Sony handheld tape recorders, audio tapes, and funds for the services of a professional historian and a storyteller, who both instructed my students (and me) about what we must do and how we might do it well. Even then, it was risky to ask for other necessities (e.g., buses to transport students; assistance from our technology coordinator; arranging student visits with nursing home personnel; letters of communication to parents and all participants; constructing consent forms for students and nursing home residents; and arranging computer lab time and searching for online sites to house the stories). There were many days I asked myself, “What have I gotten myself into?”

In hindsight, I’ve come to realize that what my students and I did was nothing short of miraculous. Interviewing nursing home residents and transcribing interviews is challenging literacy work. I still have paper copies of those oral histories, snippets really, of the lives of the elderly in our community. The webpage developing sites we used, Geocities and AngelFire, have no archive of the digital stories, but luckily, our local history museum requested paper copies, so the stories are preserved. The project, “Elderly Voices: Living Links to the Past” taught me a great deal about teacher leadership and the necessity of risk and perseverance if I wanted to provide authentic literacy experiences for my students and my rural community. That first project gave my students a deep sense of accomplishment, but we also celebrated most what we learned: love, compassion, patience, history, dignity, and a sense of our own mortality. The subsequent years of my secondary career continued with many forms of community literacy including: family, local business and prominent women oral histories; multi-generational work ethnographies; and finally, a study of local poverty and hunger.

Community partnerships were essential to me as a place-conscious, ELA educator who hoped to instill within my students five senses of place consciousness as defined by Haas and
Nachtigal (1998) including living well in community or a sense of belonging; living well spiritually or a sense of connection; living well economically or a sense of worth; living well politically or a sense of civic involvement; and living well ecologically or a sense of place. I wanted to move beyond the four walls of my classroom because, to me, they were not conducive to attaining a sense of belonging, connection, worth, place, or civic involvement. I wanted to provide my students with a sense of rhetorical agency. Flower (2008) cites the work of Brooke (2015), identifying four interrelated forms of rhetorical agency:

- speaking up, or giving voice to a personal or group position that would otherwise go unheard;
- speaking against, or engaging in critique of positions, proposals, and arguments advanced by others;
- speaking with, or working to articulate ally relationships with groups, positions, and persons different from one’s own;
- and speaking for, or stating commitments for projects, positions, principles, or visions for the future. (p. 40)

Sobel (2004) cites the Rural Challenge Research and Evaluation Program of 1999 concerning the importance of the student grounded and rooted in place:

A grounded, rooted learner understands that his/her activities matter, that they affect the community beyond the school. It is out of this particular formulation that the ‘student as resource to the community’ takes shape— that understanding that students need to be thought of as productive assets to the health of the community. (p. 12) [Emphasis Sobel]

Robert Brooke (2003) writes that place conscious education “asks us to think of the intradependence of individual, classroom, community, region, history, ecology—of the rich way local place creates and necessitates the meaning of individual and civic life” (p. 10). The intradependence of these six entities first requires awareness of each student and elicits several questions: Who is the individual in my classroom? How does that student impact her classroom?
How does our collective classroom impact our community? Does our community impact our region? What is our history? How do our history and our present impact our community ecologically?

Brooke (2003) writes that “students need to understand who their community is and why it is that way…they need to be able to act effectively in and with the community—identifying current strengths and problems, negotiating satisfactorily with community members who hold different opinions” (p. 12). Nancy Welch (2008) argues that community literacy is “engaged community rhetoric…open to ordinary people. Ordinary people make rhetorical space through concerted often protracted struggle for visibility, voice, and impact against powerful interests that seek to deny visibility, voice and impact” (p. 477).

It may come as no surprise that my conviction and commitment to engage in community literacy was born out of my concern for mandated assessment of learning standards, (i.e. No Child Left Behind (NCLB)). As an 11th grade teacher at the time, I helped write the ELA standards and assessments because I lived in a Midwestern state with predominantly rural schools that believed teachers were the experts who should do so. However, I was also given the task of conducting the baseline assessments for all reading and writing standards. The teacher in me almost died. Later, that same state opted to hire an outside national testing company to complete the assessments. All of our hard work was for naught. What I observed about student writing in the state-wide writing tests was that it was canned, functional, or contrived. The writing lacked power or voice; it became a chore a student must complete. I wanted learning to have meaning. I wanted learning to have significance. With the advent of the Common Core State Standards (CCSS) initiative, the demand for complex student writing increased the stakes,
but I believe a place-conscious pedagogy provides the experiences and practice that students needed to meet the standards. According to Brooke (2015),

The [CCSS] expects teachers to use a common set of teaching strategies and methods to understand the process of writing certain types of texts: argument, information, and narrative. Place-based writing can be aligned to the Common Core standards in writing because the investigation of local place through inquiry may elicit texts that may argue, inform, or tell a story. (p. 245)

Teacher Leadership Seminar

Because of my experience with mandated assessments, and my observations as a teacher of English and language arts enacting community literacy projects, my essential questions for instructing inservice teachers became, “How do I create agents for change who advocate for their students?”, “How do I encourage professional growth through research and inquiry?”, “How do I frame community literacy in meaningful ways to elicit the practices and methods necessary to engage in such endeavors?”, and because of the rapid changes in digital literacy, “How do we teach to the digital natives in our current classrooms?” With these questions in mind, I developed a course focused on teacher leadership that included four threads: teacher advocacy/agency, community literacy, professional growth, and digital literacy. This course and a follow up course based on teacher reflective practice was funded by U.S. Department of Education's Title II Supporting Effective Educator Development (SEED) through the National Writing Project. Twelve graduate students, practicing English Language Arts (ELA) teachers from the surrounding area, nine of whom taught in small rural schools within ninety minutes of campus, completed the course. This seminar course included presentations by local university and school district personnel with expertise in teacher advocacy and agency, community literacy,
and professional growth. We also conducted a virtual meeting with a U.S. Department of Education educational technology consultant. Students were also made aware of local resources they might use as part of their curriculum through field trips to our university library archives, the city art museum and nature conservation center.

During our first class, small groups were formed and each determined its own meeting dates, times and locations. They could utilize a combination of online and face-to-face meetings and had to document the time spent participating in online chats and face-to-face meetings. Meetings could be used to share and discuss selected readings, personal writing, teaching demonstrations, technology-integrated writing lessons, school-community partnerships, plans for a teacher advocacy program, classroom inquiry projects, etc. Students then outlined their individual plan of action in a Letter of Commitment. Their plan had to include three personal and/or professional goals, as well as their projected steps to achieve those goals. The goals were focused toward improvement of themselves as a writer, teacher of writing and professional educator. Each was instructed to develop a specific inquiry project in his/her classroom which could include new or revised writing units for their classroom; an After-school Writing Circle or other writing club; a writing exchange program between two or more schools; or community/school writing partnerships. Students were also required to read, discuss and comment with their group upon the inquiry texts they chose. Each was required to read three book length resources or equivalent. Most groups chose to read two books in common and one individual book (or manuscript) related to their specific inquiry. The record of their discussion notes, personal and professional writing, their inquiry project and reflective writing was collected in a culminating portfolio. Students reconvened at mid-term to write a reflection. In addition, I
met with each of the groups throughout the semester at various locales to assess the collective learning, status of the inquiry projects, or any concerns of the groups.

**Participants**

Utilizing Seidman’s (2012) qualitative method, I selected three teachers of the twelve in the course, and conducted three ninety minute interviews with each. I asked the teachers three guiding questions, “What is your history as a teacher?”, “What is your understanding of teacher leadership?”, and “In reflection upon this course, what have you learned about teacher leadership?” Camille was in her second year of teaching in a school district approximately thirty minutes from our campus. She was as an enthusiastic teacher in our Master of Science in English education program who had had a difficult first year of teaching and left that school. Her experience in her new school was quite different. In her new school, she quickly became a leader whom others sought out for ideas and advice. She also established a rapport with the middle school principal who supported her efforts to enact her literacy project. Katrina was in her fourth year of teaching in a high school district fifty minutes from our campus. In her third year of teaching she had been approached by her principal to become the school’s English department head, due to a retirement. Katrina graduated from this community’s religiously affiliated four-year university and then decided to stay when she was offered a high school teaching job. Katrina was also seeking her Master of Science in English education degree. Katrina felt very much a part of her new community even beyond the school environment. Like Camille, she had a rapport with the principal who supported her efforts to enact a community literacy project. Camille and Katrina were also together in their self-selected inquiry group with another teacher, a fourteen-year veteran whom they both noted served as a mentor to them throughout the course.
Camille and Katrina read in common, *Write Like This: Teaching Real-World Writing Through Modeling and Mentor Texts* by Kelly Gallagher (2011), during which Katrina noted that she learned it was “important for students to see the messy beginnings of written works, especially if the teacher vocalized thinking behind the process.” Camille also read *Everyday Editing: Inviting Students to Develop Skill and Craft in Writer’s Workshop* by Jeff Andersen (2007). She noted, “When I first read that Andersen was a proponent of inviting students to take place in instruction, I didn’t understand. I am inviting students to take place in their own learning?! I’m inviting them to ask, ‘What do you notice?’” Camille also read *Discovering Media Literacy: Teaching Digital Media and Popular Culture in Elementary Schools* by Renee Hobbs and David Cooper Moore (2013). Katrina read *Reading in a Participatory Culture: Remixing Moby Dick in the English Classroom* by Henry Jenkins, et al. (2013), and *Writing our Communities: Local Learning and Public Culture* by David Winter and Sarah Robbins (2005), the latter becoming central to her understanding of community literacy. Camille’s community literacy project included taking her students outside the classroom to write in an outdoor space, that is, a local stream, where they produced poetry they later performed in a public poetry slam in a community venue rather than the school building. Katrina’s community literacy project was a student-run community online literary magazine where students served in roles as editors, public relations managers, marketing and advertising specialists and web designers. Students also contacted and worked with community members including marketing consultants and local businesses who provided funds for the website. Katrina’s action research in this course became her master thesis.

Sandy was born and raised in the community where she taught approximately forty minutes from campus. She had taught in the community for over thirty years and was a non-
degree seeking student, but a teacher who continued to select courses that she felt would improve her practice. She partnered with another middle school ELA teacher, Dorothy, a non-traditional student who came to teaching later in life, but who was completing her Master of Science in English education degree and who had established an after-school writing club as her literacy project, something Sandy hoped to initiate in her own school district. Sandy and Dorothy read four books in common: *Bird by Bird: Some Instructions on Writing and Life* by Anne Lamott (2007), and three texts by Georgia Heard: *Finding the Heart of Non-Fiction: Teaching 7 Essential Craft Tools with Mentor Texts* (2013); *Writing Toward Home: Tales and Lessons to Find Your Way* (1995); and *Awakening the Heart: Exploring Poetry in Elementary and Middle School* (1999). Sandy was clearly a leader in her community, a small town where teachers had a great deal of status. Over the years, she had selected a specific student each year as her special literacy project, that is, a student she observed who had great potential in literacy, but who had dire personal circumstances. Sandy committed herself to these students each year and had long-standing relationships with her “special” students into adulthood. However, Sandy was unable to enact her literacy project, because she didn’t have the support of her new administrator. Her school also followed a scripted curriculum and Sandy felt her hands were tied in any effort at a classroom community literacy project.

**Data Sources and Research Questions**

The data sources were the transcripts of the teacher interviews and the content of the course, including letters of commitment, cumulative portfolios, group members’ responses to each other’s research and community literacy units or enactments. My research questions included:

How do teachers identify as leaders?
How do teachers enact community literacy?

What risks are involved in enacting community literacy?

Data Analysis

Three researchers independently open-coded the transcripts of the interviews and then met to review the codes before axial coding. The following axial codes emerged from open coding: teacher as advocate for students, teacher as learner, creativity/innovation, peer/mentor relationships, and community literacy. We met to concur about the definitions of each code, but particularly struggled with our consensus of the definition of creativity and innovation, because, for me, as a veteran teacher, many of the creative or innovative ideas were not new (See Figure 1). Henriksen and Misha (2015) argue it is difficult to define creativity, “Studying creativity…is complicated by its abstract and complex nature, and the fact that there is not one consistent definition of ‘what creativity is’ or what it means for effective teaching” (p. 2). They also acknowledge that because of standard-based assessments, it is challenging to study creativity in the classroom.
<table>
<thead>
<tr>
<th>Code</th>
<th>Definition</th>
<th>Example</th>
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<tbody>
<tr>
<td>Teacher as Advocate for Students</td>
<td>The teachers show concern for students inside and outside the classroom and advocate for a student-centered classroom.</td>
<td>“Here are your lower level kids and they did this. Quit underestimating us. Use us. We become a resource. Let's work together.”</td>
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<tr>
<td>Teacher as Learner</td>
<td>The teachers who engaged in learning and co-creation of new knowledge in the classroom or through research literature or professional development.</td>
<td>“‘Here are the problems that have arisen. Here's the teams that I definitely need to meet with today.’ That's what was fun with me, because I was lead learner. For instance, I had no idea how to make a website. So when students asked me, I'm like, ‘No. Uh-oh.’”</td>
</tr>
<tr>
<td>Creativity and Innovation</td>
<td>The teachers implement activities that enhances critical thinking or engages new ways of approaching literacy.</td>
<td>“And [our principal is] like, take risks and figure out what works for your classroom. I'm not going to like make you do lesson plans a certain way and not make sure you follow your textbook and like all these different things…we can like really stretch here and do what's best for kids and be an inquiry based staff.”</td>
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<tr>
<td>Peer Mentors</td>
<td>Teachers acknowledge the impact of collegial professional relationships.</td>
<td>“And I also feel, too, [a peer] is not afraid to step in if they see something is not going really great in your classroom. And they don't step in and say, ‘Hey, you're doing this wrong,’ but they know how to spin it to where, ‘Hey, I have this great practice—Why don't you work with me with this and we'll both try it.’— they have a nonchalant type way of pushing best practices…without being forceful, and being demanding, and being arrogant that this is the best way to do it. But they're being helpful.”</td>
</tr>
<tr>
<td>Community Literacy</td>
<td>Teachers engage in rhetorical practice for inquiry and social change through a hands-on experiential and strenuously intellectual engagement with the world (Flower, 2008).</td>
<td>“A lot of [community literacy was] like sucking from the community, which I feel like we do a lot anyway in a rural area. I was like, ‘Man, I would love to see some sort of solid example developed where you're giving back also.’ The kids are giving just as much and they're also contributing to the community – really making that – what is supposed to be the cycle, actually working.”</td>
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*Figure 1. Codes, definitions, and examples. Please note that some text was double-coded.*
Interpretations

Figure 1 below illustrates the instances of the emergence of codes from each teacher’s transcript. The following sections unpack these codes.

![Research Results](image-url)

**Figure 1.** Instances of codes emerging for each teacher participant.

**Teacher as learner.** All three teachers displayed attributes of teacher as learner and researcher. Michelle Collay (2011) writes that as teachers we come to know ourselves “as capable and smart and can lead only when we recognize the work we do as learning...[our] individual journey is the nucleus of our practice because the work of leading learning is deeply personal” (p. 66). Edwards and Hinueber (2015) write that setting aside time for learning is crucial for teachers to become teacher leaders and schools should protect time for teachers to learn (p. 27). Camille was explicit about teachers as learners being leaders:

They are constantly trying to improve their practices, their beliefs about teaching, but they're also still being a learner themselves. And I think that's the biggest part, is that teacher leaders are constantly learning and putting themselves as students, instead of just
that teacher role, which yes, the teacher role is very important for a teacher leader, but we have to be open to being a student and learning not just from different teachers, but also learning from experts as far as doing our own research.

Katrina referred to her community online literary magazine and how it came about after she had reflected upon a prior community literacy project that left her unsatisfied:

So I wanted them [students] to pick one person. Surely there is one person from this town that has given you something, and we are going to explore that person in depth throughout this year. So every writing assignment tied back to that person. At the end of the year, they had this big reception where they would come in and honor the people and there were displays. It was really moving, but I felt like throughout the entire year, we spent a lot of time building to this one pinnacle moment.

So yeah, we had archived in a way, but then what? What happens? It’s public for that moment. We had books published, but then those get – it just felt like, ‘I think we can do this better, in a more meaningful way.’

As noted earlier, Sandy had continued her education throughout her career by enrolling in course work at our institution, but she also spoke of co-learning in her classroom:

And I model everything I do. I write with them. I read on occasion with them. We read closely. We talk about what that means, model that. We write based on what they read, or the content area, text – the depth of text. They would write longer pieces and we'd just follow the writing process and I model and conference and we go to the library every other week together as a class and we talk books all the time…I have to take them where they are, wherever they are. And I work really hard to convince them that everybody is a
leader and everybody is a writer and by the end of the year you will be a better reader and a better writer.

All three teachers understood that teacher leaders are those teachers who continue inquiry into their practice whether it is seeking an advanced degree, engaging in professional development seminars, keeping field notes from her own classroom, or partnering with a strong peer mentor who contributes to her learning.

**Teacher as Advocate.** All three teachers believed that advocating for their students (both individually and collectively) was a criterion for teacher leadership, echoing Hunzicker (2013) and Collay (2011). Camille noted that advocating for her students meant she maintained open communication with parents:

‘So and so did not do their homework. They need to have it turned in by tomorrow,’ and then the kids come in the next day, and they're like, ‘Oh, my gosh, you e-mailed my mom?’ and I'm just like, ‘Yep. Well, sorry.’ So they know very early on that I have this complete open communication, and I am working with your parents, and I think it blows their minds a little bit, because a lot of, I mean, a lot of teachers don't do that…so I love being able to do that for my kids and create that open – we're kind of like a little family, and I'm gonna – we're gonna work together to get this done.

For Camille, advocating for her students was directly related to constant communication with their parents. She spoke extensively about the number of emails she sent on a weekly basis, because for her it was important that parents understand that she did, indeed, care about the intellectual and physical well-being of her students. Camille also said that she spent a great deal of time browsing websites to find grant opportunities (and taking the time to write the grants) that could fund her classroom library or provide money for technology projects.
Katrina describes how she advocated for a student athlete who was secretly writing poetry and whom she encouraged to submit poetry to their literary magazine:

There was one guy who had throughout the year brought me poetry that he had written and imagine the most macho, I mean ripped teenage boy that looks unnaturally huge, like, just ginormous dude who’s constantly, like, puffing his chest out, really trying to be as manly as possible, really quick to be angry and, like, wanted to seem very intellectual and – but then wanted to hide it and couldn’t, would bring me these poems and would ask for my opinion and so I suspected that he was writing [laughs] them, like, but he would never really admit to it and he opted to be a writer for the [literary magazine] but he told everyone he was helping with graphic design and he was kind of doing dual things but writing was, like, what he was really after.

So he wrote a couple of poems, submitted them in our – the – Selection Criteria Committee made sure that everything was anonymous so everything filtered through me. They wanted all names taken off of everything and everyone was assigned a number instead. And so anonymously things were rated. He was in the Top 20 percent. His poem got picked and he, like, yelled and he was, like, all excited in class. He’s like, ‘That was my poem, guys’ and it’s, like, ‘What? Like you wrote that? Whatever,’ like, and he’s talking about, like, started saying, like, ‘Writing poetry isn’t a girl thing.’

Advocating for students was the highest priority for Katrina. She was constantly self-assessing ways in which she could improve the instruction in her classroom to meet the needs of her students. She particularly honed in on how to make learning meaningful for students whom most would have considered, “checked out.” Because this was her greatest priority, she worked
tirelessly to enact her online literary magazine. For Katrina, advocacy for students was directly tied into her community literacy project.

As a veteran teacher, Sandy was more comfortable advocating for a student with personal dire circumstances. She was undeterred by what some younger teachers would have considered a risk if seeking tenure:

Last year, my project was Chloe, and her dad came at parent-teacher conferences, and he was this six-foot five, broken, physically broken, man who sat in front of me and cried, like I'm crying now, and said, ‘I can't do it. I have to have help. These are – this is my daughter, and I don't want her to make the same mistakes I've made.’ And then I got the backstory, you know, a short version of the backstory, and I said, ‘Well, here's the deal. You know, every year, I have a project, and they don't know who they are.’

But this year, I will tell her, and she will know that I am there. You know, I am on her shoulder and her conscience. And so she would sign – write her names on her papers, ‘Chloe, Your Little Project.’ And she had a hard year, got suspended multiple times for alcohol and tobacco and I don't think any drugs, but alcohol and tobacco multiple times. And while she was suspended, I would write to her, which I think we're not supposed to do that – I don't care, really. I don't care. You know, if they're gonna get me, then they can get me for doing that. They just can. And she would write me back.

Sandy was willing to sacrifice her own teaching career at the expense of advocating for a student who clearly needed one-on-one attention and care. Because Sandy had lived her entire life in the community, she knew the needs of many of the families and at-risk students. As a teacher whom parents trusted, she displayed a keen understanding of the need for privacy when interacting with the marginalized in her rural community.
Teacher as Mentor. All three teachers acknowledged the role of peer mentors in shaping their leadership ability. Shillingstad, McGlamery, Davis and Gilles (2015); Hunzkicker (2013); Poekert (2012); Edwards and Hinueber (2015) acknowledge that developing collegial relationships is essential in developing teacher leadership dispositions, that is, the act of seeking side-by-side support of peers is crucial in developing teacher leaders. Sandy didn’t speak about her peer mentors but acknowledged she had been a mentor many times over the years and would have two novice teachers in her building the next year. She noted that one thing she would do as a peer mentor was to validate them as teachers. She said, “And we as teachers really don't receive much validation. That’s where I’ll slogan. And I think maybe that’s why I’m so passionate about what I’m doing because I feel like teachers don’t get that.” She also acknowledged it would be helpful if she could have training sessions for the staff and assist them in teaching. As novice teachers, Camille and Katrina both spoke of influential peer mentors. Camille’s relationship with fellow ELA teacher Katie made the difference in her new school after an experience in her first school where she had no mentor:

And I think, too, is they're always – they're always reflective, and they're always seeing that they can learn from other people. It's not, ‘Okay, my – I am the top dog; I'm done. Everything you do is awesome.’ And [Katie] and I have had a lot of conversations about how she's learned from me, and I've learned from her...And I think that’s what a mentor-mentee relationship is going to be. It’s not the mentor telling you everything, but you're going to gain insight from both perspectives. So, I think that's a good teacher leader mentor.

Katrina’s mentor was her district’s instructional coach and former department head and she spoke about consulting him concerning her anxiety in her new role:
And I was humbled, but it was really hard at first, because I was the rookie and so like Brian really had to kind of like push me out of the nest. Because I would still like let him lead meetings and still let him do some different things. It’s helped we’ve had some like different turnover in our department. And so that’s kind of like shaken up our dynamics a little bit. And I’ve just gotten more comfortable with being more bold. And Brian and I have really started to work really well as a team, like a leadership team.

Camille and Katrina both spoke about their mentors as teachers who were willing to think with them, rather than the expert who believed she or he had all the answers. Both of their mentors understood that the best way to support them was to encourage them to get their feet wet and try new strategies or move beyond the four walls of the classroom. And that it was alright to fail, because in order to be a creative or innovative teacher, failure is an integral part of the process.

**Teacher as Creator/Innovator.** Faulkner and Latham (2016) characterize a teacher’s creativity as having a growth mindset and a sense of an adventurous life. Citing Dweck, they characterized growth mindset where “challenges are embraced by those welcoming change, as there is belief in intended growth. Effort therefore is seen as worthwhile while failure and receiving feedback is positive, guiding further improvement” (p. 138). They link “adventurous play to rigorous work that fosters creativity, and can produce innovation essential for all fields of endeavor” and see adventurous teachers as those, …who embrace change, seek new challenges, take risks, are resilient and face fears.

They continually expand their teaching and learning both for themselves and their learners. Adventurous teachers undertake a lifelong learning quest, a journey into the
unknown both physically and intellectually, building and strengthening their professional identities. (p.140)

Henriksen and Mishra (2015) in a study of past National Teacher of the Year award finalists describe creative teachers as those who engaged in intellectual risk-taking, cross-disciplinary curricular connections, and whose creativity in their personal endeavors contributed to their professional creativity, “The teachers…described creativity not as a process or skill that is discrete or separated from other thought processes, but as an integrated aspect of their thinking” (p. 18).

Camille’s field trip to an outdoor writing site and subsequent public poetry slam were considered creative and innovative, but she also spoke about developing podcasts centered upon argument writing by constructing a murder scene where students had to collect evidence, indicating she was consistently utilizing practices to enhance learning. Katrina’s online community literary magazine displayed risk-taking innovation and creativity. She gave over the reins of her classroom to her students who became responsible for all the important decisions for their magazine. Students made decisions about whose work was published, how the webpage was designed, how they marketed the magazine, who they consulted with, how they communicated with rejected authors, and how they publically launched the magazine. Katrina aligned with Faulkner and Latham’s (2016) concepts:

Yeah I’ve grown more confident in taking risks and I think our administrator has really done a great job at making it a safe place to fail and that was something I was never good at. I was good at everything academically growing up and so I didn’t like the idea of failing so I was really safe in the beginning, like, stages of teaching, like, I take a lotta risks because I don’t want this to go badly but I’ve loosened up enough to say, like,
'Okay we can learn from just as much from failure as we can from success and maybe even more’ and so I want to take these, like, risks within the classroom and so I think that naturally bleeds also into, like, leading out and teaching other – encouraging other – teachers to do crazy [laughs] things, like, and I get really excited about it, too.

Sandy was also clearly a risk-taker who was willing to forego school policy in keeping a dialogue going with an at-risk student while she was out of school for disciplinary reasons. Sandy’s personal creativity clearly influenced how she taught writing in her classroom. As a talented poet and writer, she brought that creativity into her classroom every day.

Teacher as Risk-Taker. Teacher leaders are creative and innovative lifetime learners who advocate for their students and work collegially with their peers. Camille, Katrina and Sandy overwhelmingly spoke of community literacy as a trait of teacher leadership. For each of them, that connection to their community members played a significant role in what it means to be a leader. But enacting community literacy projects means they must become risk-takers who aren’t afraid to fail, learn, and revise or try again. In my own work in a secondary school, there were failures and experiences I revised from year to year, trying to get at the best ways to approach literacy through practices that enhanced learning and meaning-making.

Although Camille and Katrina were both new and untenured teachers who considered it risky to engage in community literacy due to expectations of teaching the curriculum, they both enacted their projects. Both had strong relationships with district administration and constituents who supported their projects’ efforts. Shillingstad, McGlamery, Davis and Gilles (2015); Edwards and Hinueber (2015); Ringler, O’Neal, Rawls, and Cumiskey (2013); and Nappi (2014) concur a school’s principal plays a key role in developing teacher leaders. Poekert (2012) writes that teacher leaders must take risks and be vulnerable. Neumann, Jones and Webb (2012) note
that teachers who act as leaders improve the entire school community, not just manage their respective classrooms:

Teacher knowledge is much more than knowledge of what happens in a classroom, more than understanding content knowledge, pedagogical content knowledge, learning theories, and classroom management strategies. Being a teacher means becoming a professional leader who is active in the political environments of the school and the broader community. (p. 10)

Camille maintained a close relationship with her administrator and requested and received funds and transportation for her students to enact her literacy project. She spoke enthusiastically about her poetry slam project:

And then with the community, the two times that I was able to really utilize the community was our field trip and the poetry slam for this semester, at least, but the kids were so bought into it. Their engagement was through the roof, and they were dreading the poetry slam, but then once they got there, and the atmosphere, and they were hearing everything the kids were saying, I mean, it was just through the roof. I couldn't have asked for a better first experience doing that unit, 'cause I had never done it before. I mean, it was perfect.

Katrina had the unequivocal support of her building administrator who was actively engaged with her students throughout the process. Katrina’s principal empowered her and her students to enact their literary magazine:

He was a huge resource to us and really supportive of – like really excited when you come to him, like, ‘I want to scrap this whole novel to do this. Can we do that?’ He says,
'Yes, how can I support you? Yeah do it. Go make it happen. Whatever is going to support learning better.'

We were in the commons, because I just wanted to be out of my classroom. So I'm using the lunch tables. Students were working on things. And I walked over to him. I was like, ‘They want to do a literary magazine.’ And this was one of my most apathetic group of seniors. He was like, ‘If they already want to buy a ticket on the rocket ship let’s fly the thing.’ Those were his exact words. Like if they’re already buying in let’s do it. He’s like scrap the rest of your year. Let’s do this. If they’re passionate about it, we have not seen these kids be passionate about one thing all year long. So let’s make it happen.

He was so supportive of it the entire time. He would walk by, one day he came into the computer lab while they were trying to work, and sat down with some kids. And so he’s excited, and he’s willing to take a risk and then be like, ‘Oh, it didn’t work very well. We’ll try something else.’ He’s not afraid of it. It’s awesome.

The success of Camille and Katrina’s community literacy projected hinged upon the support of their administrators and his or her belief in the expertise of them as teacher leaders. Both saw increased engagement in their students, especially Katrina. She noted that her senior students were unmotivated and usually showed up to “go through the motions” until graduation day. Sandy had strong relationships with her constituents and was considered a community leader, but she felt she had never had a true administrative leader:

Over time the leadership that I’ve experienced has really been on an individual basis. I’ve had no administrators who were teacher leaders and instructional leaders for me ever. None that had anything to offer about what I already knew. So everything that I have
done has been trial and error and on my own, or networking with other teachers in the building or other teachers in the same content area.

Despite a lack of support from her administrator, Sandy continued her own community literacy project in her selection of a “student project” where she sustained a personal relationship throughout the school year.

These three teachers learned what I learned so many years ago, enacting community literacy cannot happen without the support of a lot of people. Without my administrator’s support or the engagement of community members, my students would not have had the chance to learn that they were vital and contributing members of our community. They would not have learned that literacy is more than reading a novel or writing a five-paragraph essay. Through enacting a community literacy project, they learned that it’s important to give voice to everyone in a community and there are many citizens who serve as experts and resources. They also learned what it meant to have an authentic inquiry that asked them to bring their curiosity into focus.

Conclusions

Teacher preparation programs interested in preparing teacher leaders who enact community literacy projects must first begin emphasizing in their curriculum the kinds of literacy practices that facilitate ongoing communication with administrators and constituents. The role of the building principal is key in supporting teachers who might fear failure or pushback from the community or students. Administrators must support the freedom to ask the compelling questions focused upon the needs of our communities. Teachers need support in developing these skills necessary to advocate for structured time to co-create literacy projects that can enhance and sustain local communities through economic, cultural, or environmental
investigations. Moreover, teacher preparation programs must continue to encourage and nurture teachers to be curious explorers who investigate issues or concerns in their community, and acknowledge that failure can elicit deeper meaning for teachers and their students.
References


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Making History a Verb in Literacy Research

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Our premise within this paper is to make a case for an expanded perspective for
the conduct and use of history within our field. Let us begin with a simple premise. Here
we point to a statement in a recent article that provided the rationale for a graduate level
course on the history of literacy instruction in which King and Stahl (2012) stated,
“Literacy education has a ‘secret’ history. It is a secret because so few in the profession
know about it. … At this point, the literacy profession is not systematically aware of its
past” (p. 241). Hence, we advocate for a greater presence of historical perspectives and
the underlying historiography of and for literacy. We will present a defense of history, a
case on behalf of history, a proposition outlining what we believe is a new understanding
of history for the profession, and finally a set of opportunities for integrating history into
graduate-level teaching and mentoring of students.

With these objectives in mind, an underlying message we share is that each of us
holds the onus to be both knowledgeable and regular consumers of the historical record
and current historical research and also to ensure that our students will likely develop
such an academic worldview as these provide the very foundation of the profession. If
such is not the case, it can be called into question whether we are members of an actual
discipline or profession.

**Defending an Action Approach to Historying Literacy**

Given the premises that have just been presented, is there a need to actually
defend the role of history in the literacy profession? We believe that such is the case, so
let us continue by making and briefly examining two defensive-minded assertions:

The first assertion: There is no need to defend something that is rarely done.
Historical research on literacy and even more so on literacy instruction is rarely done, so
why defend it? Stated in somewhat of reserve logic, there’s a dearth of evidence to support this assertion.

A thorough search of WorldCat demonstrated might be called a banner and quite unusual year for books if you were interested in literacy before the modern era. Indeed, there were rather interesting works pertaining to Roman Judea (Wise, 2015), medieval Europe (O’Mara, Blanton, & Stoop, 2015), imperial China (Dennis (2015), 16th century Europe (Van Orden, 2015), and a historical tour de force from Socrates to digital literacy (Furedi, 2015). Topics associated with the history of literacy instruction were strikingly absent. A similar search of JSTOR, Psych Info, ProQuest, Google Scholar, ERIC, American History & Life, EBSCO Host, and others yields about 16 articles in 2015 on the history of literacy (two were published by scholars in the literacy field while the others were from authors crossing a range of academic disciplines). And a search of Proquests Dissertations & Theses worldwide of 505 literacy-oriented dissertations produced two dissertations defended on the history of literacy, both focusing on China. In contrast, how many books, articles, and dissertations were published in 2015 on disciplinary literacy, or comprehension, or vocabulary instruction? And yet, it is dubious whether these many studies even addressed the historical bases of the very constructs researched.

So why defend a mode of literacy research that is rarely done by literacy researchers who hold appointments in schools and colleges of education, and who attend conferences promoted by scholarly associations such as the Literacy Research Association (LRA), the American Educational Research Association (AERA) the American Reading Forum, or the Society for the Scientific Study of Reading or the large
theory/research to practice oriented conferences such as that delivered by the International Literacy Association (ILA) or the National Conference of Teachers of English? We will get to an answer there.

Our second assertion: There is no need to defend something that is not being attacked. A defense is made in response to--or in anticipation of--an attack on something that is actually ‘present’ in some sizeable way. Who has been attacking the paltry presence of historical research on literacy in the last decade or two? or three? or more? There is no one of which we know. For sure, there are the insider scholarly squabbles that serve to clarify this interpretation of an era, person, and idea, or, a particular teaching practice and instructional material. But if we were to assume the type of attack such as delivered against qualitative methodologies in years past, there is just not the same type of attack leveled at the meager body of historical research on literacy. “Out of sight, out of mind” is far more than an overworked cliché, but an actual description of the historical community in literacy.

So why defend a mode of literacy research that is rarely conducted, not attacked and all too often unknown, overlooked, or simply ignored? What is there to protect, guard, safeguard, secure, or shield? Why defend a body of literature or scholarship that often passes from current interest to the deepest recesses of a library’s basement archives or an academic version of the dark web in a matter of milliseconds?

Although this article is not the venue to spell out all the good reasons for defending historical research on literacy--you can read these perspectives in their entirety across the scholarly articles and chapters authored by members of the now defunct History of Literacy Special Interest Group of the ILA and the History Integrated
Community Group of the LRA (e.g., Moore, Monaghan, & Hartman, 1997; Stahl & Hartman, 2011). We do believe that this article is the forum in which to suggest that it is the time in the discipline to view it history and practices of historiography through a new lens.

The Case on Behalf of Historying Literacy

Historical research matters more than any of the other types and topics of research presented annually at literacy conferences or in impactful literacy journals. We know that such a statement sounds like the teenage cheerleading at a sports event of “We’re Number 1, We’re Number 1” … but before dismissing it, let us first put forth three arguments that explain why historical research on literacy is so central to the literature that pervades our scholarly journals, edited texts/handbooks, and other authored works in spite of its relative absence in print. As the most read book in western history says, “The least shall be the greatest among you” (Luke 9:48). And in our case, the least published and paid attention to area of literacy research is really the one of greatest importance. We present three arguments for consideration.

The first argument we call the Rigor-in-the-Method Argument. By rigor in method, we mean that the history of literacy provides a unique, one-of-a-kind rigor for understanding the field quite unlike that achieved with other methods of research. It goes without saying that doctoral students and master’s students undergo training in procedures and protocols for understanding, critiquing, and conducting a range of qualitative and quantitative research methods. The importance of rigor is impressed upon them throughout the training, and it certainly is driven home during the dissertation experience. However, we propose that there is a third opportunity to train graduate
students in the importance of having rigor in method. The field of historical research in literacy (as opposed to the history of the field knowing full well that one cannot truly divorce the two) employs a research model (Stahl & Hartman, 2011) that is built upon a degree of rigor that is of equal strength as that observed in the qualitative or the quantitative methods making up the vast majority of studies in the field. The practice of historiography provides a third form of methodological rigor in the ongoing quest for knowledge and understanding of literacy processes and products. Further, it is a forum for triangulation across research methods.

We suggest that the processes of choosing the topic, collecting evidence from primary sources and appropriate secondary sources, evaluating evidence through external criticism and internal criticism, working with evidence, analyzing and interpreting evidence across categories such as time, informant, and subject, and then finally writing the scholarly paper, article, dissertation, or book all the while avoiding critical errors such as presentism, the teleological fallacy, and vagueness provides a fundamental understanding of processes that should be undertaken in all other forms of literacy research (Sears, Hartman, & Monaghan, 2010a; Sears, Hartman, & Monaghan, 2010b; Sears, Hartman, & Monaghan, 2010c).

The second argument we call the Language-for-the-Future Argument. By language for the future, we mean the history that literacy provides a language for the future. And our future is one where “historical and cultural competency” is a social, political, and economic imperative, right now, in the contemporary world. Many of us grew up in an era where our teachers regularly informed us that the world was getting smaller and smaller. Still, little could we have contemplated a world so intertwined that
an action in China or Greece could influence the number of individuals able to attend an ILA Convention.

To be sure, the notion that the historical study of educational/literacy practices, cultures, materials, and languages is necessary for negotiating the complexities of the modern world is scarcely novel (Downing, 1973; Stahl, 2002), but it may be downright scary to think of it in the second decade of the 21st century. Still it is the history of various nation states, cultures, and groups of people that allows us to understand the present and approach the future. Furthermore, it is the history literacy and its pedagogy in each of these constructs that provides the cornerstone, if not the full foundation, of each individual society and to a greater degree the life events each and every day in a single global society. We can only talk about our future by fully understanding and appreciating the past. Furthermore, it is clear that such an understanding and appreciation no longer knows national borders. For instance, to understand the fallacy underlying the American fascination with the Finnish education system, you have to not only know both the American system and the current Finish system but more so one must understand 1,000 years of Finnish history.

The third argument is the Nothing-is-Permanent Argument. Here we mean the history of literacy forms a mindset that is fitting and necessary for this era: Nothing is permanent or certain. In the long-term, the most stable findings are to be viewed as provisional, at best. Given more data, another perspective, a different instrument, another population, a new or revised question, a novel setting, or some other “another,” a truism that looks so permanent now will be understood in a different way at some future time. To know the history of literacy’s past is to realize that the only thing of permanence in
defending our research is change itself. For example, when Donald Durrell found in his 1958 *First-Grade Reading Success Study: A Summary* that knowledge of letter names was the best predictor of later reading achievement, a strongly formed historical mindset understands that he had identified a *provisional finding* that would be fordone, undone, redone, or outdone when instruction in other eras, other contexts, using other writing systems (some of which have no letters at all, or even letter names), when other approaches were studied. Each of you with your own areas of specialization can think of examples where this phenomenon strikes home. Whether change comes as a massive tsunami sweeping away all in its path or whether it comes through predictable increments, a common pattern of our time is that we cannot hope to understand the universe of change without understanding what came before in time and what has also been removed in space.

**Expanding the Zeitgeist of History for the Literacy Profession**

The preceding arguments might be considered logical support for a “history as usual” vantage. They are certainly convincing in that regard. Now, we ask you to expand your current understanding of history, to adopt a new perspective which we believe would have major benefits to our field. Consider the word *History* and its underlying concept. Think of your past experiences across your lifespan with history. Most of you immediately think of something like your eighth-grade United States history class or maybe your college freshman experience with a class in world civilizations or perhaps that couple weeks in a doctoral class where you perused or more likely skimmed *American Reading Instruction* by Nila Banton Smith (2002). We can conjecture that you most likely see “History” as a noun. Yet have you ever considered that the word would
have far greater and far reaching impact upon society and our discipline for that matter if we considered it to be a verb, and an action verb at that?

Our rhetorical task emerges as how to project our desire for “more history of literacy” onto others, a persuasive argument. Consider then, literacy is in need of a change up in grammar and vocabulary related to this problematic lack of history (because everyone loves some grammar). So, let us now also consider history as a verb, as in “This paper will history literacy.” What would the entailments of such a grammatical shift involve? Acknowledging the awkward roll on the tongue, the verb *history*, to *history*, would involve activities in literacy that engage with antecedent events, people, material objects and practices involved in the uses of literacy, or as it once was known, reading. We *history* literacy by inverting our field, making it a context within which to conduct historical inquiry. Think of it as a reversal on disciplinary literacies. However, from a literacy perspective, the inquiry itself (the historical work) is an instantiation of the field of literacy. It is a doubling effect. This is the same persuasive talk literacy folks have been shelling to the disciplines, but redirected to ourselves. After all, literacy must be about something, one, place, event…. 

Let’s then consider a more concrete example that serves as an exemplar for our proposition. Last week, while engaged with a struggling third grader, one of the authors and his friend, the third grader, took a tutoring break to look at some 360-degree Virtual Reality videos on a Googlecardboard viewer. Needless to say, the tutoring partner was blown away (not to mention his older brother and mother). The third grader spontaneously produced verbal protocols while he watched the Virtual Reality examples in [www.with.in.com](http://www.with.in.com) He also read aloud (or at least attempted to do so) textual messages
that played across the screens. A record of his protocols was recorded. Looking back on
the protocol, it is evident that he hit most of the comprehension strategies that are
recommended by Tovani (2000). Very easily, almost completely, he summarized each of
the videos. After all, he was the only one to see what had transpired, so a summary for
the non-viewers seemed a reasonable communicative request. In reader responses like
those recommended Bleich’s (1978) in Subjective Criticism, this third grader brought out
the underlying romance revealed by a boy and girl in one of the within VR videos as the
film’s protagonists flew paper airplanes across a chasm and into each other’s windows. In
talk after viewing the videos, he compared the VR experience to both regular, 2-
dimensional videos, and (surprise to the adult) a Viewmaster. So, what can this mean in
terms of historying literacy?

First and most importantly is the ability to see previous literacy practices as they
occur in newer media contexts. We do not necessarily mean electronic media. For
example, consider a reader’s or teacher’s abilities to see reading “strategies” in the
collection of a picture book (rather than in the basal where the strategy might have been
taught). In the case of the previous example, historying the VR event meant importing
text-based comprehension strategies, and reader response originally designed for textual
literature. Clearly, these historical practices are applicable and even productive. But how
do we access them if we start with VR, a novum.

Latour (1999) argues that the texts we “interpret” are in many ways bound to the
very interpretive versions we thought we “developed,” that is, our interpretations are
based on meaning inherent in artifact, practices, and rituals. In his analyses of science
knowledge, prior to the 1600’s Latour notes that “we are relatively sure of many of the
things with which are daily engaged through the practice of our laboratories.” Yet, the very surety was in fact based “on a number of relations established within the world.” (p. 4). “Relations,” in this context are established, entextualized meanings that adhere to and are inherent in cultural objects and actions. Much cognitive research has sought to account for this inherent meaning. Early research by Eleanor Rosch (1973; Rosch, et al., 1976) and her colleague Carolyn Mervis (1980) sought to establish bases for shared understandings different cultures may have for the categorization of common nouns.

Following from norms created by Battig and Montague (1969), Rosch established exemplars (most representative) and scales of representation for the various examples of concrete nouns (e.g., category furniture, examples chair, sofa, table). Rosch established ranges of prototypicality for various exemplars. Is the meaning in the object? No, of course not. It’s just a piece of wood. But, if the response within a bounded culture is so regular and reliable, it is safe to say that the meaning resides within, or is connected with, or is instantiated by the object or its label and thereby validating Latour’s thesis.

More recently, the objectivist conceit has been surrendered to constructivism, and “objective reality” resides in individual minds. Latour’s critique reminds us that previous versions of reality are not retraced to their point of “error” but live on in a pastiche of palimpsest. As a result, Anderson (2016) suggests “we have found ourselves hopelessly entangled in a thicket of conflicting perceptions of reality of the means by which we understand reality [epistemologies], and the methods we can use to accomplish the means – conflicting paradigms” (p. 34, elaboration ours). More directly, Anderson quotes Gray’s (1968) commentary on Heidegger; echoing Heidegger’s belief that “the only way to go forward is to return to the origin and seek a new beginning.” (p. xiv). The point of
this matrix of citation is to reveal the deep value in *historying* literacy by engaging with previous instantiations of an idea. It is a fact that previous manifestations of any idea continue to circulate in a cultural context. Often, literacy people may be using the same literacy term and meaning very different things, or talking about the same literacy phenomenon but using different labels. Historical antecedents are the place where these conflicting and overlapping meanings come out to play.

The Virtual Reality (VR) video cannot have come into existence without the accompanying history of how it came to be. We suggest that an important part of comprehending a VR video (not to mention any other text of any other modality) is the need to entextualize the current experience as a consequence of the iterations that preceded it. Instrumentally, the VR is preceded by video (and several version of that – VHS, Beta, DVE, iMovie, MovieMaker, …), preceded by home movies on 8mm, preceded by photographs, film, paintings, cave drawings, and so on. We wonder, what does it cost in understanding when the present version is all that is known?

It is reasonable that these questions of origin, development and evolution were not in the mind of the third grader when he was captivated by 360-degree videos. Nor do we suggest that they should have been. Rather, he was appropriately engaged with what VR’s textual array had to offer. This is a user’s engagement with text. But, what about his teacher? In order to isolate a “strategy” from a stream of student behavior, the teacher needs a notion of strategy, what they are, what they do, from where they emerge whether as a strategic/cognitive process or as a simple parroting of “prototypic strategies” as proffered in reading series and K-12 methods books. It is necessary that the professionals who teach understand the emergence of strategy, how strategies differ from skills, when
and where skills and strategies are in harmony and in conflict, and how they might assist/deter the work of an individual reader. This is our professional repertoire and knowledge of it contextualizes the choices we make on behalf of our clients. (Ironically, the term strategy was used as a verb in its earliest renditions in the Oxford English Dictionary.)

An Example of Historying Reading Intervention

Perhaps using an example from the hierarchy of the eight moments of modern literacy instruction (cf. King & Stahl, 2012) will history literacy more directly. During the Clinical Moment of literacy certain components of reading instruction was based on medical models. Individual “problem,” “disabled” or “remedial” readers (presumably readers not making the grade in classroom-based instruction) were brought to reading clinics, whether university, private, or school district based, to be tested with assessments thought to measure all manner of reading sub-strata (word attack, syllabication, main idea, structural analysis, …), as well as possible “deficits” in perceptual acumen, attention spans, memory capacities, and, most importantly, IQs. The underlying thought was that once the missing element was identified, it could be rigorously taught, the missing part grafted or otherwise restored, and functional reading resumed. Or, in the case of depressed IQ scores, expect less from a struggling student. This is literacy work of Durrell (1937) [later edition with Catterson], Harris (1940) [later editions with Sipay], and Bond and Tinker (1957) [later editions with Wasson and Wasson] as example scholars.

In the Cognitive Moment (King & Stahl, 2012) that followed, young readers were also taught individually, but from a somewhat different perspective. Specially trained and
socialized teachers (Lyons, Pinnell, & Deford, 1993; Deford, Lyons, & Pinnell, 1991) carefully observed and recorded young “at-risk” readers’ literacy behaviors in order to determine what they controlled, to step in when it is productive to do so, and to actively shape the emerging reader to the point of recovery (or performance at an “average” band in the students’ classroom). In addition to the work of Reading Recovery, cognitive modeling of the literacy mind was the work of the scholars from the Center for the Study of Reading at the University of Illinois at Urbana-Champaign. For more context, see Spiro, Bruce and Brewer’s (1980) *Theoretical Issues in Reading Comprehension: Perspectives from Cognitive Psychology, Linguistics, Artificial Intelligence, and Education* and the first edition of the *Handbook of Reading Research* (Pearson, Barr, Kamil, & Mosenthal, 1984).

Currently, in a time of managed, curriculum-based, whole class reading instruction, individual instruction in literacy is reserved for Tier 3 students who have been strained through the sequence of triage in Response to Intervention (RtI). To reach desired outcomes in school, some students may require additional or unique instructional strategies or interventions beyond those typically made available. Tier 1 interventions are designed for whole class interventions, where 80% of students will successfully respond. In Tier 2, at-risk students receive small group interventions designed to meet the needs of those students who fail Tier 1 interventions. In Tier 3, individual students receive intensive reading support from specially trained learning assistants, such as reading teachers. But placement decisions in RtI result from considerations three sets of factors: 1.) comparisons to other students in the class; 2.) against an established benchmark for the competency; and 3.) as a result of triage from Tiers 1 & 2 (Ervin, n.d.). As a result,
students who continue to experience reading difficulties despite the class-wide interventions can be referred to grade-level teams and considered directly for Tier 3 intervention supports (Ervin, et al., 2006). For example, if the information collected suggests that the student has the prerequisite skills needed to decode connected text but does so slowly, one hypothesis is that the student has not had sufficient time to practice reading to develop fluency. An appropriate intervention for this student might focus on building reading fluency through an intervention that involves increased reading practice, such as repeated reading. In general, the intervention processes for fluency training at Level 3 are more intensive and individualized than would be the case at other Levels 1 and 2.

To say, as one might, “we’ve always had one-to-one instruction in literacy” is in some ways a truism. But such an assertion misses so much nuance, valuable descriptive detail, and teleological stances contained within each of these three example paradigms (and others like them), which define and use “individualized literacy” in very different ways. These forgotten or overlooked instructional facts and social habits from the history of reading are what shaped teaching choices as they were enacted by in-the-moment teachers, as well as influencing teachers’ selection of specific procedures and materials. However, when we history one-to-one literacy instruction, a very different picture develops. In the first example, the reader is a medical client, acted upon and (hopefully) cured. In the second, cognitive example, the reader is “recovered” by a carefully observing teacher and her cadre of support teachers, who all study the observation data, compare it against established norms and conjure ways to get the “struggling reader” up to snuff. In the third example, Tier 3 may mean more of the same, but with an individual
teacher. As expected, in a curriculum-based model, students do not change, only the way they are treated by the curriculum.

Isolated historical facts, like the use of hornbooks, and reverence for antique text artifacts, like McGuffey Readers, are interesting and important to literacy folks working in the history of literacy as a workspace. But we suggest that acquisition of isolated historical knowledge and artifacts will do little to situate the field in its successive historical contexts. In fact, reverence for “things historical” fetishizes history in a freeze frame of collected objects. Rather, different teachers working with all different ages of readers must be able to know a practice in its current use, and its previous uses. This deeper knowing involves both syntagmatic and paradigmatic understandings (Bynon, 1977). A syntagmatic approach to a construct distinguishes it from all that presently surrounds it, or how the practice or construct operates in relation to other practices at that time. For example, a syntagmatic approach highlights how word attack might function in relation to comprehension, or how it might differ in balanced literacy and RtI applications. In contrast, a paradigmatic approach to reading practices considers a particular practice, technique or material as it has manifested across time, like the category of word attack practices through the decades. Making history a verb invites our clients, teachers of reading, are able to history their way into and across reading practices. But we can also history our way through reading research.

A Recent Example of Historying the History of Reading

Issuing from the ongoing work of Jim Hoffman and Donna Alvermann’s (2016) analyses of Nila Banton Smith’s History of Reading in America (HRA) – a fascinating comparison of HRA 1934 and 1965 – Alvermann cautions that using a causal frame of
reference in historical analysis is inconsistent with the authors’ chosen Foucauldian
genealogy. Her caution is intended to help us avoid the trap of causal thinking, that X
causedit Y, something that Michel Foucault rejected in his genealogical model for doing
historical research (cf.: Birth of the Clinic, Madness and Civilization, Discipline and
Punish). This is the model Hoffman and Alvermann have chosen for their analyses across
versions of Smith’s History of Reading in America.

The following is our uptake and elaboration of their genealogical practices. As an
eexample of this type of analysis, consider the idea or practice in question, for example
reading group size, or teachers’ grouping criteria, as it occurs in relation to the
surrounding phenomena, object, practices, and ideas. Linguistics uses the term
syntagmatic to describe the function of a bit of language, say a word, in its immediate
semantic, syntactic, and morphophonemic contexts (Bynon, 1977). Linguists often use
syntagmatic in contrast with paradigmatic, or looking at a single item, or phenomenon as
it occurs across various examples or instantiations. Syntagmatic is a handy word to
analogously describe what goes on in genealogical analysis in literacy. The point is to
hypothesize what enabling conditions brought forth the practice, the idea. Clearly, the
thing itself is not actually new, but the understandings now associated with it are new.
This alternative historical approach is strikingly similar to Deleuze and Guatarri’s (1987)
rhizomatic approach, which has had some play in literacy by Kevin Leander’s and
Deborah Wells-Rowe’s (2006) treatment of spatial literacies, and Joyce Masny’s (2012)
text on Deleuzean applications to literacy. Deleuze and Guattari credited Henri Bergson
and his philosophy of becoming for their theories of emanance and emergence (Deleuze,
1990; Grosz, 2005), and that notion of things always in process informs our own recommendations about viewing, using, and making history.

What we are recommending is that the sedimented, taken-for-granted practices within the field of literacy might be understood differently if they were treated to successive genealogical tracings as they correspond with what we have previously called the Moments of Reading Instruction (King & Stahl, 2012). Of course, the carving up of time into moments is not the point here, as any heuristic for parsing elapsed time will do. We merely suggest our history of reading moments as a convenient, extant model. So successively situating a construct that re-occurs across our history, as a field is the point.

To return to the avoidance of cause and effect thinking, for us the impact has been a realization that by not engaging in cause and effect thinking, we also avoid the overly determined, ready-made relationships which also exist in our field as objects. Because they are overly determined, cause/effect relationships reveal little new insight. At Deleuze and Guatarri’s urging, we follow the co-occurring, or what they call *enabling* lines of flight; until a rupture of something unexpected happens; an insight, a conflict, a noticing, a wonder. But neither the overly determined cause and effect, nor the enabling characteristics, nor any of the emerging knowledge is taken as “truth.” It is simply not the goal of the inquiry. Furthermore, emergent thinking can (and sometimes does) lead one back to cause and effect relations, as the following example reveals.

Alvermann and Hoffman presented several facts about Nila Banton Smith and the various editions of her text. In the 1934 version, Smith rhapsodizes on the benefits of a progressive, child-centered approach to reading instruction in what sounded like a Language Experience Approach (LEA). In another fact, according to Hoffman, in the
1965 edition, Smith completely deleted this section of progressive pedagogy that sounded like LEA. Coincidentally around this same time as the 1965 Edition, LEA again became accessible to the profession. This is an approach to teaching that proceeded from an experience shared with students, to talk about the experience, to writing down the talk, and learning to read from the talk that was written down. Stauffer (1965), Van Allen and Halvorsen (1961) were champions for this approach, though they were both predated by Gans (1941) and Lamoreaux and Lee (1943). But one might contend that LEA did not explode on the scene as a popular approach until after the Reading Study Project in San Diego (Van Allen, 1962) (see Hall, 1970, 1977; Stauffer, 1970; Van Allen, 1976; Veatch, 1973).

So, this difference in Smith’s editions is a fact, which is then played against a diachronic framing. “What factors were in play for Smith in 1934?” asks Alvermann. Smith was then a new PhD recipient, eager to publish her dissertation, facts also provided by Alvermann. But in 1965, a perhaps different Nila Banton Smith produces a different version of her text. Alvermann asks us to sit with these facts, bring our own perspectives to bear on the set of circumstances. When she mentions the possibility of our cynicism tainting the analysis, there is an unleashing of pent up restraint. Out pops “At what point did NBS become involved with authoring basal reading material?” Might an endorsement of child-authored texts used for reading instruction (as in LEA) be perceived as a conflict with sponsoring a basal approach? Our “discovery” about Smith’s decision making, conceived in the hands of Hoffman and Alvermann (2016), is not so alarming or clever as was felt at the time. Further, such a quick explanatory response may foreclose on alternative ideas. Also, it is probably impossible to determine the veracity of this
thinking, and it may even be too cause-oriented for Foucault. Perhaps the conclusion was too quick, certainly without support, but gathering support for this hypothesis would be the work of more traditional historical methods. But again, we are not after truth with a capital T, but instead interested in generating emergent thinking about historical facts and artifacts. Maybe Smith did delete the remarkable progressive methods from her subsequent editions to make History of Reading in America consistent with her basal text authoring. Maybe it is merely a coincidence. In any case, we now are joined with new thinking about Smith, her multiple editions of HRA, and our reasoning on profit and motive.

Implications

Collectively, we think that these arguments have consequences. That is, they form an imperative for action, the type of action we call “A Mandate for Historing Research on Literacy.” Hence, in closing we sketch out features for a proactive plan of action for the field.

1. Advocate for Doctoral Students. We need to advocate for doctoral students to have a course and set of coordinated experiences in historing their discipline of literacy and literacy instruction, research, materials, etc. Furthermore, we strongly believe that such an experience must go well beyond the simple reading of American Reading Instruction (Smith, 2002) so as to lead students to interact with primary sources (whether actual historical artifacts or authentic facsimiles) as found in collections at schools such as Northern Illinois University and the University of Kansas; and to become knowledgeable on a range of seminal secondary sources (e.g., Manguel, 1996; Mathews, 1966; Monaghan, 1991; Suarez & Woudhuysen, 2013; Venezky, 1984, 1987). Every
doctoral student should undertake a historying study, more than the simple presentation of the march of time, before the candidacy stage as was undertaken by Wyatt (1992) or by Dillon (1985) for the University of Georgia doctoral program. By focusing on doctoral students, eventually every program for master’s students and undergraduates will have faculty who know, value, and integrate history into their teaching, research, and service, and more so, that possess and value a professional and perhaps sophisticated personal world view that comes from experiences in historying the discipline. To be sure, there are a handful of doctoral programs in the country that deliver courses and experiences on the history of literacy (King & Stahl, 2012). But these offerings are not the norm for doctoral programs. And given the number of doctoral programs in literacy are growing, it is all the more likely that the next generation of doctoral students and members of the professoriate will not have undertaken a course or experiences to ensure historical depth or breadth.

Given this proposition it serves us to drill down into this point a bit more and return to our first argument Rigor in the Method. When one considers the research training that doctoral students receive in the second decade of the 21st century, we see individuals expected to be expert in either qualitative methods or quantitative methods, with “survival competency” in the other. The basic standard for the field is that the student needs to be able to at least read the research found in peer-reviewed journals and the ever-growing number of non-refereed but highly influential technical reports and policy white papers, and content-related postings.

Drilling down to the standards: In only the very rare case will an individual receive training in historiographical methodology. There is little wonder that such is the case in 2015 as it was the case in 2005, 1995, 1985, and so on. If you do not have a cadre
of literacy professors trained in methods beyond the two predominant avenues for research, the dearth in preparation will continue for the marginalized ways of examination and hence, greatly limit alternative ways of knowing and evaluation of theory and research. Indeed, without doctoral students receiving explicit training in the historical method as well as both breadth and depth of instruction in the historying of the theory, research, and pedagogy of the literacy field, doctoral programs are giving but lip service to the ILA’s 2010 Standards for Teacher Educator Candidates, which require candidates to: 1. Analyze historically shared knowledge in reading and writing scholarship and explain its role in an evolving professional knowledge base and 2. Reevaluate the relevance of historically shared knowledge for meeting traditional print, digital, and online reading education goals.

Such a situation has led to a form of myopia in practice where a related literature section of an article or even a chapter two of a dissertation need not trace research or practice back beyond a decade or two plus or minus the years of that author’s work in the field or the work of the individual’s dissertation director. At the very best this practice brings to light a fundamental weakness in a graduate student’s training, if not actually a blaring deficit in an individual’s professional zeitgeist regardless of positioning in the field.

We must prepare a generation of scholars that not only knows and values our historical accomplishments, but also understands and accurately critiques our follies. While many in our field are willing and able to offer critique in any number of topics, there are few who can or will provide critique from perspectives of historying the field. More so, we must impart an inherent value, if not an ethical stance, to each new
generation of scholars that it is their responsibility to protect our history from those who would misconstrue, if not blatantly misrepresent, the past for their personal gain or agenda.

2. Advance within/beyond professional organizations. A productive start would be to design and fully incorporate a presence within organizations that don’t currently have a historical conscience. The next step is to expand and empower literacy history’s presence in those organizations that have already taken the first steps of recognition. In a sense, this action begins with the appointment of both an archivist and an historian, and if such positions exist, the empowering of these individuals through direct charges as well as expanded support for historically oriented projects. Associations such as the LRA have embraced these advancements through sponsorship of a special interest group (Innovative Community Group) and a Historian, who conduct active oral history projects. (At the time of this writing, the History of Reading Special Interest Group of the ILA had recently folded.)

Examples of projects in the spirit of historying the field that explore and promote the history of the profession by the nation’s associations, as well as by state and local chapters, might undertake include:

- Create a book, monograph, pamphlet series, or web page on “all things historical” related to literacy focusing on and analyzing the mission of and past contributions of the respective association and its particular individuals;
- Sponsor a “New London-like” seminar with sessions on topics, issues, instructional practices, curriculum, and materials all historically considered;
• Sponsor historying oriented webinars and podcasts that could be used beyond the moment of their debut for wider dissemination within master’s and doctoral programs;

• Sponsor exhibits at annual meetings such as presented by Jennifer Monaghan and Arlene Barry at the 1999 International Reading Association Convention (see Monaghan & Barry [1999] for the Catalog);

• Present living history sessions at annual meetings. Living history would include pedagogical enactments of historical events such as a reading or writing lesson in 1843, or dramatic portrayals of historical figures such as Edmund Burke Huey, William S. Gray, Jean Chall, and others (see Hartman, D. K., & Davis, D. H. [2008] for an informative as well as entertaining example);

• Undertake oral history/life history projects designed to preserve the human library of the field’s heritage before it is lost to the times. These projects can be saved either as traditional interview/transcripts or with new technologies such as with iMovies, (King, 1991; Stahl & King, 2000) as well as other forms of biographer research (Hoffman & Alvermann, 2016; Denzin, 1989); and

• Create www sites such as developed by the Reading Hall of Fame (http://readinghalloffame.org) where literacy students and faculty can review biographically oriented sources pertaining to the field’s elite personage, both living and deceased.

Conclusion

We offer a final, although provisional, point: our field only becomes a profession when the members of our field can define, interpret, discuss, debate, and value our
history from various perspectives (social histories and critical histories as opposed to simple chronicling). Those individuals who are not the architects of historical thought must be critical consumers and perhaps enactors of history, people who *history* literacy. The key here is that there are multiple ways to interpret and use the past. Furthermore, each time we look at the past through a different lens we begin to understand our current era and gain the foresight to envision futures. Hence, understanding the historical foundations upon which current theory, research, and praxis rest is the key to our ability to construct the present as well as to propose postulates about futures in the field. In other words, it is time to start historying in your professional work, in your classes, and as an important aspect of your personal mindset.
References


Preparing Future Teachers to Teach Literacy in the 21st Century: Utilizing Digital Literacies in Literacy Coursework to Foster Applicable Classroom Practices

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Preparing future teachers to face the unique challenges of teaching in the 21st century is becoming not only an area of great prominence for teacher educators, but it is also becoming a professional responsibility. The changing demands of our classrooms and the incorporation of digital devices transforms how teachers navigate a space where there is a shared place for both traditional classroom practices and those that require knowledge of digital literacies and multimodal texts. These “new” literacies are socially accepted means in which people, “generate, communicate, and negotiate meanings, as members of Discourses, through the medium of encoded texts... and include examples such as, blogging, manga producing, podcasting, along with (traditional examples) like letter writing, reading literary novels, and so on” (Lankshear & Knobel, 2006, p. 50). We need to consider how we are preparing pre-service teachers to teach in the 21st century and how to equip them with the tools and experiences to make a successful transition into the classrooms.

Researchers recognize that literacies are continually changing and adapting and therefore the relationship between literacies and technology is transactional (Leu, Kinzer, Coiro, & Cammack, 2004). When quantifying “new literacies” Coiro, Knobel, Lankshear and Leu (2008) describe that, “new literacies are identified with an epochal change in technologies and associated changes in social and cultural ways of doing things... literacies are new in a more abiding sense of being a part of a historical phenomenon that is not fleeting” (p. 7). To adequately prepare students for a world in which our definition of literacy continues to change, we need to fully understand the means in which we communicate and how these practices shape current and future classrooms. The responsibility is then thrust on universities, colleges and
teacher educators to help prepare future teachers for this changing literacy landscape where the population of pre-service teachers are fully versed and experienced in digital literacies and multimodal textual experiences.

The purpose of this study was to investigate pre-service teachers’ perceptions of technology integration in elementary classrooms and determine how their experiences with using technology help or hinder their general conceptions of teaching in the 21st century. In particular, the investigation looked at the role of a partial immersion approach to teaching literacy through technology with modeled and integrated use of classroom technological applications. Immersion is imperative for a greater understanding of the technological tools (Mason, 2000), and this study investigated an approach to elementary literacy instruction that resulted in the pre-service teachers becoming proficient at multiple modalities of technology and equally adept at using technology in class and in their field placements. Throughout the 3-course literacy block the pre-service teachers utilized multiple mediums of technology. Various web sites and applications were modeled and explored through classroom activities and assignments and then implemented during concurrent field experience placements. Central to this work were the culminating final assessments: a student research inquiry project studying elements of chosen technology integration in elementary classrooms and a classroom vision statement aimed at understanding their views of technology integration for their own classrooms.

The primary research question that informed this study is: How do pre-service teachers perceive technology integration in teaching literacy in elementary classrooms? Three underlying questions also helped to clarify pre-service teachers’ perceptions regarding technology integration and their role in future classrooms. Those research questions are: 1) What inspires and contributes to their belief systems? 2) What experiences help to shape their perceptions of
technology integration? and 3) What are the pre-service teachers’ perceptions regarding the incongruities between technology integration at the university level versus technology integration in elementary classrooms? Since the coursework, experiences, and preparation is significant to consider how those various components work in tandem and also isolation to help contribute to the pre-service teachers’ perceptions, the research questions were designed to understand these various elements.

**Theoretical Framework**

The relevant research paradigm explored the pre-service teachers’ perceptions regarding the use of technology, their experiences using different types of technology and how their coursework, assignments, exploration and field experience may have shaped their vision for teaching. Social constructivist and interpretivist paradigms guided the research design, methodology, data gathering and analysis processes. The study is grounded in research from the fields of pre-service teacher beliefs and vision (Haverback, 2009; Mercado & Turner, 2010; Parker & Brindley, 2008; Vannatta, 2010), the growing body of literature regarding technology integration among pre-service teachers (Abbitt, 2011; Anstey, 2002; Cervetti, Damico & Pearson, 2006; Hixon & So, 2009; Koehler & Mishra, 2009; Vannatta & Beyerbach, 2000), and how the TPACK framework (Mishra & Koehler, 2006) grounds our understandings of technology integration. Pre-service teachers develop visions of classroom and pedagogical practice through experiences as students, education course work, and field placements (Parker & Brindley, 2008), which can be shaped and expanded as they acquire new strategies (Mercado & Turner, 2010).

Processing time, reflective thinking and examining one’s beliefs are a powerful means for understanding teachers’ classroom practices and behaviors (Hart, 2004). Additionally, action research has aided pre-service teachers in their inquiry and evaluation of teaching practices
Pre-service teachers often struggle to integrate technology in their field experiences due to the pedagogical complexities and educational contexts (Dawson & Dana, 2007). Yet, researchers found that opportunities for pre-service teachers to utilize technological tools in field experiences encourages technology integration and helped to shape their perceptions and attitudes toward technology integration (Mason, 2000). Pre-service teachers need to learn about technology through modeling and engagement and they need to embrace technology rich environments (Cervetti, Damico & Pearson, 2006; Vannatta, 2000). Most importantly, if pre-service teachers can navigate the technological landscape they can help their students understand how to draw upon various modes to meet the challenges of the twenty-first century (Borsheim, Merritt & Reed, 2008).

The TPACK (Mishra & Koehler, 2006) is a framework to consider the necessary knowledge a pre-service or practicing teacher must have in order to effectively deliver instruction where technology enhances learning. The framework was developed from Shulman’s (1986) conceptualization of pedagogical content knowledge (PCK); the knowledge teachers need to teach content effectively. The TPACK framework describes the coinciding areas of knowledge that are integral to teachers being able to teach content effectively with digital mediums and applications. Although the TPACK is an encompassing construct that helps to identify a useful lens to examine teacher knowledge, several researchers have enriched this conceptualization by adding other important considerations. For example, Vaerenwyck, Shinas & Steckel (2014) describe what they call the TPACK+ which is a bi-theoretical framework encompassing the TPACK but also adding sociocultural theory to extend the construct to include socially situated learning within authentic contexts. Similarly, Wilson, Zygiouris-Coe, Cardullo & Fong (2013) formulated the M-TPACK that widens the TPACK by incorporating metacognition
and teacher dispositions. M-TPACK describes how teacher dispositions (attitudes, perceptions or beliefs plus personal characteristics) especially toward technology is important to how teachers are able to incorporate technology, their confidence, and their self-efficacy. These constructs illustrate the need for considering not only the knowledge necessary to carry out effective instruction, but also the personal and social influences that are integral to make teaching with technology meaningful and sustainable.

These frameworks are important to practicing teachers and illustrate the many areas of knowledge a teacher must have in order to be successful in teaching content with technology. For a pre-service teacher these areas of expertise are just developing. They are only beginning to understand how to teach content and pedagogical methods to work best in different classroom situations. Therefore, it would seem extremely important to help these new teachers to have ample time, practice and opportunities to explore how to integrate technology. It is almost like learning a new language with an immersion approach, where a new language learner learns the oral, written and conceptual understandings at the same time. By immersing pre-service teachers with opportunities to incorporate technology into their literacy teaching, they should be able to assimilate into this culture of learning.

**Methodology**

Social constructivist and interpretivist paradigms guided the research design, methodology, data gathering and analysis processes. This method allowed the analysis of the pre-service teachers’ contextual worlds through the experiences they shared. I employed a qualitative research design to collect data that answered my research questions (Patton, 2002), and this was an exploratory approach to understanding how pre-service teachers perceive technology integration in teaching literacy in elementary classrooms and what helps to shape their conceptions of technology
integration for future practice.

**Partial Immersion Approach to Technology Integration**

The literacy education methods coursework is taken together, all during one semester in students’ junior year. During the 3-course literacy block numerous opportunities for modeling, exploration, and application were given to the pre-service teachers for both instructional and assessment purposes. Students explored various web sites and applications through classroom activities and assignments. The Substitution, Augmentation, Modification, Redefinition (SAMR) model is utilized throughout the design and implementation of the coursework. The premise is to outline the importance of redefining tasks to ensure students are not just being asked to substitute one outdated literacy practice for another simply by using technology (Puentedura, 2006). In order to design this kind of meaningful instruction, much time and consideration is given to the applications that should be shared and the assignments to demonstrate both proficiency in literacy teaching and technology integration.

The assignments were incorporated into the concurrent elementary field experience placements where the pre-service teachers provided a limited amount of instruction to children and used classroom experiences to implement class assignments in those field placement classrooms. A few of the class assignments included: 1) the creation of a content area video associated with a picture book using iMovie; 2) utilizing wix.com to create an interactive author study web page; 3) the development of a digitalized literacy instruction photo journal representing the gradual release of responsibility model; and 4) the culminating technology-focused action research inquiry projects. This approach was developed because of the need to include technology in pre-service teaching experience. Currently, no integrated technology or educational technology courses exist for students to take as education majors.
Class assignments and projects were integral to the immersion model; however, it was also imperative to use class time for students to play and explore web and tablet applications to understand their use and to begin thinking about their pedagogical implications. Examples of just a few of the web applications that were used during the semester include: 1) Arounder.com where students can take virtual field trips and build background knowledge related to children’s literature and informational books; 2) Popplet.com used for organizing thoughts and mind mapping; 3) Pixton.com, an online comic-making tool used as assessment of course concepts; 4) Shadow Puppet, a storytelling app used for creating short videos integrating art, literacy, and technology, and 5) Sock Poppets, an iPad app used to show how to help students creatively work on fluency. The above list is not exhaustive but illustrates a few of the ways in which pre-service teachers were exposed to different tools to expand on literacy objectives using technology.

Selection of Participants

All participants selected to participate in this study were former students enrolled in the literacy block courses. Three cohorts of pre-service teachers comprised the participants of this study, with ten to twelve students in each cohort. The first cohort was conducted as a pilot study. The total number of students included in this investigation was 44. The pre-service teachers were asked to participate in the investigation following their junior-year coursework. During the literacy methods block, each of the juniors take three 3-credit literacy courses: Teaching Reading in the Elementary School, Teaching Language Arts in the Elementary School, and Teaching Children’s Literature. The juniors are also simultaneously enrolled in a suburban field placement where they work with a cooperating teacher two mornings per week in a classroom. The suburban school where they are placed has wide access to digital tools including Smart Boards,
Chromebooks, iPads, and multiple computers for daily use in the classroom. The school has a one-to-one initiative so each of the students has access to their own device.

The pre-service teachers then enter their senior year, with a year-long placement in a large, urban school with a high poverty rate that coincides with all remaining methods coursework. In the fall semester they are in courses three days a week and in their placements for two full days. During the spring those seniors are solely in their placement classrooms. It is during the students’ senior year when they are asked to complete the questionnaire and take part in focus group interviews. This field placement is in stark contrast to the suburban placement from the previous year. Each classroom in the schools where they are placed has only two to four computers available and they are from the late 1990’s-early 2000’s. The only current technology consistently available in each of the classrooms is Promethean boards.

**Data Sources**

Consistent with qualitative research design, various methods of data collection are used in this study. Anecdotal records, artifact analysis, questionnaires and focus group interviews were the methods of data collection used. Anecdotal records taken during class sessions recorded observations of the pre-service teachers’ reactions, discussions and overall use of the technological tools. A baseline reflection was collected in the beginning of the semester that asked students their beliefs about the role of technology on literacy instruction. The pre-service teachers also had numerous opportunities in class to discuss and create a teaching vision to guide future practice. These vision statements were later analyzed to identify patterns about perceptions, experiences, and beliefs regarding teaching in the 21st century.

A questionnaire adapted from Schmidt, D., Baran, E., Thompson, A., Koehler, M.J., Shin, T, & Mishra, P. (2009) was distributed to each of the cohorts of students following their
first semester in their senior year. The questionnaire included survey items taken from Schmidt et al. (2009) to look for specific characteristics related to the TPACK framework that sought to understand the pre-service teachers’ experiences and perceptions about integrating pedagogy, content and technology. The questionnaire also included several open-ended questions to give the students an opportunity to elaborate on their ideas, insights and experiences. The questionnaire had 15 survey items using a Likert scale and five open-ended questions.

The focus group interviews captured a more thorough understanding of the artifact analysis and provided an in-depth discussion of the pre-service teachers’ perceptions of the role of technology in literacy instruction and assessment. Students who completed the survey were asked to participate in focus group interview. Five students from each cohort were randomly selected to participate in the focus group interviews. The focus group interviews were semi-structured, using the same 15 questions, with follow-up questions being asked when appropriate. The importance of the pre-service teachers’ beliefs and perceptions was an attempt to more profoundly understand the phenomenon being investigated.

Data Analysis

I analyzed the data with specific strategies and across multiple sources in an ongoing and systematic manner using content analysis (Taylor-Powell & Renner, 2003) to identify categories and patterns of how pre-service teachers perceive teaching in the 21st century and their conceptions of what that means. Assertions generated from across all data sources and findings, and interpretive commentary connected the assertions. Merriam (2002) described content analysis as analyzing interviews, field notes, and documents so that the researcher can seek to find themes and reoccurring patterns of meaning. Content analysis is also defined as a systematic, replicable technique for compressing words in text into fewer content categories,
Taylor-Powell and Renner (2003) defined the five steps of content analysis as follows: (1) Get to know your data, (2) Focus the analysis, (3) Categorize information, (4) Identify patterns and connections within and between categories, and (5) Interpretation— bringing it all together. The students’ systematic analysis of the quickwrites, classroom artifacts, anecdotal records, and vision statements helped to create patterns and then themes to generate findings associated with the investigation. Descriptive statistics were used for the survey items to analyze the pre-service teachers’ responses and look for patterns in their perceptions and feelings about teaching with technology. Focus group interviews were also recorded, transcribed, and analyzed. Creswell (2009) advocates the need validate the data. The data was triangulated using the analysis and comparison of multiple data sources including the artifact analysis, questionnaire analysis, and interview data. The multiple sources confirmed interpretive accuracy and helped to validate the themes. The evidence was collected and analyzed to understand whether experiences with technology helped to shape pre-service teachers’ conceptions of using technology to enhance literacy practices.

**Role of the Researcher**

Data collection took place throughout the semester with one course instructor. I am both the course instructor and the researcher in this study. The role of the qualitative researcher ranges on a continuum from a fully-present researcher and a co-participant, to a researcher who experiences the investigation, without being fully involved in the events around him or her (Rossman & Rallis, 2003). I had an active role in the study because I am the course instructor implementing the partial immersion approach to literacy instruction. I tried to extricate myself as the center of this work by collecting data following students’ coursework and by also allowing
them to speak freely about their experiences. Creswell (1998) suggests that the qualitative researcher often takes on the role of the active learner and tells a story from the participants’ point of view, rather than an expert passing judgment. The researcher’s role as an active learner is especially important in today’s literacy classrooms. Often, the researcher’s own knowledge, within the context of observation or study, constraints or broadens what he/she can observe, and, therefore, is in a position to explain and theorize (Steinkuehler, Black, & Clinton, 2005).

**Findings**

**Pilot Study Findings**

The first cohort of students served as the pilot study for this investigation. At this early point in the investigation the data collection only involved artifact analysis of the quickwrites, anecdotal records, and the students’ vision statements. The data mined from this analysis revealed not only important findings in a general sense, but also provided a foundation from which the exploration could be expanded. Three general themes emerged from the data that converged and helped to clarify the pre-service teachers’ perceptions. Those themes were: 1) New learning about technological tools were understood and assimilated; 2) Students had a perceived boost in confidence in using technological tools, and 3) The students’ perceived immersion approach as a contributor to their new learning and offered a means to incorporate technology into their future classrooms. Data analysis generated important considerations that led to a wider knowledge base about the pre-service teachers’ perceptions regarding the role of technology and its use in elementary classrooms.

First, the pre-service teachers felt the different modalities of technology integration offered them experience using tools they may not have explored on their own. Cervetti, Damico, and Pearson (2006) differentiate between new literacies, which typically involve new
technologies and multiple literacies that extend the many literacies beyond print. The pre-service teachers reported having experience with both kinds of literacies and that each helped shape their conception of how they can be used in an elementary classroom. For example, one pre-service teacher remarked, “The website ‘wix’ is a new favorite of mine. I could find multiple ways to bring this into the classroom. The students could make their own website about an author or about an historical event. I would also like to incorporate some kind of blog so the students can start learning to be professionals on the computer.” Another pre-service teacher discussed how to hopefully keep parents engaged in student learning by saying, “As a teacher I will utilize online bulletin boards, blogs, and webpages to keep parents involved in classroom lessons and events.”

The analysis revealed the pre-service teachers’ beliefs regarding the application of many of the web sites and technological tools. They shared the benefits, challenges and insights about how the tools could be used effectively.

The pre-service teachers also reported an increase in their confidence regarding the use of the tools and how they aided them in teaching literacy. One pre-service teacher remarked, “I feel good about integrating technology into my classroom because of having the chance to use it in our class and see it being used in the second grade classroom.” A pattern emerged through the analysis illustrating their desire to continue to use technological tools in future classrooms and to explore new applications to guide their literacy instructional practices.

Finally, the pre-service teachers discussed that the immersion in a technology- saturated classroom positively impacted their ability to engage the students in their field placements. At the beginning of the semester the pre-service teachers reported a minimalistic role on literacy instruction, assessment and student engagement. Following the literacy block the pre-service teachers reported that technology has a significant role on their ability to teach literacy, engage
students and assess content knowledge in meaningful ways. For example, one student suggested, “Making movies on the computer makes information more personal, interesting, and funny... it draws the students’ interest more.” Another suggested that, “E-books have the potential to change the way our students read and consume texts.” Someone said that, “I would want to use technology in my classroom because I firmly believe it can impact a students learning more than worksheets and posters.” The pre-service students’ comments helped to illustrate their own learning about technology, perceived confidence in utilizing technology, and their belief that the experience in the courses contributed to their learning about not only literacy practices but ways to incorporate technology into elementary classrooms to enhance literacy practices.

**Findings from Larger Study**

The larger study offered an opportunity to expand on the findings from the pilot study and understand the students’ perceptions more profoundly outside of just their junior block experience. The questionnaires and focus group interviews took place during their senior year, while they were in a different school environment, with different cooperating teachers, and had new methods instructors. The same three themes emerged, but the students offered rich and sometimes divergent perspectives related to the identified themes. New themes generated new insights and contributed to the larger study and helped to clarify the students’ perceptions, regarding the preparation of future teachers using technology. The themes presented below that expand and enhance the previous findings are: 1) New learning about tools and technology is not always transferable, 2) Pre-service teachers’ perceived confidence was contingent on applicable technological practices, 3) Literacy block learning helped provide essential T-PACK experiences, 4) Limited access prohibits meaningful student technology integration, and 5) University practices did not mirror expectations for elementary students. The themes illustrate
the patterns that emerged from the pilot study and were broadened during the larger study.

**New learning about tools and technology is not always transferable.** The first major understanding that the students shared was the disconnect between what they learned the previous year and what they had anticipated using in their senior-year placements and beyond. They quickly realized that some of that new learning about technology was how *not* to use it.

One of the more insightful perspectives was that teaching with technology does not automatically mean the learning will be better and the artifacts will be meaningful. The teachers as the suburban school used technology much differently than those at the urban schools. The students identified that technology-use was more meaningful. They discussed the student artifacts as the focus and how those artifacts were entrenched in some kind of literacy practice. Yet, their current placements in the urban school illustrated that the focus of technology integration is linked to programs that are purchased by the district and sometimes have no purpose other than to be an “add-on.” They are also sometimes just linked to the basal program the district is using. Jaime mentioned, “We use programs like Reading Eggs... but it doesn’t get linked to anything else we do” where Donna said, “We put on videos and then just move on to something else.” They understood enough about how technology should be used in classrooms that they are concerned about the issues they are seeing. Felicia remarked, “Throwing students on centers on the computers because the school paid for it doesn’t make it meaningful.” They noticed that the learning from their previous year could not be used in the classrooms where they are currently placed. They cannot use sites like arounder.com or powtoons.com because their cooperating teachers do not have knowledge or comfort using these tools.

The one tool that was not demonstrated or used over the course of the literacy block was a Promethean Board. They had to jump in and learn how they are used once arriving at their
placements. The students discussed their concern for how the board technologies are being used in their senior-year placements. One student shared, “We use the Promethean Boards but there are so many other things we can probably do that would be meaningful and make it more engaging.” They have major concerns about what the other students are doing when only one student is at the Promethean Board and the others are at their seats. They discussed that teachers should be providing meaningful ways of interacting with the content. Ideas shared were whiteboards, magnetic letters and trays, and other tools that students could be manipulating at their seats while the one student is manipulating the Promethean Board. One of the major findings is that the learning that took place during their junior year was not yet applicable during their senior year; however, they all had enough learning to know what they are seeing is not an effective use of technology integration and they instead are trying to create ways and ideas to make the technology more meaningful for students.

Pre-service teachers’ perceived confidence was contingent on applicable technological practices. Although the pre-service teachers in the pilot study found a perceived confidence boost, the findings from the larger study are similar but with the caveat that their confidence hinges on the belief that they have relevant technological knowledge. The questionnaire asked the pre-service students to use a Likert 5-point scale to rate their perceived confidence using the following statement: I have an increased confidence to use technology following the LLED course block. The mean score of the participants was a 4.25. They felt much less confident is being able to provide leadership to others related to technology integration. The mean score for the following statement was only a 3.17: I can provide leadership in helping others to coordinate the use of content, technologies, and teaching approaches in their teaching.

They realized that what was learned in their literacy block was only a small portion of the
tools and resources that can be incorporated into classrooms and they want to make sure they have the most current, relevant knowledge possible in their future careers. Stella shared, “If I am in a school that does not provide me with PD with the technology they use I don’t know how confident I will be.” Felicia followed that by saying, “Last year I felt confident but this year I am a bit doubtful of my own abilities because the only experience we had with technology was in our literacy courses.” Fortunately, Laura had a number of technology-rich experiences in her field placements and said, “I feel confident because I have seen so many different things being done in different placements. I have a number or experiences to draw from.” They all felt that they had knowledge and expertise they could draw from, but felt as though their experiences during senior year focused on a programmatic connection and did not help them increase their understandings. It is through their own knowledge and the disconnect they see that they realize the importance of focused professional development relative to how technology will be used in the districts where they will be teaching.

Literacy block learning helped provide essential T-PACK experiences. The pre-service teachers remarked about their experience in the literacy block and believed it was helpful to them in order to think about how and what ways technology could be integrated into elementary literacy instruction and assessment. For example, Talia remarked, “Before I thought technology hinders education more than it enhances, but now I think that meaningful uses with technology can help make instruction more focused.” The pre-service teachers spoke specifically about the assignments they had to complete for class such as the iMovie and the technology inquiry project. They also discussed the applications that were used in class like sock puppets, shadow puppets, and blendspace, and described the activities in detail, explaining how it illustrated meaningful literacy applications. The questionnaire also revealed their perceptions
about the literacy block and illustrated that the pre-service teachers valued their experience in their literacy block courses relative to the integration of technology. It allowed the students to be exposed to different ways of using technology and it allowed them time to explore different approaches.

**Limited access prohibits meaningful student technology integration.** Access continues to be a primary issue for meaningful technology integration, and it is exemplified through the words of the pre-service teachers in this study. Access to resources, professional development and time were the three issues discussed by the students. The need for continued professional development was discussed during the focus group interviews. They specifically talked about the importance of professional development related to meaningful technology integration. They saw the program and basal program focus and describe the need for districts to provide meaningful professional development for teachers to enhance learning with technology.

One of the survey items asked the participants to select their view of technology integration. The item chosen by over 85% of the participants was, “Collaboration is essential.” The only way to make this possible is to provide teachers time to collaborate. Many of the pre-service teachers expanded on this during the interviews saying how limited their collaboration time is and that technology does not seem to be a district focus and therefore there is no time for collaborative conversations among grade levels about this topic.

Time is essential, as are resources. With budget cuts both of these things are harder to ascertain but the pre-service teachers noted the importance of having access to these things. Stella shared, “I think about the inquiry project I did last year with blogging... I would never be able to do that in my current placement because they only have 6 laptops available.” Laura also iterated, “We had the space to do the inquiry projects... we had opportunity, guidance, feedback
and time.” The time and the resources are integral to being able to try anything and take risks with something new. Technology integration is new for everyone, seeing as it is continually changing. Time and resources need to be offered to teachers and pre-service teachers in order for them to experiment with current technology. The pre-service teachers recognize this and having access to resources, professional development and time as essential.

**University practices did not mirror expectations for elementary students.** One of the research questions of this study relates to pre-service teachers’ perceptions regarding the incongruities between technology integration at the university level versus technology integration in elementary classrooms. I would be remiss as a researcher if I was not interested in what teacher educators can do differently to help prepare pre-service teachers for teaching in elementary classrooms. Several ideas were shared that are worth communicating as part of the findings from this study. First, the students discussed a mismatch between what and how pre-service teachers are expected to teach and what they are being taught. For instance, the university currently has a MacBook requirement for education majors (that is currently being revised). The students often find that they are being asked to use technology and find ways of incorporating it into elementary classrooms, yet university faculty are still asking them to put their technology away in the classrooms instead of teaching them how to use it appropriately during lectures and classroom activities. Similarly, students need time to put it all together. They need to process how technology is being used (and not used) in classrooms and time to share that information with each other. University faculty should provide time for them to share and problem solve regarding what they are seeing and offer tools to allow them to feel more equipped to face the challenges they are confronting.

An important consideration Laura raised is that both university faculty and teachers/pre-
service teachers have an assumption that just because students grew up with technology they know how to use it. While is it a common understanding that these groups of students were raised with technology, they are not shown how to use technology in meaningful ways and to enhance learning. That becomes the job of the teacher educators and for future teachers to model and provide experiences with tools that will enhance learning. Finally, instructors teach with many different digital tools, websites and applications in decontextualized situations different from a typical classroom setting and often miss more simplistic, practical applications. For instance, it was realized that the pre-service teachers know how to work with fluency apps, create iMovies and websites, and yet they never learned skills they need on a more immediate basis, like how to create flipcharts on Promethean Boards and how to analyze data using Excel spreadsheets. An assumption was made about what students knew and could do and unfortunately a needed skill set was missed.

**Limitations**

Several limitations exist in this work that should be discussed. The small number of participants and the relatively short time period for interview periods might be considered limitations; however, they suited the limited scope of this investigation and the chosen methodology. If continued, this study will have more information to share about the pre-service teachers following graduation when they are in their own classrooms.

Additionally, a major limitation of this study is my role in the study and my own bias toward a technology-immersion approach to teaching literacy education courses. I am apt to believe the students would gain something from being part of the literacy block coursework and I have the ability to tune into their voices and understand them as future teachers. My use of codes and my method of data analysis allowed me to reduce any of my own previous biases and
allowed me to be able to drill down to a deep level of understanding.

A final limitation is my own knowledge base and expertise about technology and integrating technology. Although I stay as current as possible, technology is continually changing and I can only know a finite amount of information relative to how to integrate technology effectively. I do not know whether what I have deemed the most appropriate or relevant means of integrating technology is the most effective, although I continue to reflect on my practices, survey students, and change my approaches to reflect the students whom I teach.

Conclusion

This study is important to literacy educators because it identifies a growing area of research due to changes in modes and resources related to technology. Given modeling, a chance for exploration, opportunities for application and a means to demonstrate their growing knowledge of literacy methods through technological approaches, pre-service teachers are able to identify the importance of their role in delivering literacy instruction utilizing technological mediums. Through communication and dialogue occurring between groups of pre-service teachers they gleaned important insight, shared relevant challenges for technology integration and described how to make it meaningful. This work illustrates how immersion in technology-based literacy education can prepare elementary teachers for the changing climate of schools. It is equally important to researchers and literacy teacher educators to illustrate how using technology can help provide experience, opportunity, confidence and a means to engage students.
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Preservice Teachers’ Interpretation of the Equals Sign as Multiliteracies

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Abstract
This paper explores multiliteracies of two preservice teachers with respect to a mathematical symbol, the equals sign. Mathematics education research has placed great importance on the development of relational conceptions of the equals sign, while educational standards also emphasize contextual awareness in reading and literacy. We explore interview findings from a larger study related to preservice elementary teachers’ context-dependent, multiliterate reading practices of social media and formal mathematical texts. Analysis of interview transcripts suggest the importance of integrating concept development and multiliterate reading goals. The equals sign represents one among many examples of symbols that are or may be re-purposed in novel situations. The multiliterate use of the equals sign presents a microcosm of opportunities and challenges for content area teachers and students.

*Keywords*: equals sign; mathematics literacy; multiliteracies; operations; teacher education
Recent education reform efforts such as the Every Student Succeeds Act and Common Core State Standards Initiative call for an interconnection of ideas that engage students in skills that will help them become college and career ready and literate across disciplines, with special emphasis on math and literacy. The Common Core State Standards (CCSS) present student literacies as the abilities to read, write, listen, and use language to “respond to the varying demands of audience, task, purpose, and discipline” and to “come to understand other perspectives and cultures” (National Governors Assoc., 2010). The math standards are replete with expectations that students recognize and represent equivalence as a fundamental skill and prerequisite for manipulating fractions, algebraic thinking, and geometric problem solving. The competencies highlighted in the Standards depend, with few exceptions, on flexible conceptions of sameness, equivalence, comparison, and multiple equivalent representations. This orientation toward context-dependent interpretation is important. The blending of symbols, expressions, and thinking from formal to informal uses and from school to non-school contexts is a feature of 21st century life in an era in which writing has become a dominant form of mass literacy (Brandt, 2014). Signs and texts are always up for grabs, ready to be carried into new contexts.

A multiliterate view of mathematical language may help resolve emerging challenges facing mathematical literacy. In this paper, we bring a multiliteracies perspective to the task of analyzing ways of using and interpreting a ubiquitous symbol—the equals sign (=). We regard the equals sign (=) as a crucial context for developing mathematical thinking and as a microcosm of the domain of words and symbols used in various ways in mathematics and in a wide variety of ways outside explicitly mathematical settings. We believe that competent engagement in work, civic, and social activities requires that people make sense of the varied ways in which specialized signs are used in and across particular contexts. We also believe that successful
navigation of multiple intersecting languages is the rule rather than the exception for adults and children as the rise of writing as a form of mass literacy intensifies and democratizes evolutionary processes shaping language.

As we consider the development of specialized mathematical understanding for academic and other purposes, we focus on the understandings and interpretations of the equals sign produced by two preservice elementary teachers (PSTs). Elementary teachers typically teach multiple subjects and are thus positioned to help students learn to navigate multiple intersecting academic and nonacademic languages. The diverse contextual possibilities for symbols such as the = underline the importance of guiding children’s appropriation of meaning-making tools.

**Purpose of the Study**

Existing literature in mathematics education does not represent this multiliteracies perspective and, instead, places an inadequate détente or limit on “contextual understanding” regarding multiliteracies, and perhaps much else, if out-of-school expressions of signs and symbols remain out of view. The tendency is to focus on children’s orthodox use of =, a somewhat anachronistic view given the ubiquity of = in mass writing in social media and advertising. Some researchers have acknowledged that there is more complexity to the issue of how students view signs and text, attending to more detailed distinctions between students’ knowledge and use of different representational types (Baroody & Ginsburg, 1983; Jones & Pratt, 2012; Matthews, Rittle-Johnson, McEldoon, & Taylor, 2012). In this paper we argue that conflict between disciplinary norms and transdisciplinary educational goals can be resolved through a multiliterate view of mathematical problem solving. Specifically, we are interested in how = is used and interpreted contextually in settings ranging from school classrooms to advertising and social media. We contextualize interpretations of = as features of “stratified, socio-ideological
languages” (Bakhtin, 1986, p. 196) in which speakers communicate by drawing on prior situated uses of signs and symbols. Reading and writing = manifests ever-present and competing tendencies toward unitary or orthodox meaning and heteroglossic or multi-voiced divergence (Bakhtin, 1981).

Previous mathematics education literature focused on orthodoxy: Ways of using and understanding = generally are related as hierarchies of the kinds of thinking that underpin more and less successful interpretation of school-based mathematical tasks. In particular, researchers have contrasted operational versus relational views of the equals sign: A superior, relational view entails interpreting the expressions on both sides of = as mathematically equivalent. An inferior, operational view, by contrast, involves viewing = as one-directional, or as an instruction to perform the operation indicated on the left side and to write the answer on the right side (Baroody & Ginsburg, 1983; Jacobs et al., 2007; Kieran, 1981; McLean, 1964). Students’ mathematical development motivates concern over the prevalence of the inferior operational view of = among school children (Falkner, Levi, & Carpenter, 1999; Kieran, 1981; Knuth, Stephens, McNeil, &Alibali, 2006) compared with a more sophisticated relational view that correlates with success in solving algebraic equations (Knuth et al., 2006). In this paper, we argue that such a blinkered view is unrealistic and inappropriate given the broader cultural contexts that students (as well as teachers and others) inhabit. The fact is that literate adults read and write = in varied and situated ways. Instruction, therefore, should recognize these varied ways and focus on helping students attend to contextual clues, so that they become better equipped to use and interpret = appropriately, depending on the context.
Theoretical Perspective

A theory of multiliteracy informs this research by focusing attention on a paradigm shift, pedagogically, from inculcating standard forms of expression to promoting flexible, adaptive reading and writing practices (New London Group, 1996). The following anecdote from a mathematics education course for PSTs illustrates how we view writing and reading = as a feature of contemporary life characterized by intersecting social languages (Bakhtin, 1981). During an activity in which PSTs made sequences of computations with the goal of obtaining a target number, Carol (pseudonym) had used the numbers 7, 3, 10, 1, and 8 to obtain her target number of 2. Presenting her work to the class, Carol used the following written notation to complement mental computations and verbal account of problem solving: \(7 \times 3 = 21 - 11 = 10 - 8 = 2\). Following the suggestion of another PST in the class, Carol also wrote the equation \([(7 \times 3) - (10 + 1) - 8 = 2]\) to record her work. Carol’s first inscription reinforced the story of narrated calculations. The story was composed via multiple complementary modes as an ephemeral mathematical performance legible to her audience in its multimodal totality. Her second inscription seemed to serve a different purpose: It represented the set of computations as an orthodox formal expression—an equation—that was mathematically true independent of any other narrative. Students in the class seemed to readily understand both presentations. The first version had the advantage of emphasizing the sequence of computational steps performed, while the second version represented fit with understood norms of formally structured equations and revealed a detail that was not apparent in the first version (i.e., that the 11 had come from \(10 + 1\)).

The two presentations fit socio-mathematical languages with quite different norms. In both cases, Carol designed information to evoke particular responses from her audience by
drawing liberally on shared repertoires of semiotic tools that listeners could ostensibly recruit effectively with the guidance she provided. Those interpreting Carol’s statements indicated they understood Carol’s inscriptions contextually and were aware that Carol was free to communicate via ephemeral, heterodox mathematical expressions, yet capable of expressing herself within the limits of orthodoxy. Most importantly for our study, Carol and her peers seemed to understand implicitly that these expressive and interpretive capacities could at least coexist without diminishing one’s capacity to access higher status formal mathematics language. Peers interpreted the meaning of the equals signs based on the context of its use in each completed statement, and they flexibly accepted the speaker’s use of multiple, intersecting languages. The languages intersect in several places, especially in their use of $=$, where both Carol and her peers were able to generate meaning about an act of mathematical thinking for the sign effectively while preserving the distinctiveness of the sociolinguistic contexts in which it appeared.

A multiliterate treatment of the use of $=$ depends on recognition of interplay among audience, sign, and speaker. For the Russian sociolinguist Bakhtin (1981), whose work substantially influences research in multiliteracies, all three components of this triad are subject to dialogic histories shaping audience’s meaning making repertoires, sign’s meaning potential in relation to past uses, and speakers’ plans in relation to these evolving histories. In this view, reading and writing become social negotiations or transactions that reach backward in time to access certain meaning possibilities as they reach forward in anticipation of audience response.

- Expressions perceived as containing mathematical language, whether explanations or “problems” per se, seek to elicit particular responses from audiences. Some utterances are more restrictive in terms of their expected response.
- Mathematical problem solving and thinking exist in response to prior expressions.
• Mathematical symbols have meaning potential linked, but not restricted, to former uses.

In our experience, examples like the anecdote above occur frequently—not only in courses for PSTs, but in various school and non-school contexts. We believe such episodes can be understood from a perspective of multiliteracies (New London Group, 1996), in which readers and composers navigate multiple languages and forms of expression.

As seen in the anecdote, multiliterate approaches to mathematical expressions draw attention to genre as a way of understanding possibilities for making meaning through the use of mathematical symbols—particularly when math education is seen as one community among many with access to mathematical signs. There are genres, that is, standard and conventional ways of using words and symbols within the mathematical community that are endorsed by textbooks, academic journals, and established mathematical websites and authorities. At the same time, people readily write, read, and speak many of these words and symbols elsewhere, following other genre rules with varying degrees of adherence to ‘original’ formal uses. Examples of varied ways of using = appear in statements such as “Dave = awesome” and “Bad week + shoe shopping = regret” and “mail + box = mailbox.” The equals sign has been exported from both informal and formal contexts in these examples, dragging its genre-based prior meanings with it into new contexts that become part of its future meaning potential. If readers of this article can make sense of such statements, then they too participate in multiliterate interpretations of = as mathematical language is appropriated for new social purposes.

Background

There is a history of mathematics education research concerning students’ understanding of the equals sign focusing on the contrast between operational and relational views. Researchers have documented the prevalence of the relational view of the equals sign among school children
(Falkner et al., 1999; Kieran, 1981; Knuth et al., 2006). For example, Falkner and colleagues (1999) found that no more than 10% of the students in Grades 1–6 correctly solved $8 + 4 = \square + 5$. Knuth and colleagues (2006) found that fewer than half of students in Grades 6, 7, and 8 showed evidence of relational views of $=$.

Saenz-Ludlow and Walgamuth (1998) studied how third graders’ views of $=$ evolved from operational to relational during a teaching experiment. They documented how students’ participation in class discussions and activities influenced their views as they adopted a language of sameness (e.g., reading $=$ as “is the same as”). Mann (2004) advocates activities involving a seesaw, or balance scale, to promote relational views of $=$. While, Molina and Ambrose (2008), following prior work in this area, suggest the use of true-false equations to engage students in discussions of the meaning of $=$ and to promote relational thinking.

Some authors have acknowledged that there is more complexity to the issue of how students view $=$. Baroody and Ginsburg (1983) acknowledged complexity in children’s understanding of $=$. They reported, “About half (44%) of the participants were inconsistent in evaluating exposed, a typical equation forms as sensible” (p. 206). In other words, children would sometimes invoke one view and sometimes invoke another. This finding suggests that different conceptions of $=$ coexist as communicative resources. Jones and Pratt (2012) found that students flexibly recruit relational and substitution meanings of $=$ to complete task associated with the creation of arithmetic puzzles. Matthews and colleagues (2012) took a step to expand the relational-operational hierarchy to accommodate flexible conceptions by introducing a construct map for knowledge of $=$, consisting of the following four levels: rigid operational (the lowest level), flexible operational, basic relational, and comparative relational (the highest level). This model builds on previous research concerning operational and relational views, while
attending to more detailed distinctions between students’ knowledge of $\equiv$. These flexible conceptions of $\equiv$ are unsurprising, considering the various ways in which the equals sign is used. As illustrated above, math education literature has begun to recognize that views of $\equiv$ are not necessarily mutually exclusive; however, the literature remains narrowly situated within the context of school mathematics. We propose an amendment of operational and relational views of $\equiv$ that takes into account sociolinguistic diversity in an age of mass writing. This view has implications for efforts to assess human understanding of words and symbols, since understanding and language use occurs in a variety of contexts. We consider how people who have ready access to relational views of $\equiv$ in explicitly mathematics-oriented discussions are using $\equiv$ in other stratified, socio-ideological languages. We consider the meanings they invoke to make sense of statements involving $\equiv$ as evidence of the multiliterate environments making demands of today’s active and engaged sensemakers.

**Method**

We planned an investigation to explore the way elementary two PSTs read the equals sign. Our investigation presented PSTs with an opportunity to describe how and whether they engage in multiliterate reading of the equals sign. The design involved conducting an interview with two PSTs to generate data about their processes of reading the equals sign-bearing expressions following the administration of a survey. The survey consisted of a collection of utterances extracted from social media and formal mathematical texts put $\equiv$ to work in a variety of ways. We do not report on survey results here, instead, we explain the nature of the survey as it served as a reference point for the interviews. The quasi-clinical design of this research challenged the two PSTs to re-situate utterances displaced from ‘native’ contexts, stripped of many clues that might guide how to read a particular statement. To successfully answer
interview questions, we anticipated that PSTs would have to re-situate the texts.

To generate data suggesting PSTs multiliterate reading practices, we asked

1. What multi-literate practices support PSTs interpretation of various statements involving =?

Below, we describe our specific methods of data generation and analysis related to this question.

The Survey

During Spring Semester 2015, we administered a survey to the PSTs who were enrolled in an elementary mathematics education course at a large, public university in the southeastern United States. The survey included 12 statements, consisting of two from each of the five most prominent categories identified in the Twitter data, together with two arithmetic equations. The 12 statements include:

1. one retweet = one vote
2. hair = mess
3. 500 - 199 = ___
4. fresh sheets = sound sleep
5. four wheeler + snow ice = fun
6. CIA = chillin' is awesome
7. today = epic
8. taking off makeup = least fav activity of the day
9. last 24 hours = 0 followers and 2 unfollowers
10. a perfect relationship = two people supporting each other and never giving up
11. $59.99 USD = $75.43 CAD
12. 8 x 3 = 6 x 4

For each of these 12 statements, participants were asked to translate the statement into their own
words and to describe what = meant in the context of the statement. They were also asked whether or not the way of using = was familiar to them and whether or not it made sense to them. Following these responses, participants were asked to look back over all 12 examples and to categorize them. They were free to categorize the statements however they wanted, based on similarities and differences that they noticed.

**Interviews**

A week after administering the survey, we conducted an interview to investigate PSTs’ processes of reading the equals sign. The interviewer invited two PSTs to reflect upon, confer about, and expand upon their questionnaire responses. The interviewer, a faculty member in Elementary Mathematics Education and the third author on this paper, was positioned as a representative of the mathematics education community and an outsider to the world of social media. He inquired specifically about the interviewee’s interpretations and descriptions of each of the statements on the survey. He also invited the interviewees to reflect on how they had noticed = being used in social media in their own experience.

The interview transcript (9,300 words) was analyzed to identify patterns in the interpretive practices participants used to make sense of statements involving equal signs drawn from a variety of settings, including formal mathematical expressions. We noted themes in participants’ responses indicative of interviewees’ reading and writing practices involving =.

**Findings and Discussion**

We focus on PSTs’ interpretations and processing of statements involving = identified from the interview responses centered on the survey they had completed the week before.
PSTs Process of Reading =

The interview provided an opportunity to explore PSTs multiliterate reading of =.

Themes emerging in the interview transcript identified patterns in PSTs elaborations on their reading of equal sign expressions in the somewhat constrained environment of the survey.

Themes, subthemes, and corresponding experts from the interviews are provided in Table 1 and these themes and subthemes are discussed in more detail below.

Table 1

Themes, Subthemes, and Exemplars from Follow-up Interview

<table>
<thead>
<tr>
<th>Elaborations on prior survey responses</th>
<th>Proposing alternative readings by real and potential audiences</th>
<th>Connecting to orthodox mathematical language</th>
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</thead>
<tbody>
<tr>
<td><strong>Elaborations</strong></td>
<td>“My mom might be okay with it. My grandpa, he’d want to…bring it back to math which is associated with the equal sign”</td>
<td>“It’s important for [children] to understand something is applicable in more than one way. It’s just another form of abstract thinking…. That might be something they need to think about.”</td>
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<tr>
<td><strong>Proposing alternative readings</strong></td>
<td>“They would be like, ‘You can’t use the equal sign. The equal sign is only for math.’”</td>
<td>“It’s asking them to take something they’ve seen used one way and find ways to correctly apply it to other situations and to do so accurately…. Ask them about it.”</td>
</tr>
<tr>
<td><strong>real and potential audiences</strong></td>
<td>“When I was really into Twitter…I thought it was the cool thing to use symbols and stuff.”</td>
<td>“This may help them understand that the equal sign can mean ‘the same as’.”</td>
</tr>
<tr>
<td><strong>themes and subthemes</strong></td>
<td></td>
<td>“I feel like if they were able to understand that it could mean that this is the same, then they might be able to think about whether [numbers or expressions] might equal each other.”</td>
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<tr>
<th>Reconstructions of context necessary for interpreting expressions</th>
<th>Situating equal sign expressions in time</th>
<th>Interpreting technical use of equal sign</th>
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</thead>
<tbody>
<tr>
<td><strong>Reconstructions</strong></td>
<td>“…in a specific amount of time …. It’s just like ‘hair equals mess.’ It’s not like a permanent thing.”</td>
<td>“it’s sort of more of a pictograph and not a word”</td>
</tr>
<tr>
<td><strong>of context necessary for interpreting expressions</strong></td>
<td>“Fresh sheets equals sound sleep. I said ‘leads to’.”</td>
<td>“using it in place of a lot of words”</td>
</tr>
<tr>
<td><strong>interpreting expressions</strong></td>
<td>“Yeah, you would have to look at the time stamp behind to see. If it was like ten in the morning, she probably slept well. But if it’s three in the afternoon she probably wants clean sheets.”</td>
<td>“wanting to do stuff as fast as you can”</td>
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<tr>
<th>Multiliterate composition practices</th>
<th>Situating expressions</th>
<th>Noting divergent meaning</th>
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<tbody>
<tr>
<td><strong>Multiliterate composition practices</strong></td>
<td>“I use it when I’m texting and I’m lazy and I’m being very informal”</td>
<td>“Either that, or [a person might intend ——], I’ve seen it like, ‘She slept well.’”</td>
</tr>
<tr>
<td><strong>situating expressions</strong></td>
<td>“No one would post that…. I would never post taking off my makeup was my least favorite part of the day.”</td>
<td>“It made sense, it’s just kind of a weird way to put it.”</td>
</tr>
<tr>
<td><strong>of equal sign</strong></td>
<td>“I know I’ve done it. It’s common. It’s just the common way to put something. The exact thing might not be what you always mean, but it’s similar.”</td>
<td>“the meaning of that one could probably be more confusing”</td>
</tr>
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</table>
Elaborations on Survey Responses

Interview questions prompted participants to describe in greater detail the responses they supplied in the survey. Transcript data presented numerous elaborations that went beyond conveying the meaning of $\text{=}$. One interviewee proposed a genre-based explanation, shifting the discussion from the meaning of the symbol to the social and symbolic contexts of its appropriate use.

Participant 1: I almost want to say the equals sign is a meme in and of itself because they’re just using this one image. Even though it’s not a photo, it’s still an image. It’s a sign, and they’re just using the sign to convey meaning without having to say it (Girl on the left shakes her head in agreement).

Interviewer: So, what kind of things have you noticed about how they’re using it?

Participant 1: Like in what way?

Interviewer: Are there consistent ways that you see people using it? Is it one way? Different ways?

Participant 1: Definitely like, I feel like it’s used in a lot of ways.

Participant 2: Yeah, they’re kind of using it in whatever suits their purpose like this makes or equals or sustains.

Participant 1: Or leads to. My day equals terrible…
Participant 2: Using it like was…

Participant 1: Yeah!

Participant 2: They’re using it in place of a lot of words.

Interviewer: Does that work? Like does it make sense?

[Both participants nod their heads]

Participants 1 & 2: Yeah, it makes sense.

Participant 1: I don’t know if that’s because the equals sign has so many definitions or if we’re just so used to seeing it because our day and age of Twitter.

PSTs based many such elaborations on their recognition of the context-appropriate, widespread use of $=$. These elaborations reflect their capacities to view $=$ as a flexible communicative tool whose meaning is negotiated among composers, readers, and contexts.

Proposing alternative readings by real and potential audiences. Along similar lines, participants specifically dramatized the act of reading expressions containing $=$ by describing how others might read, write, and respond to such expressions. Multiple explanations of these alternative reading experiences were proposed, with numerous factors from age to technological changes presented as reasons for emerging variety. Participants ability to shift from one reader position to another suggests an important foundational element of the multiliterate nature of reading $=$: Readers are aware that how one reads the equals sign “all depends on your family and your circumstances.”

Connecting to orthodox mathematical language. The ability to shift among possible reader positions as part of the act of reading $=$ in a variety of expressions drawn from formal mathematical and popular culture settings is related to participants’ awareness of a relation between “new literacies” and children’s development of flexible understanding of formal uses of
Participants expressed a sense of urgency and opportunity facing young readers who may encounter both formal and “new” uses of =. “It’s important for them to understand something is applicable in more than one way,” said one interview participant, “That might be something they need to think about.” Participants connected what we describe as multiliteracy with important developmental changes useful for mathematical thinking.

Reconstructions of Context Necessary for Interpreting Expressions

Much data generated by questions prompting interviewees to describe their definitions of = is comprised of reconstructions of context eliminated in the experiment process. Interviewee’s efforts to recover, imagine, and convey a context-driven interpretation of the expressions are important indicators of multiliterate flexibility that allows them to make sense of a variety of expressions. The transcript excerpt below exemplifies how PSTs employed a flexible repertoire of context-based possible readings to explain equal sign expressions:

Interviewer: So, how would you categorize this, number two hair=mess?
Particpant 1: I said “describing.”
Particpant 2: I said “sayings” because I’ve seen it on like shirts and stuff.
Interviewer: So that’s a specific saying?
Particpant 2: I think so. That’s like one of those things like “I can’t adult. Please don’t make me adult.” I’ve seen it on a couple of tank tops.
Interviewer: Okay, I haven’t heard that one. I get it, adult is a verb now.
Particpant 1: I can’t adult.
Interviewer: So you said, it was like describing?
Particpant 1: Mmm-hmm. So it’s like, table = hard [presses down on table]
Interviewer: So does that make sense?
Participant 2: Yeah, like if you ran into something like that and somebody said, “Ow!”
Participant 1: Yeah, like, door = ouch.
Participant 2: It’s like my mom’s stove top = hot and she’s like “No, no way”
[sarcastically]
Participant 1: Don’t touch the stove top.
Interviewer: So you’re not just saying that as a casual observation. It means something happened.
Participant 2: Yes, when you do that you’re kinda saying, “yeah I just stuck my hand on the stove top and burnt my self.”

The quasi-clinical setting of the survey and interview dramatizes the embodied, contextualized reading practices PSTs employ routinely.

**Situating equal sign expressions in time.** Just as in the early anecdote in which Carol used = in both temporal and extra-temporal ways, interview data includes numerous examples of participants reconstructing the temporal circumstances they deem necessary to logical interpretation of equal sign expressions. In some cases, they presented a plot or narrative of which = expression was a snapshot. In other cases, they used temporal situations to color the meaning of a generic expression such as hair = mess in ways that go beyond explaining the meaning to explaining why the statement was published in the first place.

**Interpreting technical use of equal sign.** One aspect of participants’ efforts to reconstruct the use of = involved awareness of the technical and linguistic affordances and constraints of the alphabetic and digital technologies at hypothetical speakers’ disposal. Participants described the location of = on cellular phones of a certain vintage. They also described the symbolic relationship of = to the alphabet. These technical explanations were not
prompted by the expressions themselves or the interviewer, but rather they emerged as participants explained why they did or did not use equal signs in one context or another.

**Multiliterate Composition Practice**

Throughout the interview, participants underlined their awareness of and access to multiliterate composition practices. For example, an interviewee contrasted social media communication, which they understand readily, with *their* composition practices on social media:

**Participant 1:** But if I read it, I know what it means or know what someone’s trying to say. But personally, I don’t feel like I use it a lot.

**Interviewer:** So does it go along with you with all the other abbreviations? Like, Idk?

**Participant 1:** Yeah, I would associate the equals sign with an abbreviation.

**Interviewer:** What about you?

**Participant 2:** Um, I am really anal about typing everything out on Facebook. I’m that person that uses a semicolon on Facebook. Um, I’ve done it more than once. But I use it when I’m texting and I’m lazy and I’m being very informal. I don’t want to text a long message so I’ll text my best friend and say “day=fail” and she’ll know that my day has sucked and that I want to talk about it but not right now.

**Interviewer:** I feel like I do it as kind of a joke now, because I’ve noticed these ways of people using it. Like with my friends, especially if I have talked to them about this then they’ll know.

**Participant 1:** I’ve, um, there’s been situations when like the “idk, my bff Jill, xoxo, ttyl” like I don’t do that, but I’ve done it.
Their awareness of multiple languages intersection and coexisting on social media and their ability to use = and other digital communication tools ironically underline the multiliterate nature of the reading practices they bring to the equals sign.

**Situating expressions.** Participants’ explanation of uses of = regularly resulted in their application of categories based on situation, following a pattern of “People do this” or “I do this when.” This awareness of situational categories even allowed participants to exclude possible meanings, as evidenced by one speaker’s conclusion, “No one would post that…. I would never post [that] taking off my makeup was my least favorite part of the day.” It is important to note that these authoritative expressions often dealt with fine-grained distinctions governing the propriety of certain interpretations. In other words, participants used experiential, situational categories to make specific determinations about the meaning of an equal sign expression.

**Participant 1:** For this one. Now that I’ve talked about it, I think it means something different than I put down. I think it means ‘overall,’ kind of. Like, because this happened and this happened, overall, I had a fun day.

**Participant 2:** People do this a lot with food, too. Like way more for food than anything else. I mostly use that for food.

**Interviewer:** How would you use it for food?

**Participant 2:** Something like, “mini-cake + chocolate milk = win.” Something like that.

Like, I have food, my food is good, be jealous of my food.

This transcript excerpt exemplifies interviewees’ ability to situate expressions presented in a list cut off from their original social media sources. In this case, Participant 1 took liberty to situate the expression in terms of its genre added that similar expressions were “more for food” than for
the purposes she attributed to the statement under consideration.

**Noting divergent meaning possibilities based on context.** Alongside the use of experiential categories to situate the meaning of equal sign expressions, participants noted divergent possibilities for meaning, at times based on depth of experience and at times based on lack of experience they viewed as relevant. “We don’t see snow in Florida” is offered as a reason for taking an agnostic position on an expression combining all-terrain vehicles and frozen bodies of water. In many cases, discussions of uncertainty included conclusive statements such as, “I think it always depended on the context,” and “There’s no way to be sure unless you had context.” Participants’ insistence that context is important both in the context of “readable” and unreadable statements is significant to our discussion of the role of multiliteracy in reading = and developing flexible, context-dependent understandings in mathematics education.

**Conclusion**

This study offers a nuanced view of meanings of = in multiple contexts and responds to expert calls to understand how text and textual representations, such as symbols, are used in different disciplines (Shanahan, Shanahan, & Misisichia, 2011). The two PSTs in this study interpreted = as a context-dependent communicative tool, while being aware of some of the symbol’s history and how that history and current writing practices intersect in particular social settings, times, and places. The variety of interpretations expressed by the PSTs point towards a multiliterate reading of = and aligns with the emphasis on contextualized meaning in recent educational reforms.

It is noteworthy that the statements that we presented in the survey could be categorized as distinctly operational or relational ways of using =. Previous research on conceptions of = has tended to focus on only students’ reading and disciplined production of orthodox mathematical
utterances related to these distinctions. Research in this area has largely been concerned with whether or not students correctly read within boundaries of an orthodox mathematical meaning of $=$ (i.e., relational view). We are concerned that such a view may result in a perceived need among teachers of “guarding the tower” of proper reading and writing (Shaughnessy, 1976, p. 234). In this study, we have taken a broader perspective, recognizing that $=$ occurs widely in a variety of ways in people’s multiliterate lives, a perspective that offers particular power to mathematics teacher educators.

From this perspective, it appears unproductive to view conceptions or ways of using $=$ as decidedly correct or incorrect. Furthermore, qualitative characterizations or models that specify levels of understanding focus narrowly on certain kinds of mathematical tasks at the exclusion of other relevant meanings of $=$ that PSTs (and other students) may draw upon. The implications for instruction that follow from a multiliteracies perspective suggest that teacher educators focus on helping PSTs to recognize situated meanings and to navigate contextually appropriate meaning. Rather than construing levels of understanding of $=$ as narrowly defined, research should instead distinguish students’ abilities to recognize various meanings and the appropriateness to the contexts in which they appear.

We do not claim that the two PSTs who participated in this research are representative of all U.S. PSTs. Nonetheless, our findings challenge the dichotomous presentation of human understanding of the meaning of equal sign prevalent in the extant corpus of research. We find that $=$ is used in many different ways in the world today and that PSTs are well adept at recognizing the multiple meanings of $=$. Indeed, this recognition positions PSTs to better understand their world, and it is pointless to deny the socio-ideological tensions among possible meanings of $=$. The advantages of the relational view notwithstanding, an anachronistic view of
= does not help children who must navigate a variety of other complicated socio-ideological language barriers, boundaries, traditions, and transitions. Our claim is that children are already navigating complicated socio-ideological language transitions, and that multiliteracy is a powerful asset, not a liability. We conclude that it behooves PSTs (as it does adults of varied vocations) to be able to arrive at sensible interpretations of = and explicit awareness of how it is used in different contexts so that they might provide students with guidance, rather than a “guarding the tower” (Shaughnessy, 1976, p. 234).
References


Redefining Literacy in the Digital Age

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Introduction

Learning requires the construction of meaning utilizing various metacognitive processes and self-regulation. Metacognition is key to helping students become proficient readers and high academic achievers (Wang, Haertel, & Walberg, 1993). Metacognitive readers are aware of their thinking and learning and are able to identify tasks, monitor performance, choose appropriate strategies, and solve problems. Metacognition is the intentional thinking process used to regulate learning. Some definitions of metacognition include self-regulation, others have it as a separate construct. For the purpose of this paper, the definition of metacognition includes both the learner’s awareness of his or her thinking and the self-regulation that occurs to accomplish a learning goal.

In the paper and pencil world, the construction of meaning may have included reading a single print text, multiple print texts, static images, and videos all presented separately. In this world, we know that "strong learners can explain which strategies they used to solve a problem and why, while less competent students monitor their own thinking sporadically and ineffectively and offer incomplete explanations" (Pellegrino & Hilton, 2012, p. 92). Thus, the strong learner is metacognitive and can both regulate and share his or her metacognitive processes.

When reading digitally, multiple texts are often presented within a single webpage, a learning module, and/or a search results page. Research has identified the manner in which texts are presented plays an influential role on student monitoring and regulation of understanding (Singer & Alexander, 2017; Wilson, Zygouris-Coe, & Cardullo, 2014) and that effective online research requires critical comprehension skills.
as students learn how to effectively engage in online research (Coiro, 2011; Leu et al., 2014). Current shifts in the medium of text and the strategies utilized for learning have changed what it means to be a learner in the age of digital texts. In our view, we also must reconsider the metacognitive processes learners use in today’s learning and teaching contexts. Yet, how do we begin to understand what learners do in order to construct meaning in the digital age?

This paper examined a methodological approach to uncovering the metacognitive processes learners used when they engaged in an educational task on an iPad. This research was significant because “what we don’t know outweighs what we do know about how people [students] comprehend text on a digital screen rather than on the printed paper” (Sawchuk, 2017) and schools have been adopting technology, including the iPad, without a full understanding of how these devices change the metacognitive processes needed for learning. Therefore, uncovering the metacognitive strategies used during learning can help teachers prepare students to critically engage with hypermedia text. The study of metacognition has often included two approaches, survey of metacognitive actions and on-line trace methodologies.

Readers’ metacognitive awareness and use of reading strategies have been examined using metacognitive inventories which are self-report instruments that ask readers to identify strategies used as they interact with text. The surveys are based on verbal protocols and prior knowledge of metacognitive and self-regulation processes. In these surveys respondents are often asked questions such as, “I have a purpose in mind when I read” (Mokhtari & Reichard, 2002). Although, these self-report instruments have a limited correlation to reading comprehension (Veenman, 2005) they do inform teachers
and researchers as to the participants’ thoughts regarding what actions they should take when learning.

Currently few instruments are available to measure learners’ metacognitive processes used during digital learning. Yet, the increased complexity of metacognition required in this environment means it is critical for identifying strategies used as students interact with digital text(s). The iPad Metacognitive Awareness of Reading Strategies Inventory (i-MARSI) (Cardullo, Wilson, & Zygouris-Coe, forthcoming), a self-report survey of metacognition when learning using an iPad, is a 39-item inventory used to assess the awareness and perceived use of reading strategies while reading and learning on an iPad. The i-MARSI uses a Likert-type scale, which ranges from 1 (I never or almost never do this) to 5 (I always or almost always do this). The consistency reliability coefficient for the two subscales Device-Supported Metacognitive Strategies (DSMS) .93 and Self-Monitoring Metacognitive Strategies (SMMS) 0.94 overall the i-MARSI has a .932 internal consistency reliability alpha coefficient for all items.

The second technique for understanding the metacognition used by learners includes online trace methodologies. These include, but are not limited to, video and audio recording, eye tracking, and think aloud protocols. Each of these techniques allows researchers a glimpse into the internal metacognitive processes that readers employ to create meaning. Think aloud protocols have learners share their thinking as they engage in a task. This helps to capture their understanding or reasons behind the actions taken to assess the metacognitive processes. Video recordings of learners’ actions can capture the actions and, when directed the learners’ think alouds. Whereas eye-movement tracking helps to assess where a reader’s eyes go during learning. Each of these processes attempt
to capture the metacognitive processes learners use, yet, no single technique captures the full extent of the metacognitive processes (Azevedo, Moos, Johnson, & Chauncey, 2010).

Although each aforementioned technique for understanding metacognitive processes has a different purpose and means by which to “capture” metacognition, they both offer critical insights to the field about the complexity of the topic and the need for continued research that will inform researchers and educators.

Methods

This study analyzed the phenomenon of engaging in an academic task using an iPad in a semi-controlled setting to generate an understanding of the metacognitive practices and strategies used. An academic task with an iPad is the act of constructing meaning using an iPad. The participants used an iPad to complete six unique tasks: 1) Access and use email using the Mail APP; 2) Complete two surveys (i-MARSI and background information survey) accessed through the Mail APP; 3) Access Google Docs to read directions; 4) View videos on photosynthesis using Khan Academy; 5) Write using Google Docs; 6) Share information generated using Google Docs.

The study utilized two methodological techniques a metacognitive survey and video observation. The i-MARSI, a metacognitive survey was chosen because it is the only survey that assesses students’ perceptions of the metacognitive tasks necessary for learning when using the iPad. In addition, online trace video observation was chosen because it allows the researcher to capture the actions the learner takes when engaging in the academic task when reading on an iPad. The videos were analyzed using a video observation protocol developed for the iPad. These two methods for assessing the metacognition of learners when using an iPad permitted the researchers to understand
both the perceived use of metacognitive strategies as well as the actual metacognitive processes used by learners.

The participants in the study were considered expert readers. An expert reader is an active, strategic reader who applies metacognitive strategies to construct meaning (Duffy, Roehler, Herrman, 1988; Ertmer & Newby, 1996; Shanahan, Shanahan, & Misischia, 2011). Each of the participants in the study had attained advanced degrees in science and/or education, their successful completion of advanced degrees indicated the ability to construct meaning and identified them as expert readers. Using convenience sampling (Glaser & Strauss, 1967), the researcher contacted expert science readers already known for this study. The contact was done through email informing them about the study and attaching the informed consent. Each participant had advanced degrees in science but differing levels of experience and expertise in iPad usage. Participant 1 never used an iPad or iPhone prior to the study. She is a science education professor with a Ph.D. with more than 20 years of experience at the college level. Participant 2 uses an iPhone and the iPad for some work-related tasks. She is currently working on a Ph.D. in science education. Participant 3: Uses and iPad and iPhone for work and pleasure and rates his knowledge at the highest levels and teaches a teacher education course that requires students to have and use an iPad.

The study sought to answer two research questions. (1) What metacognitive behaviors and literacy practices do expert readers engage in when using an iPad for the purpose of academic reading and writing in science? (2) Which factors (i.e., iPad, metacognitive behaviors, and literacy practices) result in expert readers’ metacognitive awareness of device supported and self-monitoring metacognitive strategies?
Using online trace video observation of the participants we were able to observe what metacognitive behaviors and literacy practices expert readers used as they engaged in academic reading and writing in science on the iPad. They actively engaged in a multi-step science learning task using an iPad. The task included checking email for directions, communicating about learning, reading on-line science texts, and watching science videos. As the expert reader completed the task, they were videotaped. To identify metacognitive behaviors and literacy practices we used constant comparison of the participants’ responses to the i-MARSI (Cardullo, Wilson, & Zygouris-Coe, 2015) and the observation protocol developed and refined for this study.

**Data Analysis**

The data was analyzed in three distinct steps. The first was the analysis of the i-MARSI data. Next was the video analysis. Finally, the i-MARSI data was compared to the video analysis.

**Analysis of the i-MARSI results**

The i-MARSI has two factors that assess metacognitive knowledge and judgement when engaging in academic tasks on the iPad. Factor 1 is composed of Device-Supported Metacognitive Strategies (DSMS), which can be thought of as supportive tools aimed at addressing ones’ metacognitive knowledge and judgements on how learning is supported when using an iPad. Examples include setting a purpose, looking at the accuracy of information, previewing text for content by scrolling, paying attention to text features (hyperlinks, bold, color or italicized text), making decisions in relation to what to read carefully or closely to enhance reading comprehension. Factor 2 is comprised of Self-Monitoring Metacognitive Strategies (SMMS). These include the
metacognitive judgements and possible self-regulation steps learners use when learning and using an iPad. Examples include taking notes electronically, using features of the iPad to listen to the text annotations, using discussion tools (chat, wikis, or blogs) to discuss text with others, using reference tools, electronic dictionary, adjust font size, using search feature to look for key terms and navigate through the electronic text using features in the e-book or i-Pad to support reading comprehension. Overall scores in each sub scale indicate how often one uses the given strategy when they read academic or school- related materials such as textbooks, library books, etc. using an iPad. The mean average for each subgroup shows which group of strategies are used more often or least often when reading on the iPad. And the overall mean average is used to identify the overall level of strategy usage.

**Analysis of the Video Observation data**

Throughout this research trace online video observations were transcribed using code time stamps. Coding was a defining component of this study. Thomas (2006) described five key features of codes. He explained that a category or a code needs an identifier, typically a short word or phrase. Codes were identified using short phrases that provided strong implications for the meaning of the codes. Each code had an operational definition that further defined the code. In the initial codebook, major themes were defined using operational definitions. The initial codebook (Figure 1) was developed using open coding. Holton (2007) stated open coding is a necessity as it allows all data to be interpreted allowing underlying themes to emerge. All transcriptions were evaluated by two or more researchers to enhance credibility and trustworthiness. Each transcription was analyzed and thoughts or ideas were divided into segments which were
then scrutinized for commonalities. Strauss and Corbin (1998) stated in order to identify the concepts one should “open up the text and expose the thoughts, ideas, and meanings contained therein” (p.102). Using multiple itineration’s, the second phase of coding looked at breaking down each segment, analyzing, comparing, labeling, and categorizing the data. Using the time stamped data, the individual units were analyzed and sorted using constant comparison. The video data were key to this process. By watching the videos from multiple perspectives, the actions of the participants provided a glimpse into the metacognitive processes that were being used during the learning process.

Figure 1. Initial Codebook.

<table>
<thead>
<tr>
<th>Major Theme/Code</th>
<th>Sub-Theme/Code</th>
<th>Major Theme/Code</th>
<th>Sub-Theme/Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device Supported Metacognitive Strategies</td>
<td>Scrolls up, down, left to right</td>
<td>Annotation</td>
<td>Underline</td>
</tr>
<tr>
<td></td>
<td>Combines information in multiple websites</td>
<td></td>
<td>Circles</td>
</tr>
<tr>
<td></td>
<td>Evaluates if content fits purpose</td>
<td></td>
<td>Comments</td>
</tr>
<tr>
<td></td>
<td>Skims text for length and organization</td>
<td></td>
<td>Highlights</td>
</tr>
<tr>
<td></td>
<td>Distracted by popups or advertisements</td>
<td></td>
<td>Other</td>
</tr>
<tr>
<td></td>
<td>Focused and ignores popups or advertisements</td>
<td></td>
<td>Other</td>
</tr>
<tr>
<td>Self-Monitoring Metacognitive Reading Strategies</td>
<td>Take notes electronically</td>
<td>Text Features</td>
<td>Tables</td>
</tr>
<tr>
<td></td>
<td>Take notes using paper and pencil</td>
<td></td>
<td>Figures</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td></td>
<td>Photos</td>
</tr>
<tr>
<td>Pays Attention to:</td>
<td>Bold</td>
<td>Navigation</td>
<td>Flips back and forth between: Text and Text</td>
</tr>
<tr>
<td></td>
<td>Italics</td>
<td></td>
<td>Flips back and forth between: Websites and Websites</td>
</tr>
</tbody>
</table>
During this process, we compared incidents or units of analysis. We continually sorted the data integrating categories. We identified nine themes and 44 codes during this phase. The themes that emerged were device supported strategies, self-monitoring strategies, navigation, annotation, text features, features of the device, attention to, task management, and task oriented. Multiple codes (44) emerged as well and we often felt codes were not mutually exclusive and they often overlapped considerably. For example, the task of notetaking and annotation overlapped. Taking notes using paper and a pen; scrolling up and down, skimming text for length and organization. Taking notes using paper and pen indicated monitoring of the learning process. Scrolling up and down could indicate searching for information, monitoring of learning, answering personal questions regarding the design of the page, etc. Skimming the text could indicate that the reader was setting a purpose for reading. Although, the reasons for these actions are assumed,
as the readers did not engage in the think aloud protocol, they do capture the actions that were completed in the process of learning.

In the third phase of coding the video data, axial coding reduced the number of codes. Our intent was to refine the codes and to show a relationship among the codes. During this process, we worked to reduce the data and combine pieces or units of information. During this iteration, the themes and codes were reduced to 3 themes and 13 codes (Figure 2). The three themes that emerged after sorting and reducing the number of codes using axial coding were (1) uses features of the iPad to construct meaning while accomplishing an academic task; (2) uses features of an app on an iPad to construct meaning while accomplishing an academic task; (3) evidence of problem solving. Throughout the analysis of the video data, notes were made in conjunction with the codes assigned about the task, the readers actions, and verbal comments were made to begin capturing the metacognitive processes used to learn with an iPad.

*Figure 2. Final Codes.*

<table>
<thead>
<tr>
<th>Uses iPad features to construct meaning while accomplishing an academic task</th>
<th>Uses features of an App on an iPad to construct meaning while accomplishing an academic task</th>
<th>Evidence of problem solving</th>
</tr>
</thead>
<tbody>
<tr>
<td>• scrolling</td>
<td>• annotate</td>
<td>• self-monitors or chooses a specific app or feature outside of task directions after recognizing a problem</td>
</tr>
<tr>
<td>• navigation (including switching between apps)</td>
<td>• electronic notes</td>
<td>• takes paper and pencil notes</td>
</tr>
<tr>
<td>• taking screenshots</td>
<td>• learning management software</td>
<td>• pauses between tasks indicating processing</td>
</tr>
<tr>
<td>• book marking</td>
<td>• presentation software</td>
<td></td>
</tr>
<tr>
<td>• other</td>
<td>• other</td>
<td></td>
</tr>
</tbody>
</table>

---
Comparing the Video Observation and i-MARSI data

The data from trace online video observation and the i-MARSI were compared using the constant comparative method for analysis to see if the actions of the participants matched the responses to the survey instrument. This comparison revealed that participants’ scores on the i-MARSI were higher than the actual coded data of their video-taped actions. It is important to note that one of the limitations of self report-type instruments is social desirability and at times inflated responses. Other possible reasons for this difference between the i-MARSI scores and the analysis of the video-taped participant actions is the researcher factors. Although a strong reliability was established in the identification of the codes, researcher bias and the human factor may also play a role.

Results

Participant 1 demonstrated strong knowledge of Device-Supported Metacognitive Strategies (mean average 4.0) and average knowledge of Self-Monitoring Metacognitive Strategies (mean average 2.7) on the i-MARSI however when applying knowledge to complete the task assigned she ran into multiple issues, including but not limited to application of strategies, navigation between applications, and use of a hyperlink. Since the iPad was new to her she responded to the questions on the i-MARSI with what she believed a learner should do when using the device.

Participant 2 also demonstrated strong knowledge of Device Supported Metacognitive Strategies (mean average 4.1) and low average of knowledge of Self-Monitoring Metacognitive Strategies (mean average 2.1) on the i-MARSI. When applying these skills to the task on the iPad, he used navigation strategies; but had issues
with some of the features. Participant 3 also demonstrated strong knowledge of Device Supported Metacognitive Strategies (mean average 4.3) and had a high average of knowledge of Self-Monitoring Metacognitive Strategies (mean average 3.8) on the i-MARSI. When applying these skills to the task on the iPad, she used features beyond the task to help construct meaning; but over relied on one technique throughout the meaning making process. Overall scores for all three participants are as follows: 3.3 participant one; 3.1 participant two; and 4.0 participant three, indicating participant one and two have an average overall score and participant three has a high overall score.

The results indicated there is a gap between the results on the i-MARSI and the actual regulation of these strategies during implementation as the participants constructed meaning using the iPad. During the construction of meaning, it was clear that the learners’ metacognition, self-regulation, and epistemology toward both the iPad and the task affected the participants’ learning. Participant 1 did not have self-regulation or problem solving strategies on the iPad; but while watching the videos or reading the text required of the task, she continually evaluated the content and addressed the ideas presented with confirming movements or comments. She did not get very far in the task due to problems that arose in the navigation and operation of the iPad. Despite her lack of metacognition and self-regulation with the iPad, the fact that she had the epistemic belief that she could learn on the iPad and engaged metacognitively with the content of the task, there is some evidence of learning.

Participant 2 was strategic in the use of the iPad and regarding the task to produce learning. When engaging with the iPad, he was able to tap, scroll, and navigate between tasks while also taking notes using Google docs to record his learning. His use of the
iPad demonstrated that his score on the i-MARSI for DSMS did not match what was observed in the video as he had difficulty with some of the features of the iPad. When engaging with the content of the task, he also made comments and movements that demonstrated evaluation of the content while commenting on the ideas presented as being factual. This participant demonstrated metacognition, self-regulation, and an epistemic belief towards learning regarding both the iPad and the task. He completed more of the task than participant 1 and demonstrated learning of the content.

Participant 3 exhibited strong strategic actions with the iPad, she took screen shots of text, scrolled during the videos to see the text of the video and easily navigated between Applications. However, she did not spend more than 15 seconds focused on a video. Thus, illustrating a mismatch between the Self-Monitoring Metacognitive Strategies identified on the i-MARSI and the actions taken by the participant. She did not monitor each task for learning. When completing the final task, a quiz, she continually commented on how she should have taken more screen shots because she couldn’t find the answers to the questions. So, in spite of her high level of skill with the iPad, she lacked metacognition, self-regulation, and the epistemic beliefs to learn the content of the task. Thus, her engagement in the task did not lead to learning.

**Challenges**

Throughout the process of this exploratory study many challenges were encountered, both during the data collection and analysis.

**Challenges during the data collection**

The challenges during data collection relate to both the task and the instructions provided to the participants. Regarding the task, for the purpose of the study the task was
a Khan Academy module on photosynthesis. The module was chosen because it fulfilled the requirement of being a focus of each participant’s content area specialty and when reviewing the videos and tasks the module should take about 40 minutes. However, the task did not have any hyperlinks, a key feature of on-line learning, nor did the task take the time calculated. The lack of hyperlinks was a problem because they are an integral part of many websites and online texts that are used for academic learning. Furthermore, research demonstrates that when students have static metacognitive behaviors when engaging in hypermedia learning environments learning is negatively affected (Tuysuzoglu & Greene, 2015). The time of the task was an issue because the participants were only asked to give 1 hour of their time. The time of the task actually took an hour and thirty minutes. Participants did not schedule the full amount of time, to complete the task. Therefore, participants 1 and 2 did not have time to fully complete the task. Thus, it was impossible for any of the participants to completely finish the task. Furthermore, it was a goal of the study to collect some retrospective think aloud data from the participants regarding the reasons behind their actions.

The instructions for the task were also a complication of the study. The instructions for the task were originally mostly on the iPad. The written instructions told the participants to go to the mail app and to access the Google Docs document with further instructions, including links to the survey and the Khan Academy, link and access instructions. This led to a lot of moving back and forth within the iPad that did not lead to task accomplishment. Participant 1 and 2 had to search for the Google Docs application repeatedly throughout the study. Participant 3 solved the issue by taking screen shots of the directions and referring to them in the Photos App, thus illustrating a
device supported strategy. Thus, the format of the directions caused difficulties for the participants. These difficulties did inform us as to the participants’ knowledge of the iPad functions, as well as, how the navigation between applications affects learning on the iPad. Furthermore, the instructions did not ask the participants to engage in think alouds when engaging in the task. This led to challenges during the data analysis.

**Challenges during data analysis**

The lack of think alouds collected during the study forced the analysis of the video to be limited to informal comments made by the participants and viewable actions. This was a problem because it was difficult to determine the purpose of the actions taken by the participants. For instance, was the action of navigating back to the Google Doc with directions, self-monitoring of task completion, engagement in the task (responding to a question in the Google Doc or reviewing the Google Doc question), or construction of meaning regarding the purpose of the task.

Another challenge that arose during data collection dealt with coding. The original code book was based off the questions of the iMARSI, the focus on the iMARSI was a good starting point but limited the coding process. The coding taught us that in future research we need to delineate between macro/micro metacognitive processes. Macro processes are items such as planning and monitoring. A microprocess under planning, would be the articulation of a sub-goal or restating a goal. A microprocess under monitoring includes content evaluation and the feeling of knowing (Tuysuzoglu & Greene, 2015). Future codes need to delineate between the use of the iPad features for problem solving and the learner’s actions/thinking around problem solving. This is important because the problem solving around the device, applications, etc. are separate
from the problem solving around learning. In fact, the metacognitive problem solving used when negotiating the iPad, Applications, and/or computer programs are key to helping students become learners in the digital age. The final issue that arose during the coding came about with the operational definition of metacognition. Throughout the study metacognition did not include the epistemic beliefs of the participants. The data hinted that epistemic cognition may affect metacognition during a prescribed learning task. Hofer (2004) identified the effect of epistemic cognition on metacognition, as a learners’ beliefs about knowing, about the self as knower, the nature of knowledge, and the reasons for knowing all play a role in how the learner thinks about her learning and thus effecting her metacognition. In this research, the third participant completed each task of the study, however, she consistently referred to screen shots for information. From these actions, it can be inferred that she was not interested in learning the information but was interested in completing the task.

**Next Steps**

This study was the first step in examining the actions expert adult learners take when engaged in an academic task using an iPad. The study addressed a need in the literature to learn more about how learners engage with digital devices to read and comprehend. Next research steps include the following: (a) revise the academic task to include hyperlinks and written directions; (b) expand the operational definitions to include both the macro and micro processes of metacognition.; (c) expand the online trace methodologies to include think alouds; and, (d) develop a survey of the participants’ epistemic beliefs and possibly one of their self-efficacy regarding the topic, the device,
and the task to assure that all variables that could affect the metacognition are accounted for.

Comprehension and metacognition are complex, abstract processes. Metacognition refers (a) to a learner’s awareness and control of cognitive processes as it relates to tasks or to other people and (b) the monitoring of cognitive processes and the ability to regulate cognition through the use of strategies to repair comprehension when meaning drops. The complexity of reading and comprehending digital texts in digital environments calls for further exploration of the processes involved. Identifying ways to gauge learners’ needs as they engage in academic tasks using an iPad may inform educators about how to instruct and assist students to critically engage with hypermedia text.
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Abstract

The Next Generation Science Standards and the Common Core State Standards for English Language Arts suggest that students need to be prepared for a specialize yet connected world by engaging in and developing understanding of disciplinary practices. This study explored how students make sense of and contextualize their understanding of science concepts in self-created tradebooks, specifically in the genre of comic books. We asked middle school students in an integrated International Bachelorette Comic Book Design class to produce a short comic book story that shared a concept from their favorite class in an engaging and entertaining way. We examine the work of three students who choose to incorporate science concepts into their comic book stories and use these findings to help inform our future work related to disciplinary practices across science and language arts.

Keywords: tradebooks; comic books; science education; literacy
The Next Generation Science Standards (NGSS) and the Common Core State Standards (CCSS) for English Language Arts (ELA) position students to engage in and develop disciplinary practices that prepared them for a specialized yet connected world. The NGSS, present science as it is practiced through an interconnection of core ideas, crosscutting concepts, and scientific practices (NGSS Lead States, 2013). These interconnected ideas mirror many of those laid out in the CCSS for ELA which present literacies as the ability to read, write, listen, and use language for varying purposes (NGACBP & CCSSO, 2010).

The integration of tradebooks (e.g., picture books and narrative and non-narrative information books) has been suggested as a way to incorporate practices of reading, text comprehension, and writing imbedded within the discursive and discourse practices of science to increase students’ learning (Pearson, Moje, & Greenleaf, 2010). Tradebooks provide advantages that include invitation and inspiration for student engagement (Ansberry & Morgan, 2010; Hapgood, Magnusson, & Sullivan & Palinscar, 2004); present new ideas in interesting ways (Romance and Vitale, 2006); represent concepts, facts, and patterns; model inquiry practices and science communication (Morrison & Young, 2008; Romance and Vitale, 2006); provide experience with phenomena unobtainable in the classroom (Morrison & Young, 2008; Romance and Vitale, 2006); and illustrate nature of science and support new ideas or help address misconceptions (Barber & Cervetti, 2009; Cervetti, Pearson, Bravo, & Barber, 2006; Casteel & Isom, 1994). Much of the literature that exists around tradebook and disciplinary learning relate to resources created for students but not by students. We approach this issue by examining student created tradebooks in a novel situation, that of a middle school comic book design class. Specifically, we were interested in how students incorporate science concepts in comic book
stories that they themselves create. The research we present here are preliminary findings from pilot research around the question

How do students make sense of and contextualize their understanding of science concepts in self-created tradebook, specifically in the genre of comic book stories?

**Synergetic and Isomorphic Relationship Between Science and English Language Arts**

Science and ELA are synergistic and isomorphic with both having very similar forms of strategy and cognitive processes (Casteel & Isom, 1994; Cervetti, Pearson et al., 2006; Dyasi, 2006). Casteel and Isom (1994) represent the synergy between the disciplines as the structure of a tree. Literacy is the root system that is the base for growth and the branches signifying science knowledge, each nourishing the other and strengthening both disciplines. The roots are content information presented in writing and oral communication that feed the tree (i.e., facts, concepts, laws, and theories). Communication in the role of reading, writing, listening, speaking, and thinking connect the root system to the branches.

The isomorphic nature of both disciplines includes metacognitive approaches to help students plan, evaluate, and revise understandings; problem solving that help students structure reasoning about texts and experiences in a managed way (e.g., systematize, breakdown, and synthesize); and connection making by allowing students to build links between text, experience, and their own knowledge (Cervetti et al., 2006). Dyasi (2006) further develops this idea by presenting ELA literacy as an integral part of science inquiry highlighting the important role of communication (e.g., talking, reading, writing, and other kinds of presentation) in inquiry practices. In scientific inquiry, students communicate (e.g., talking and writing) about questions, explanations, plans, data, conclusions, and present relationships between evidence and explanations and findings. Additionally, both build upon prior knowledge, establishing purpose,
making predictions, drawing inferences and conclusions, and making and recognizing relationships. A synergistic and isomorphic representation of literacy and science that allow students to search for common processes and strategies when trying to understand content knowledge rather than encapsulating each discipline into separate, unconnected knowledge (Cervetti et al., 2006) sounds promising. Integrated approaches in which science and language arts are explored in tandem have been suggest as a say to provide students’ more time for science while engaging in language arts (Casteel & Isom, 1994; Cervetti, Barber, Dorph, & Goldschmidt, 2012; Hodson, 2009; Pearson et al., 2010).

Integrated Approach to Language Arts and Science Instruction - Tradebooks

An integrated approach builds on the relationship that children have with expressive types of literature, such as tradebooks, that help them learn in ways that may be more interesting and less intimidating to them than traditional science textbooks (Casteel & Isom, 1994; Hodson, 2009). Integrated instructional approaches incorporate language arts practices of reading, text comprehension, and writing imbedded within scientific inquiry activities emphasizing the practices of science (e.g., questioning, searching for information, etc.) and collaborative group work with attentions to personal motivations (interest and self-efficacy) to increase students’ science and language arts learning (Pearson et al., 2010).

We draw upon the work of Romance and Vitale (1992, 2001) and Vitale and Romance (2011) to illustrate an integrated approach. In their early work, Romance and Vitale (1992) studied seven demographically comparable fourth grade classes set in a large urban region of Florida. They were interested in determining if in-depth daily science teaching which incorporated applied language arts objectives with science-content based reading (using tradebooks including science print materials and a science textbook), science process skills, and
inquiry activities could increase student knowledge in both disciplines and influence the affect (attitude and self-confidence) of students. Three of the seven classes were considered treatment groups (N=51 students) in which instructional time allocated to reading was combined with in-depth science instruction allowing for two hours of teaching each day for a year. The control group (N=77 students) consisted of the 4 remaining classes and these students experienced normal instruction. This instruction consisted of 90 minutes of daily reading and language arts study and 30 minutes of daily science instruction using mostly pencil and paper activities and textbooks with occasional hands-on activities. Knowledge and affect changes were measured in students using the Iowa Test of Basic Skills reading (ITBSr), the Metropolitan Achievement Test science (MATS), and validated Likert-scale attitude and self-confidence instruments in science and reading at the end of the study. Students in the treatment group had significantly higher scores in reading and science, along with having more positive attitudes in both discipline areas and greater self-confidence in science compared to control groups. From these findings, the authors suggest that language arts and science instruction should be combined to promote conceptual change, especially in light of the increasing amount of time spent on language arts to ensure high test scores on state standardized tests. Additionally, the authors point out that textbooks, which can often be demonized as restricting student knowledge development by promoting “final form science” (Duschl, 1990, p. 10) can, instead, be used as an instructional tool in combination with other literature types and imbedded within science instruction that enhance the doing of science.

In an expanded five-year study, Romance and Vitale (2001) investigated second and fifth graders’ (N=1200) understanding of science and language arts learning and student affect. Treatment group experienced the same science instruction from their 1992 study (e.g., concept-
focused teaching, inquiry activities, science process skills, and tradebooks related to science print text) and added concept mapping and journal writing to what they termed in-depth expanded applications of science (IDEAS). IDEAS combined language arts with science for two hour of daily instruction. The control group received business-as-usual treatment with separate language arts and science instruction. ITBSr, MATS, and the Likert-scale attitude and self-confidence instruments in science and reading were administered as assessment tools to measure learning gains. Like the 1992 study, treatment group participants in this study improved in science understanding, reading achievement, and in affect towards both disciplines when compared to control groups.

Vitale and Romance (2011) then moved on to study very young children (first and second graders, N=513) from four ethnically diverse elementary schools within a large school system in Florida. In this study, the authors were interested in determining how in-depth science instruction could enhance reading comprehension. Two of the schools served as the treatment groups and two served as controls. The authors developed the treatment based on IDEAS, discussed above, in which students took part in eight weeks of 45-minute instruction that used age-appropriate science reading materials, hands-on activities, concept mapping, and journaling to emphasize in-depth, cumulative learning of science concepts. This iteration of IDEAS, unlike the third to fifth grade version, did not replace language arts instruction, but was in addition to language arts instruction. The control group had no intervention outside of normal instruction. The ITB Reading Comprehensions and Science subtest were used as student learning measures at the end of the study. This study found that young children can learn from in-depth science instruction and this type of instruction can result in significantly higher basic and reading scores when compared to traditional elementary instruction (i.e., control group). Important to these findings is
the understanding that elementary aged children can handle complex science content, which contradicts some researchers who suggest that young children are not cognitively developed enough for this type of instruction at young ages (Appleton, 2007). The results of Vitale and Romance (2011) along with their earlier work (Romance & Vital, 1992, 2001) demonstrate that exposure to science and literacy concepts through integrated approaches can increase science knowledge and proficiency in reading.

**Panacea or Problem**

An integrated approach may seem like a panacea when students are faced with reduced opportunities to learn about and take part in science. However, there are many challenges that can impede integration from implementation to support.

In 2014, The National Research Council (NRC) conducted a workshop to help clarify confusion “among teachers and administrators about how to and who should implement the literacy in science standards of CCSS for ELA and how these standards work with the NGSS” (Feder & Rhodes, 2014, p. 2). The Board on Science Education had determined this to be a top priority based on the amount of questions and nature of the questions surrounding the two reform documents and the synergy between them. Throughout the workshop, the need for disciplinary approaches as a way to develop and use science, rather than a way to learn about science were highlighted and challenges to implementation were discussed. Such challenges included differences between the kinds of knowledge and skills needed to teach across disciplines, competing time and prioritization of educational goals within the timeframe allotted for school and how the standards are addresses across grades (which tend to be more prescriptive for later grades than earlier ones), the expertise of teachers that may not be well-matched with the new
standards, and the supports needed (e.g., instructional materials, curricula, professional development).

The authors of the workshop, as well as others (Pearson et al., 2010; Settlage & Southerland, 2012), warn against implementing a text-centric focus in which students read about science rather than engage in the practices of science (Pearson et al., 2010; Settlage & Southerland, 2012). An integrated approach that imbeds language arts literacy practices within an inquiry rich science curriculum may allow students to do science rather than just learn about science.

Supports need to be provided to make the process of integrated learning valuable (Pearson et al., 2010; Pappas, Varelas, Barry, & Rife 2004) and accessible to all students. Pappas et al. (2004) suggested that integration should be supported in a collaborative, dialogic manner so student can have opportunities to discuss ideas, comments, and questions as they move through the integrated process to ensure the social nature of the interactions are fostered (e.g., recognizing, interacting, and underscoring knowledge links). We build off of this idea and suggest that instead of reading from and learning about ideas from texts created by others, students should be provided opportunities to be the creators and designers of these resources. Further, we suggest that providing opportunities for students to create their own comic books in the middle school years may serve as a bridge between elementary school when tradebooks, such as narrative and informational books, are prominent components of classroom culture to high school where students are required to take up more informationally dense texts. We discuss our choice of the genre of comic books in more detail in the next section.

Through the Lens of Comic Books

“A comic is a sequence of images between which some kind of unity of meaning is created…. A comic can be considered a complex sign which means that a global coherence is sought in interpretation” (Magnussen, 2000, p. 198). Signs are an act of communication in which
the sign is not interpreted independently but, instead, within the context of other signs. The sign in the genre of comic books is the panel. Panels interact with other panels to create external, contextualized forms of communication in service towards conveying information or producing a response in the viewer (Cohn, 2005; McCloud, 1993).

Comic books constitute a unique language that bridges interrelated verbal (linearly arranged strings of words) and visuals (codes and symbols) modes to offer a greater capacity to convey thoughts in multilayered ways (Groensteen, 2008; Sousanis, 2012). Comic books offer a space by which we can take in and create particular moments, while situating those moments within a larger landscape of time and space. Groensteen (2008) describes images as utterances, which the reader must ascribe meaning to, such that producers must choose how to “decoupage” (p. 90) or cut out meaningful moments that serve as the “narrative tissue (the key moments of the action)” (p. 90). This tissue is framed by the decisions the creator makes in terms of how they represent ideas, such as zooming in or out or focusing on a particular part of an object. We liken this framing to the creation of representations in science, which afford computational offloading (i.e., reduction of cognitive load), re-representation, graphical constraining of information, abstraction, extension or generalization of knowledge from the known to the unknown (Ainsworth, 2006, 2008).

In the genre of comic books, however, the creator must consider each representation as it is situated with textual elements, its placement of the representations within the network of panels on a page and between pages, and even interactions between events. In fact, imagery in comic books is not meant to be consumed individually, like a scientific representation might be, but instead as a cohesive whole that rely on an interconnection of ideas, which Sousanis (2015) describes as rhizomatic in nature (i.e., a plant that sends out roots and shoots as it spreads).
Panels, balloons, captions, and sound effects and the juxtaposed sequences of images within the landscape of the page serve as a hybrid between verbal and visual languages stemming from cultural and communicative interactions (Cohn, 2005). Smith, Hull, and Sousanis (2015) suggest that engagement in the multimodal nature of comic books provides a vantage point for meaning-making through the symbiotic collision between words and imagery. Sousanis (2012) describes this connection as the interweaving of verbal and visual that gives rise to transformation between lateral thinking and creativity.

Images are externalizations of our thoughts, a sort of conversation between ourselves and others (Sousanis, 2017) and are integral to meaning-making of the textual elements, unlike other types of writing in which text can stand apart from an illustration (Smith et al., 2015). Images are not additive, but inform the text used, and the text informs the images. Engagement with images and words in the format of a comic open of new avenues for understanding and connection making (Smith et al., 2015).

The process of making a comic is a negotiation between images and words and the structure of all the component parts. In this way, comics are less about skilled and technical drawing and more about the space and how the objects interact in that space to make meaning. In fact, some consider drawing a dialogic process in which thinking occurs with your hand through embodied and situated cognition (Kantrowitz, 2017). We drew upon these ideas of embodied and situative cognition when we asked students to create a comic book story that incorporated a disciplinary concept of their choosing.
Methods

Participants

We conducted pilot research in two middle school (integrated sixth, seventh, and eighth grades) International Bachelorette (IB) Comic Book Design classes in one K-8 private school in southeastern United States taught by the first author of this paper. We were interested in understanding how student created comic books can help students make sense of and contextualize their understanding of science content. Here we focus on the work of three students. One student, Charlyne (all names are pseudonyms), was an eighth-grade student who worked independently to create a comic book about the conservation of matter. The other two students, Tom and Clancy, worked collaboratively to create a comic book about animal adaptations. Tom was a seventh-grade student and Clancy was a sixth-grade student. The project occurred across ten weeks (two class periods a week for 60 minutes each).

IB Comic Book Design

The IB Comic Book Design class is based on the IB design cycle which occurs across four interrelated sections including inquiring and analyzing, developing ideas, creating the solution, and evaluating. When students inquire and analyze, they are identifying and prioritizing research to explain and justify the need, they are analyzing a range of existing products, and they are summarizing the analysis of that research. In the case of this project, students were given the need (e.g., Produce a short comic book story that shares a concept from your favorite class in an engaging and entertaining way.) and were required to research existing products in the form of comic books or animations and, also, the concept they were incorporating in their story. When students are developing their ideas, they are developing a design brief, developing design ideas, presenting and justifying their final design, and developing and planning. In this project, when
students designed their ideas they were created thumbnails of their story, which included the sequential layout of panels for each page, the dialog that would go in each panel, and a rough sketch of the scene. The development of the thumbnails merged into the next part of the design cycle when students were constructing a logical plan. Students were required to create a 10-week schedule for the activities they needed to do to complete their comic. Students planned out their thumbnailing, penciling, inking, and lettering in this schedule. Additionally, when creating the solution students demonstrate technical skills, follow their plan, and justify any changes they made to their design. The last phase of the design cycle is the evaluation phase. In this phase, student design a testing method (e.g., questionnaire) to evaluate the success of their solution (e.g., comic book). They use the data collected from this evaluation to explain the success of their solution and to inform the improvements that might be needed. This phase, concludes by having students explain the impact of the solution. Students involved in this research were still completing the evaluation stage of the design cycle at the time of writing up this research.

At the beginning of the 10-week project, students were provided with a worksheet packet which scaffolded them through the inquiring and analyzing and developing ideas phases of the design cycle. In the packet the students were presented with the need of the project. They were asked to identify the concept that they would like to explore and to research that concept. Additionally, they were asked to research existing products (e.g., comic books or animations) and to identify why they chose these products and what aspects made these products successful. Space was provided for them to explain what they learned from this research. Students were also guided to provide a brief summary of their story and to create a 10-week schedule to complete their comic. Once they had completed the worksheet, students began thumbnailing their story, they shared their thumbnails with peers, and then they got to work on penciling (the part of the
process which took the longest amount of time), inking, and lettering their comics on full sized comic book paper.

**Data and Analysis**

The student’s initial worksheet packets, their final comic books, and field notes taken by the teacher serve as data for this research. We analyzed this data to better understand how these students situated the concepts they were exploring within a comic book story. We provide a portrait of each student’s comic book and identify themes from these data.

**Findings**

Charlyne, Tom, and Clancy chose to incorporate science ideas into their comics and drew upon existing art and animation as the context to situate their work.

**Charlyne’s conservation of matter within the context of *We Bear Bears***

Charlyne choose to explore conservation of matter within the context of the animated sitcom of *We Bear Bears* (Figure 1). Charlyne situated conservation of matter within a story about Panda, one of the “We Bare Bears.” The story was centered on Panda wanting to lose weight by drinking Botox water. In the story, Panda places a glass of Botox water out to drink, however, he leaves the glass for several hours (Figure 1, Page 1, Panels 9, 10, and 11). When he comes back to drink the Botox water there is less liquid than there had been originally. Panda accuses the other bears of drinking his Botox water, but when they convince him that they had not drunk the water. Panda must figure out what happened. To understand what happened to the Botox water, Panda researches online to investigate “how the air ate the water” (Figure 1, Page 2, Panel 1). Through this search, Charlyne is able to incorporate a definition about the conservation of mass which consists of “To conserve mass you must have a closed system. If a mass is not in a closed system then the liquid will slowly evaporate.” She further elaborates on this definition by
illustrating an open and a closed system and by putting an x near the symbol for an open system and a check near the symbol for a closed system. In this way, Charlyne is situating words, symbols, and images in a networked interaction that combines the depiction and description that informs and enrich each other (Sousanis, 2012). A check represents a closed system. We see this symbol for a closed system in panel 3, page 2, which serves as Panda’s solution to the problem of evaporation. Additionally, Charlyne situates her story as a problem to solve, which requires science to explain the problem. Charlyne had been observed by the first author exploring conservations of matter in her science class, so the concept was not new to her; however, she was able to situate it in a novel way.

![Figure 1. Charlyne’s two-page comic book story about conservation of mass.](image-url)
Tom and Clancy’s story of regeneration in the context of *SpongeBob SquarePants*

Tom and Clancy chose to explore ideas of animal adaptations in the form of sea star regeneration. They situated this concept in the world of *SpongeBob SquarePants*. In Figure 2, we include two of six pages of their story to highlight the most prominent connects to the idea of regeneration. In the story, the two students develop a plot in which Patrick (a sea star and friend of SpongeBob) is attacked by SpongeBob (the main character). In the first attack, Patrick is split in half and regenerates into two Patricks (Figure 1, Page 1, Panel 8). From this initial attack, Patrick continues to find himself in harm’s way and is continually split resulting in many regenerated versions of Patrick in the setting of the *SpongeBob* universe (Figure 2, Page 2, Panels 3 and 4). The regenerated Patrick’s become evil and are no longer best friends with SpongeBob SquarePants and a series of scenes occur around the restaurant *The Krusty Krab*. The story concludes with the real Patrick identifying himself to SpongeBob and they become best friends again. Tom and Clancy do not explicitly discuss or define the concept of regeneration, although they identify it in panel 4 of page 2 when they say “Yes! They are regenerating.” Tom and Clancy, like Charlyne, incorporate their ideas of regeneration to fit the nature of comic book storytelling. In this way, Tom and Clancy are setting up a problem, however, unlike Charlyne, they are not using science to solve the problem, but, instead, they are using reoccurring themes and elements from real *SpongeBob SquarePants* storylines to explain the solution.

Interesting to this story is that Tom and Clancy drew upon the story of regeneration of a sea star, a real-life story that occurred in nature when fishermen in the Mediterranean noticed that urchin populations were decreasing because of increasing sea star predation. The Mediterranean fishermen tried to kill the sea stars by cutting them in half and then throwing them back in the water. Unfortunately, like in *SpongeBob*’s world, sea stars became abundant. It is unclear if Tom
and Clancy had preexisting knowledge about this phenomenon before developing this story or if they learned about it while they were researching regeneration.

Figure 2. Two pages of Tom and Clancy’s comic book story about regeneration.

**Exploring scientific concepts through comic book design**

Yore and Treagust (2006) suggest that the use of multiple representations may support student understanding of complex phenomena by making the phenomena more “intelligible” (p. 308) to students as they move towards sophisticated understandings. In both Charlyne and Tom and Clancy’s comic book stories they drew upon existing characters and worlds and they were able to successfully incorporate their concepts of interest into their comics. In fact, all three of the students were able to quickly incorporate their concepts into their stories once they had researched existing products (e.g., comics and animations) or the science content. In the case of Tom and Clancy, they choose the world of *SpongeBob SquarePants* and then figured out a
concept which they could explore in that world. In the case of Charlyne, she chose the concept of conservation of matter and then situated it into the world of *We Bare Bears*. In an answer on her worksheet packet, Charlyne explained that she chose to use the *We Bare Bears* because “they allowed more focus on the main characters and add personality.” Tom and Clancy responded to their choice of contextualizing their story in the world of *SpongeBob SquarePants* because “they are funny, and reference common pop culture, and they have concepts that are true.” In fact, these two students had defended their choice of *SpongeBob SquarePants* because the story creator was a marine biology student before becoming a cartoonist and animator.

These initial findings highlight the benefit of comic book design in that it provides a context for which students can ground their conceptual knowledge in ways that may be interesting and appropriate for an audience of their peers. In this way students are positioned to apply their understanding of a concept in the context of a new setting that is potentially culturally relevant to them. We surmise that the need to resituate concepts into contexts that are outside of the classroom setting may force students to think more critically about ideas they learn in school.

We find Charlyne’s problematizing of the conservation of matter particularly interesting as this follows much of the work of scientists in which they wonder about phenomenon in the nature world by making observations and they use these observations to explore and learn about phenomenon. This connection is promising and is an idea that we are working to expand upon in future iterations of this research. Future work will continue to focus on bridging students understanding of STEM concepts with their comic book storytelling, so that they can explore and contextualize concepts in ways that are meaningful to them.
Conclusion

In conclusion, we found that the three students we investigated were able to write and use language for varying purposes, as called for in the CCSS for ELA, and they were able to research and explore scientific conceptions, one part of the three-dimensional learning called for in the NGSS. Comic books served as a novel site for students to resituate their understanding of a science concepts. We emphasize the idea of resituating understanding, as we feel that the imposed constraints of the comic book genre (i.e., telling stories through a hybrid of imagery and text) required students to simplify and generalize their notions about a particular concept to a new, novel, and potentially culturally relevant situation. Additionally, the resituating of ideas in this format that draws upon the use of sequential and interconnected imagery provided opportunities for students to contextualize their own understandings into a novel context that exists outside of the ways that they are traditionally expected to express their understandings. Further, we believe student created comic books expand on many of the benefits of traditional uses of tradebooks in classrooms and build upon the benefits of inviting and inspiring student engagement (Ansberry & Morgan, 2010; Hapgood et al., 2004); presenting new ideas in interesting ways (Romance and Vitale, 2006); representing concepts, facts, and patterns (Morrison & Young, 2008; Romance and Vitale, 2006); and provide experience with phenomena unobtainable in the classroom (Morrison & Young, 2008; Romance and Vitale, 2006).

Future Direction

Lacking from the first iteration of this research is the crucial piece of engaging students in the disciplinary practices of science, so that that are not only learning or resituating a concept, but, instead, constructing knowledge as they engage in the practices and crosscutting concepts of science in the service of sense making (Allchin 2012; NGSS Lead States 2013; Passmore 2014).
In the next iteration of this research, we plan to draw heavily upon the similarities in structure between the practices of science and the design cycle and will position students to explore STEM ideas and to explain those ideas through the design of a four-part comic book story. Students will conduct four explorations over the course of the year. During each exploration, students will begin by engaging in and exploring a big idea related to energy in one of four STEM disciplines (i.e., science (S), technology (T), engineering (E), and math (M)) and they will design a comic book to explain this big idea by engaging in the IB Design Cycle.

Modeling will be emphasized throughout each of the explorations to help students continually revise their thinking as they engage in a new exploration. Modeling is a complex and adaptive system of communicative action in which learners acquire knowledge experientially through scaffolded interactions that encourage “perception, interaction, planning, research, discussion, argument, and co-construction of academic products” (Hakuta and Santos, 2012, p. ii). This system of communication draws upon “speaking, listening, writing, representation, reading, and viewing the various signs, gestures, texts, and discourses related to” doing, understanding, and communicating (Hand et al., 2003, p. 614) encompassing and bridging a broad array of disciplinary practices (Stage, Asturias, Cheuk, Daro, & Hampton, 2013). Models will serve as a scaffold to support the inclusion of increasingly more complex mechanistic explanations of energy in their comic book stories.
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Shifting the Focus: Supporting effective collaboration around disciplinary language instruction

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Abstract

This article discusses the institutional conditions and professional development moves necessary for supporting high quality vocabulary instruction within and across the disciplines. Situated within recent research around language learning and the context of three distinct university -K12 collaborations, the following questions are discussed: 1) How does a shared vision of instruction and student learning support cross-disciplinary collaboration around academic language instruction? 2) What structures support effective higher ed-K12 collaborations around academic language? 3) How can collaborations privilege teacher voice and choice? Finally, we discuss what we learned from these collaborations about supporting high-quality disciplinary language instruction.
Consider the following situation: You’re in the emergency room at your local hospital, anxiously listening to the medical resident as she reads your test results: “Depressed lateral fracture of the tibial plateau (TPF), partial meniscus tear.” All you hear is: Surgery required. Long recovery. And your heart drops. You love science, particularly Biology, but you’ve never heard of the tibial plateau before. At that moment, you have no idea how much medical jargon you’ll need to learn during the next few months to regain movement in your knee, to be able to walk again. As I (Laura; first author) write this paragraph, 11 months after a high-speed collision in a soccer game, I marvel at the sheer volume of words, phrases and questions that I needed to learn – quickly – in order to be an active participant and self-advocate during my recovery. In ways I least expected, I was forcefully thrown (literally!) into a new discourse community, one which required me to quickly adopt new ways of thinking and communicating. I consulted experts, conducted my own research and participated in a closed Facebook group, learning from others who had also suffered from a TPF.

While the specific context of Laura’s interaction with a new discourse community might be unique, language learning requires that we are attentive to context, access experts within those communities and have sustained opportunities to engage with and interact around language (Krashen, 2011; Moje, 2015). In this article, we detail the institutional conditions and instructional moves necessary for supporting university-K12 collaborations around academic language instruction within and across the disciplines.

Our discussion is grounded within our experiences working with teachers and schools through the Authentic Intellectual Work framework, the Striving Readers project, and the Multi-faceted Comprehensive Vocabulary Instruction Program. These university-K12 collaborations span elementary and secondary classrooms, and they place an emphasis on high-
quality, reflective work with classroom teachers. Through a discussion of these collaborations, we will explore the following questions: 1) How does a shared vision of instruction and language development support cross-disciplinary collaboration 2) What structures support effective higher ed-K12 collaborations around academic language? 3) How can collaborations privilege teacher voice and choice? We conclude by exploring the lessons learned and the implications for future collaborations around academic language instruction.

Research and theoretical grounding

In 2000, the National Reading Panel asserted “there is a great need for the conduct of research on these topics [vocabulary instruction] in authentic school contexts, with real teachers, under real conditions” (p. 4-27). In recent years, much has been written about disciplinary literacy instruction (Buehl, 2011, Carnegie Council on Advancing Adolescent Literacy, 2010; Moje, 2015), academic vocabulary instruction (Blachowicz & Fisher, 2000; Nagy & Townsend, 2012; Ogle et al., 2015) and about the unique language features of academic subject areas (Fang & Schleppegrell, 2010; Schleppegrell et al, 2004). However, less has been written about the ways in which university-K12 collaborations can support teacher learning around academic language. Because the Common Core State Standards have brought heightened attention to disciplinary literacy and language instruction, there is an increased urgency to support teachers in this work. This article, then, is designed to build upon and extend the extant research base on disciplinary language instruction and the design of high-quality, authentic literacy and language experiences within “authentic school contexts, with real teachers, under real conditions.”

Though our projects with K12 teachers developed independently, we (the authors) have collaborated in various capacities during the past twenty years. Currently, Donna and Camille are both emeritus professors at National Louis University in Chicago, Il and Co-Directors of the
Reading Leadership Institute. They have spent their careers exploring the role of literacy in student classroom learning, with a particular focus on disciplinary literacy and vocabulary practices. Laura first met Camille and Donna twenty years ago, when she was their student within the Reading Specialist master’s degree program at National Louis University. Since then, Laura has taught high school English and reading, serving both as a reading specialist and a secondary literacy coach. After completing her doctoral research study of secondary literacy coaches, Laura now teaches and serves as an instructional coach at the University of Wisconsin-Madison. During the past twenty years, we have worked together on a variety of literacy projects where the development of academic vocabulary has been a central component.

As a result of these collaborations, we share fundamental beliefs about what constitutes high quality disciplinary literacy instruction, and we are committed to partnering with teachers in order to implement that instruction. We all share the core beliefs that are well-articulated by the Wisconsin State Reading Association: Research grounds us, expertise matters, and literacy is a complex process requiring a comprehensive approach and a mindset shift (http://wsra.org).

**Research (and Theory) Grounds Us**

The three projects that we will describe attend to Gee’s contention that discourse communities have unique ways of thinking, talking, and writing (Gee, 2010). These discourses, which Gee refers to as “big D” discourses, are socially situated, acknowledged ways of using language, acting, behaving and thinking (2011). In school settings, students negotiate multiple Discourses during their day as they move in and out of different social and academic contexts. They interact with their peers, with adults and with the discursive demands of multiple academic subject areas. Because each academic discipline values distinct ways of thinking, talking and writing (Fang & Schleppegrell, 2008), teachers should provide students with opportunities to
explore, question and experiment with the unique language demands they encounter (Blachowicz et al., 2006; Moje, 2015). Furthermore, since disciplinary language and vocabulary are essential to disciplinary learning (Nagy & Townsend, 2012; Shanahan & Shanahan, 2008), attention to language learning is necessary if students are to engage deeply with disciplinary content.

**Expertise Matters**

As facilitators of these projects, we believe that to engage deeply with disciplinary content and become independent learners, students need to be apprenticed into the discipline-specific ways of communicating that they engage with during the school day (Fang & Schleppegrell, 2008; Moje, 2015). This requires a commitment to focused, reflective professional development for teachers, professional development that helps establish a clear vision of literacy and language instruction, honors and develops teacher expertise, and provides tools to support their work.

In addition, we believe that the goal of effective instruction is the development of student independence in their learning. Research indicates that much strategy instruction can become an end in itself rather than a tool for students’ ownership of vocabulary learning (Duke et al., 2011). Subsequently, each project promotes instruction that is efficient, effective and motivating, aiming to shift the focus from teaching decontextualized strategies to empowering students to become independent vocabulary and language learners (Blachowicz et al., 2013a; Blachowicz et al., 2013b; Ogle et al., 2016). We also agree with Brozo et al (2013) and Shanahan’s (2012) contention that both cross-discipline and discipline-specific literacy strategies play a role in supporting effective literacy instruction, and we believe it is essential for teachers to understand the rationale behind the approaches they implement. This requires that building student and teacher expertise, not mastering a singular strategy, becomes the focus of professional
development.

**Literacy is a complex process requiring a comprehensive approach and a mindset shift.** To sustain a focus on building teacher and student expertise, a school-wide commitment to shared literacy and vocabulary development is essential. The partnerships described here are grounded within that assumption and, in different ways, try to lay the foundation for school-wide conversations and shared beliefs about the how and why of disciplinary language instruction. They lay that foundation by creating, developing and nurturing departmental, interdisciplinary and school wide collaborations that involve teachers, coaches and administrators. These collaborations draw upon principles of enduring professional learning. Learning must be significant, ongoing and supported (Darling-Hammond et al, 2009); it should involve teachers and leaders engaging in collaborative, reflective inquiry (Cochran-Smith & Lytle, 1999; Joyce & Showers, 2002; Ogle, 2007); and it should be responsive to the unique context and needs of participating schools and teachers (Newmann, Carmichael & King, 2016).

**Authentic Intellectual Work: Establishing a Shared Vision of Instruction**

Laura currently works as a university-based instructional coach, helping schools and districts implement the Authentic Intellectual Work (AIW) framework. AIW (Newmann & Associates, 1996; Newmann, Carmichael & King, 2016) has been used in districts across the United States to help teachers develop intellectually rigorous, authentic instruction within K-12 classrooms. AIW coaches work with interdisciplinary, and often cross-grade, teacher teams for at least 3 years; we build teachers’ and administrators’ collective capacity to provide meaningful and challenging learning experiences for their students. We accomplish this by assessing instructional artifacts (teacher tasks, written or oral student performance and videotaped or observed instruction) that teachers bring to a series of professional collaboration meetings, using
scoring rubrics that help define what AIW looks like in the classroom. A team’s dialogue around the instructional artifacts and AIW rubrics help them develop shared understanding of common language about the goals of classroom instruction.

The AIW framework establishes a shared vision of what all instruction should be working towards, for all students within a building. Specifically, it posits that all students should engage with instructional activities that allow them to “[construct] knowledge, through the use of disciplined inquiry, to produce discourse, products or performances that have value beyond school” (aiwwisc.org). The italicized terms reflect the three core criteria that constitute the AIW framework: construction of knowledge, disciplined inquiry (conceptual understanding and elaborated communication) and value beyond school. Figure 1 visualizes the three criteria and their relationship to student learning.

*Figure 1. Authentic Instructional Work Framework*
Though not solely focused on language development, AIW privileges the real-world activities, processes and tools that are central to each discipline. Within our partner schools and districts, the AIW framework was implemented to increase the rigor of classroom instruction and to support high-quality teacher collaboration. One such district is the Green Lake School District (GLSD), a small, rural district in Wisconsin that provides an International Baccalaureate curriculum to all students in grades Pre-K-12.

AIW’s concurrent focus on both value beyond school and disciplined inquiry necessitates that teachers consider how to engage disciplinary vocabulary practices. In addition, unlike many instructional initiatives, our cross disciplinary teacher teams involve teachers from all subject areas within a school building, not just the core academic subjects. Consider, for example, one interdisciplinary, cross-grade AIW team meeting at GLSD. A physical education teacher shared multiple examples of the personal fitness plans her grade 7 students had just completed. As we scored these student artifacts using the AIW rubrics, we discussed the extent to which each personal fitness plan demonstrated a student’s understanding of the concepts central to the unit. The team agreed that some of the student samples demonstrated both understanding and application of concepts such as metabolic rate, resting heart rate, and body mass index among others. When a thorough, accurate understanding of these concepts was not evident within an individual student’s personal fitness plan, the team discussed how changes to the assignment, additional teacher or peer modeling and targeted instruction could improve the students’ work.

During another team meeting, an art teacher shared examples of 11th and 12th grade art students presenting their original artwork to their class. After watching one videotaped presentation, her AIW team discussed the level of discourse demonstrated by the presenting student and her peers. During the question and answer period that followed the student’s
presentation, other students posed questions about her use of art concepts such as texture, form, color, etc. We agreed that the students demonstrated that they were gaining fluency in the conventions of art critique and analysis. Within the AIW framework, this is referred to as Elaborated Communication. When scoring student performance using the Elaborated Communication rubric, an AIW team’s discussion centers around the extent to which “the elaboration provided [by the student] is consistent with extended forms of communication in the field being studied” (Newman, King & Carmichael, 2009, p. 68). In order to support this conversation with her AIW team, the art teacher needed to clearly articulate the disciplinary language practices that she hoped students would demonstrate at the conclusion of this particular unit.

In the two examples above, the AIW framework and its accompanying rubrics provided a vision of what constitutes rigorous disciplinary instruction that has value beyond school. This vision helps shape powerful team conversations about disciplinary language, and when enacted within teacher’s instruction, it requires that students demonstrate their mastery of the vocabulary and language conventions that are central to a particular discipline.

The next section explores how Camille and her team designed a study that involved teacher participants in the development and enactment of professional development around vocabulary development.

**Structures and Processes of the MCVIP Project: Windows on Teacher Development**

The Multifaceted Comprehensive Vocabulary Instruction Project (MCVIP) was a three-year, multi-site formative-design study funded by federal Institute of Education Sciences. A collaboration between the University of Missouri, National Louis University and the University of Wyoming, MCVIP sought to achieve the following outcomes: 1) Expand existing knowledge
about vocabulary teaching and learning in upper elementary grades across the discipline, 2) implement the 4-component model articulated by Graves and others, 3) see if and how teachers can address these components effectively in their classrooms and 4) develop transferrable processes and tools for staff development and instruction.

James Baumann was the principal investigator of the project, and Camille headed the Illinois team from National Louis University; this team worked closely with four 4th and 5th grade teachers in a large, multi-lingual elementary school near Chicago, IL. Using the principles of formative-design research established by Reigeluth & Frick (1999), the MCVIP team began by sharing the project goals with participating teachers. These teachers were asked to consider their thoughts/reactions about these goals and bring these thoughts to their first meeting. In addition, the research team interviewed each teacher to learn more about their questions and concerns regarding vocabulary instruction. Table 1 below displays sample teacher interview responses, as well as potential implications for the ensuing professional development work.

Table 1. Sample Interview Data and PD Response

<table>
<thead>
<tr>
<th>Teacher Comments</th>
<th>Theme</th>
<th>PD Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>“I know some things about vocabulary but I am not sure I know the right things.”</td>
<td>Lack of confidence about knowledge base</td>
<td>Focus on building current knowledge of research based practices and developing a shared perspective and vocabulary</td>
</tr>
<tr>
<td>“We have had a lot of PD in our district (in vocabulary) but it is all kind of swirling around in my head.”</td>
<td>Lack of framework</td>
<td>Use of component framework to organize knowledge and practice</td>
</tr>
<tr>
<td>“Where will I find time for these things and what will I have to give up?”</td>
<td>Concern about time</td>
<td>Explicit suggestions for where to incorporate components; based on observation and discussion and ideas for freeing up time; focus on disciplines</td>
</tr>
</tbody>
</table>
The data collected during these interviews were shared at the first meeting, and the group decided, collectively, how they should meet and work together. In this way, the project goals were translated into action.

As seen in Table 1, teacher interview data revealed the absence of a coherent vision, or framework, for comprehensive vocabulary instruction. Central to MCVIP was the development of a research-based framework validated by the iterative processes described below that anchored the team’s work. Based on the four component model created by Graves (2006) and consistent with work of Baumann (Baumann, Kammenui & Ash, 2003) and her own research with Peter Fisher (2000; Blachowicz, Watts-Taffe & Fisher, 2006), the framework detailed four elements of effective, sustained vocabulary instruction: 1) Foster word consciousness, 2) Teach Individual Words, 3) Teach Word Learning Strategies and 4) Provide rich and varied language experiences.

In order to build teacher capacity for engaging with these four components, the team devoted time to building knowledge and practice, applying their new learnings in their classroom contexts and documenting and disseminating their new learnings. Each bi-weekly or monthly meeting included a presentation of knowledge and instructional modeling, followed by a formal solicitation of the teachers’ responses to that new knowledge. Table 2 lists the questions that helped to solicit the teachers’ responses at different points during the MCVIP team meetings.
Table 2. Formative Processes and Feedback

<table>
<thead>
<tr>
<th>Team Process</th>
<th>Activities</th>
<th>Questions to solicit refinements to process</th>
</tr>
</thead>
</table>
| Knowledge and Practice-building and sharing (Bi-weekly or monthly) | Knowledge presentation  
Instructional modeling                                                                 | What response do you have to this? What questions or objections?  
What suggestions?  
How shall we move forward? |
| Application-in-Practice                          | Teachers all tried the same approach in their classrooms.  
Brought logs, videos and student work to share with team. | What did you try? How did it work?  
What would you do to improve what happened?  
What other comments/suggestions do you want to make? |
| Documentation and Dissemination                  | Built a “tool” set                                                        | What do we have to share?  
How can we share it? |

These iterative discussions refined the models of instruction that the teacher-researchers developed with their teams. A major outcome of the documentation and dissemination of the “tool set” within the school, the district and the larger educational community by the teachers was the culminating accomplishment of this MCVIP site.

**Striving Readers**

In contrast to Laura and Camille’s discussions of their work with a small rural district and one school, Donna worked as the senior literacy consultant with the Chicago Public School system (CPS). The Striving Readers (SR) project was a four year, federal government-funded collaboration between the Chicago Public Schools’ Office of Literacy and National Louis University. A central goal of SR was to enhance teachers’ attention to academic reading and vocabulary instruction for middle grade students in urban, low-achieving schools in Chicago.
The grant application was based on a successful middle grades project involving eight schools. That project had focused on developing strong building-level literacy teams (lead literacy teachers, building reading specialists, and building principals) supported by Office of Literacy coaches.

Participants and Processes. The Striving Readers grant extended the work that had been accomplished by the Middle Level Reading Project. A SR Project Director, the senior consultant, Donna, and four district literacy coordinators were charged with creating the design and process for the multi-year research effort. Schools serving the lowest income students were eligible to apply to be part of the SR Project. From the pool of applicants, 16 schools were selected to be part of the first cohort. At the start of year two, a second cohort was added, bringing in 15 more schools. Each SR school designated one Literacy Intervention Teacher (LIT) to coordinate work at the school level and to provide intervention instruction to Tier 2 students. In total, over 300 teachers and principals were part of the effort. This meant that finding times to meet with participants in smaller groups was essential. Monthly meetings with principals, bi-monthly meetings with teacher groups, and weekly school meetings of the literacy teams led by the LITs, and meetings of the SR leadership team become the contexts for discussion of research instructional approaches and for sharing on-going school implementations.

In trying to reach a large number of teachers in all of the Striving Readers schools while simultaneously educating the SR coaches and building leaders, the SR team decided to focus on the development of and professional support for new integrated instructional units. These unit guides would demonstrate how to provide supportive literacy instruction while teaching content. In addition, new supplementary materials would make this process more appealing to teachers. The SR coordinators and director worked with Donna to develop two instructional units for each
grade level for social studies and science. Mathematics was added later. These units were designed to help classroom teachers attend more deeply to the disciplinary literacy demands of their content areas. Figure 2 provides an example of one of these integrated Unit Guides.

*Figure 2. Sample of integrated Unit Guide*

The guides followed the model of activating prior knowledge, building new understandings, and consolidating learning (Ogle & Lang, 2007).

Attention to academic vocabulary was central: the vocabulary in potential texts was analyzed to ensure the texts supported the goals of the curriculum; short pre-assessments of students’ knowledge that asked them to sort terms according to categories of information were developed; and activities to help students build knowledge of important terms and concepts were included. Figure 3 shows a concept cluster that was used to introduce the unit on Ancient Egypt.
Figure 3: Example of Concept Cluster

Concept Cluster – Pre-Post Knowledge Check

ANCIENT EGYPT

Choose words from the lists below and put them under the appropriate category or concept. Use as many of the words as you know and only use the word once.

<table>
<thead>
<tr>
<th>Africa</th>
<th>Archaeologist</th>
<th>Architect</th>
<th>Astronomer</th>
<th>Decomposing</th>
<th>Egypt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Embalmer</td>
<td>Hieroglyphs</td>
<td>Desert</td>
<td>Nile River</td>
<td>Pharaoh</td>
<td>Preserved</td>
</tr>
<tr>
<td>Pyramid</td>
<td>Quarries</td>
<td>Sarcophagus</td>
<td>scribe</td>
<td>Silt</td>
<td>tomb</td>
</tr>
</tbody>
</table>

IMPORTANT LOCATIONS

____________________
____________________
____________________
____________________

MUMMIFICATION

____________________
____________________

PEOPLE

____________________
____________________

Because of the wide range of reading levels in these schools, we chose to supplement the basic instruction with collections of short books at a range of reading levels that were highly visual and interesting.

These were the focus of staff development sessions with teachers after school and on Saturdays. Receiving a set of books was an incentive and reward. The coordinators and building-level LIT followed up on the larger group meetings with weekly meetings in individual buildings. They also conducted demonstration lessons to further support the lesson assessments.
and activities explained in the Unit Guides. These meetings provided opportunities for ongoing learning and experimentation among teachers. Other components of the project focused on ways instruction for Tier 2 readers could be enhanced.

Within the range of schools in the SR project there were significant variations in implementation and success (Tunik & Simon, 2011). The most successful schools shared several characteristics: true teaming was visible among teachers, the project maintained a central position within the school despite competing priorities, the SR building meetings became venues for discussion of student learning and instructional issues, and the principals were actively involved and regularly attended the monthly principal meetings.

**What We’ve Learned**

**The Value of Participant Voice and Choice**

While the three partnerships described above differ in scope and process, they have revealed important lessons about how university educators can support disciplinary language instruction. First and foremost, university partners must position themselves as true partners and co-learners as they engage with teachers and administrators. In the context of Camille’s work with MCVIP, that meant developing a formative design approach that was responsive to the needs of the participating K12 educators. Teachers played a crucial role during all aspects of the study; they contributed as informants and co-researchers and, later, co-disseminators of the findings.

While the AIW framework articulates a clear, detailed vision for instruction, participating teachers and administrators determine what artifacts are brought to the team scoring sessions, In addition, they articulate what kinds of feedback they would most like to get from their peers and from the AIW coach. As an AIW coach, Laura honors the existing initiatives, funds of
knowledge and successes already in place within a school or district. In the Green Lake School District, this meant that the scoring sessions had to be responsive to the requirements/demands of the International Baccalaureate curriculum. In other words, Laura needed to be explicit about how AIW could support – not supplant – and improve – not ignore – the IB units and assessments that teachers were creating.

Donna and the leadership team developed the foundational text sets and created the Unit Guides giving teachers clear, practical examples of what they could do to support content literacy instruction. The process of discussing the types and range of books to include in the text sets, deciding on the assessments that could be used to help teachers focus their instruction appropriately, and building a set of instructional activities for each unit was a rich form of shared professional development; these processes allowed the team to share and build knowledge of practice together. Throughout the project, regular meetings in schools and with the leadership team provided ongoing forums for reflecting on what was working in classrooms and what needed adapting or expanding.

**A Clear, Coherent Vision and/or Framework**

Often, K12 staff are barraged by a myriad of instructional programs and professional development initiatives with competing or incongruent visions of effective instruction and student learning. This results in a lack of coherence exists between these programs (Newmann, King & Youngs, 2000). In some cases, higher ed partnerships can add to the incongruence that many teachers experience. However, when we position ourselves as critical friends and partners, and when we remain responsive to schools’ and teachers’ realities and stated needs, we can help lay the foundation for increased coherence.

One way of accomplishing this is to establish a clear, coherent vision of what all
instruction within a school should be working towards. The Authentic Intellectual Work framework accomplishes this by articulating the following goals for all classroom instruction: students should be engaged in the construction of knowledge and disciplined inquiry to explore questions, content and discourses that have value beyond school. This shared vision, developed within team scoring sessions, requires teachers to discuss the disciplinary demands of particular content areas.

Crucial to the MCVIP’s success was the development of a framework for vocabulary learning; this research-based framework guided the participants’ work, and it responded to the teachers’ expressed need for a common language around what constitutes effective vocabulary instruction.

Clearly stated goals and frameworks were articulated in the funding proposal that gave rise to the Striving Readers project. Bringing these goals to life and finding the way to model for teachers across a disparate set of schools took many forms and evolved over time. The clear project design and a vision shared by consultants and partner helped enormously. However, early on the project suffered from a multitude of conflicting priorities in the schools, turnover of staff, and district changes that resulted in alterations that diverted effort from the project.

**Extended, protected time for collaboration**

The multi-year nature of each of these collaborations also was an essential ingredient in their success. Our partnerships depended on our ability to help cultivate respectful, safe and trusting professional relationships; these evolved over time. We each reflected about how difficult some of the relationships were during the first year of our projects and how grateful we felt that we were able to find ways to reach out and bond with our colleagues; often it was the unexpected and personal serendipities that brought us together: a colleague’s celebration,
attending a conference together and having time for meals, or a new position to support. This also required being flexible and listening to each other share our collaboration-building efforts.

**Implications for Future Collaborations**

We hope to embark on new partnerships around disciplinary literacy and language in the coming years. Our presentation at the American Reading Forum conference, on which this paper was based, afforded Camille, Donna and Laura the opportunity to come together and discuss the common challenges and successes that we encountered as we engaged with K12 teachers, coaches and administrators. These continued reflections and critical conversations are essential, as these projects can be simultaneously stressful, challenging and inspiring.

We spoke often about the need to engage with this work as inquirers. Entering partnerships with hypotheses and experimental designs, not answers, makes the possibility of their success much more likely. Teachers don’t like to be the objects of someone else’s grand design; most want to be contributors and experimenters. Finding the stance that makes this orientation clear is so valuable.

Ultimately, Michael Fullan’s (2002) words resonate deeply with us. “The single factor common to every successful change initiative,” he writes, “is that relationships improve. If relationships improve, things get better. If they remain the same or get worse, ground is lost. Thus leaders must be consummate relationship builders with diverse people and groups,”. Only then can one have a true learning community dedicated to the complex, exciting challenges that attention to disciplinary literacy requires.
To Learn More

Authentic Intellectual Work
http://aiwwisc.org

Multi-faceted Comprehensive Vocabulary Instruction Project
References


Literacy. 53(7), 587-597.


Newmann, F.M., King, M.B. & Carmichael, D.L. (2009). *Teaching for Authentic Intellectual Work: Standards and Scoring Criteria for Teacher’s Tasks, Student Performance, and*


Abstract

This action research study presents an instructional approach for both ELL’s and English-only students for whom lack of academic word knowledge is the critical barrier to text comprehension. The on-going study of academic vocabulary development and reading comprehension of complex text has been implemented over nine years with sixth through twelfth grade students in Reading, ELA and content area classes. The instructional approach is characterized by “massive” vocabulary support for complex text, implementing text-specific vocabulary scaffolds called core word lists, before-reading and after-reading routines that frontload reading and writing to text with oral rehearsal, during-reading student-centered peer collaborative interactions to create a comprehensible text reading, and morphological analysis of text-based vocabulary. Specific components of the approach include word consciousness routines, teacher-led interactive reading routines, student-led interactive reading routines, digital and interactive vocabulary tools, developing depth of vocabulary tools and routines, and text dependent questioning. Both qualitative and quantitative findings suggest that the approach has merit in increasing academic vocabulary and reading comprehension with both English-only and English language learners.
Purpose

This article shares findings from an action research project on an instructional approach developed and implemented to increase both academic vocabulary and reading comprehension of secondary level, striving adolescent readers, both ELL and English-only. There is a paucity of research that addresses vocabulary development with secondary level students, and even fewer studies have proposed solutions for older striving readers. This project responds to several areas of historic need (Allington, McCuiston & Billen, 2015; Lesaux, N.K., Kieffer, M. J., & Faller, S. E. 2015; Nagy, Townsend, Lesaux & Schmitt, 2012), which include:

- Comprehensive vocabulary approaches for secondary level students
- Instructional routines that maximize collaborative student interactions
- Opportunities for academic language learning within the context of its use
- Language interventions that support both English-Only and ELL’s

Background/Context

The goal of this school-based action research project has been to two-fold. First, to identify and develop supports that increase achievement in reading of complex academic text by secondary level students—supports we have found to be inextricably connected to academic language acquisition for both English-Only speakers and ELL’s. Second, to test the effectiveness of these supports for word-weak adolescent readers.

Historical baseline data highlighting the need for a language-based approach to literacy development came from multiple sources—high stakes achievement test scores, standardized vocabulary measures, curriculum based assessments, teacher observation including anecdotal records, and informal student interview—all pointing to weak language skills as a recursive factor limiting academic success of our striving adolescent readers. Lack of access to complex language is particularly disastrous for English language learners, bi-dialectic, or economically disadvantaged students for whom vocabulary development already lags behind their grade level peers, compounding the Matthew Effect (Stanovich, 1986) whereby the word-rich get richer and
the word-poor get poorer. Lesaux, Kieffer & Faller (2015) describe the exponential impact of word knowledge on *metacognition* in this way:

“…students who know more words have more abstract language at their disposal with which to be strategic while reading, and students with developed understanding of language and strategies to manipulate language will learn words more successfully.” (Lesaux, N.K., Kieffer, M. J., & Faller, S. E., 2015 p. 197)

Nagy and Townsend (2012) further elaborate on the relationship of cognitive development to academic language:

“Academic thinking involves the cognitive processing of disciplinary concepts and phenomena, which would be near impossible without academic language.” (Nagy & Townsend, 2012 p. 92)

Over the course of this longitudinal study, and supported by research in both adolescent reading development and second language acquisition, we, (the reading coach and a small cohort of teachers), have developed a set of routines and text-specific vocabulary scaffolds to support striving adolescent readers with the complex texts of school with *explicit and extensive attention to academic word meaning*—in teacher and student-led read-alouds, text discussions, shared reading in book groups, word study, and writing to text.

**Theoretical Framework: A Cross Pollination of Literacy and Language Acquisition**

The theoretical framework for this study draws on research from both adolescent literacy development and second language acquisition—which has created a reorientation in our thinking about reading as one of four interconnected language domains-listening, speaking, reading, writing, rather than as a separate academic study.

**Relevant Research in Second Language Acquisition**

In a very real sense, the academic language of schooling represents a second language for word-weak students, who must master listening, speaking, reading, and writing in academic discourse to participate in literacy tasks across the curriculum. Findings from the research in SLA clearly dovetailed with what we observed in our struggling ELL and English-Only readers,
problems we initially classified as reading difficulties, and which we have come to re-vision as challenges of language acquisition. We found a framework for strategy development in the research on developmental stages of second language acquisition: receptive or preproduction, early production, speech emergence, intermediate, and advanced language proficiency (Echevarria & Short, 2008-2014; Krashen, Terrell, 1983)—which very strongly parallel our observations of learning behaviors among striving readers grappling with complex academic language—across language domains. This foundational understanding shaped the overall taxonomy of supports in our instructional design: frontloading expressive language demands with receptive language input. In developing instructional contexts, we acknowledge Cummins’ (1980) distinction between basic interpersonal communicative skills (BICS) of conversational language, and cognitive academic language proficiency (CALP) required for success in school tasks. The former is acquired through interaction in casual contexts, the latter requiring direct instruction in both form and use.

Opportunity for extensive reading is additionally identified throughout the research in SLA as key to vocabulary development in second language acquisition, (Hu, M., & Nation, I. S. P. 2000; Krashen, 2004, 2012, Nation, 2006; Nation & Waring, 1997), as well as the positive impact of multiple meaningful exposures on word learning (Cobb, 2000-2015; Joe, 2010), so both of these elements—extensive reading and multiple meaningful exposures to academic vocabulary—were built into the reading routines. Research findings on the effect of breadth and depth of vocabulary knowledge on text comprehension (Ehsanzadeh, 2012; Laufer, 1989, 1992, 1997; Marzban & Hadipour, 2012; Wesche, M. & Paribakht, T.S., 1996) influenced the development of instructional materials to support both of these dimensions. Research suggests that depth of vocabulary, as much as breadth, influences text comprehension, and so we developed several routines requiring students to apply morphological analysis to recently
acquired academic words. In this way students applied the new (the understanding of word parts), to the known (the recently acquired vocabulary) with evidence of significant transfer to other, related, unfamiliar words.

Other theoretical principles from second language acquisition incorporated into instructional design include the affective filter hypothesis – which influenced both the teacher-led language previews and collaborative design of student interactions -- and the comprehensible input hypothesis (Krashen, 1982), which influenced our development of explicit vocabulary lists to scaffold the comprehensible reading of complex text. The taxonomy of language systems discussed by Emig (1977): that listening and speaking are first order processes, and reading and writing are second order processes, influenced the ordering of our language activities and tasks, whereby reading and writing tasks are preceded by oral rehearsal in speaking and listening tasks. Finally, research in the assessment of vocabulary growth influenced our data collection instruments and methods in considering both breadth and depth of word knowledge (Anderson & Freebody, 1981; Cobb 2000-2015; Nation, 2012).

Relevant Research in Literacy Development

Studies that have influenced the framework and instructional design of this project fall into eight interrelated areas of literacy research, and mesh well with the findings from second language acquisition. These include: positive correlations of vocabulary/word knowledge to reading comprehension (Baumann, 2005; Carver, 1994; Elleman, Lindo, Morphy, & Compton, 2017; Kamil, M.L., 2004; Perfetti & Stafura, 2016; Robb, L. & Ganske, K., 2014), the positive impact of reading volume on vocabulary development, (Anderson & Nagy, 1991, 1992; Hirsh, 2003; Krashen, 2004, 2012) the necessity of supporting academic language learning within the context of its use in reading and writing tasks (Nagy, Townsend, Lesaux & Schmitt, 2012; Perfetti and Stafura, 2016), the need for multiple (fourteen or more) meaningful exposures for
word learning (Beck, 2002; Biemiller, 2006; Biemiller & Boote, 2006; McKeown, Beck, Omanson & Pople, 1985; Schmidt, Jiang & Grabe, 2011; Stahl, 2003, 2005;) parallels in academic language development challenges for both ELL’s and English-Only students, (Lesaux, Kieffer, Faller, & Kelley, 2010; van Steensel, Ooostdam, Gelderen, Schooten, 2016), that effective instructional components for vocabulary learning should include rich and varied language experiences, developing word consciousness, explicit instruction of individual words, and word learning strategies (Beck, McKeown & Kucan, 2002; Biemiller & Boote, 2006; Cervetti & Hiebert, 2015; Graves, M.F., 2009; Graves, M.F & Watts-Taffe, S.M., 2002; Stahl, 1983), and revisioning reading as language acquisition (Nagy, Townsend, Lesaux & Schmitt, 2012; Uccelli, Galloway, Barr, Menses & Dobbs, 2015)

Unquestionably, features other than vocabulary contribute to challenges of text comprehension-including sentence structure, coherence, organization, and learner features-- such as heritage language, culturally influenced “ways with words” (Heath, 1983) and background knowledge (Hiebert, 2012; Shanahan, Fisher, and Frey, 2012). Uccelli et al, (2015) identify six core academic language skills (CALS) necessary for comprehension of complex text: unpacking complex words, comprehending complex sentences, connecting ideas logically, tracking participants and themes, organizing analytic texts, and recognizing academic register. However, we believe that the prerequisite for development of these six core skills is explicit and extensive academic word knowledge. This lexical paradox (Cobb, 2007) presents a profound challenge to word-poor students (italics added):

the lexis of texts, at least in languages like English, is far more extensive than the lexis of conversation or other non-textual media. Thus prospective readers of English must bring to reading the same knowledge they are intended to get from reading. 2007, p. 1

When we administered the Vocab Size Measure Test (Nation, 2012) to students enrolled in Intensive Reading classes, the average number of known word families was just 8000 in all
subgroups: African American, white, and ELL. This comprises slightly more than 50% of the word families necessary for independent academic reading of complex text, and a fraction of the 40,000 word families English-only 12th graders were estimated to know three decades ago (Nagy & Anderson, 1984; Nation and Waring, 1997). Small wonder our Intensive Reading students failed to achieve with complex text.

Research Design

The research design was determined by the locus of activity—initially taking place in a public sixth through twelfth grade comprehensive school, and continuing at a public high school, with all of the de facto constraints of place and time and personnel.

This was, and is, an action research project that grew out of concern regarding the failure of our Intensive Reading students to meet the grade level benchmarks on the annual high stakes State literacy assessments. Each scholastic year, the challenge of passing the Florida State Assessments-FSA (formerly the Florida Comprehensive Achievement Test-FCAT) assumes a greater and greater urgency, as graduation from high school requires a passing score in both reading and math on the FSA. So very simply—our initial emphasis was to systematically develop and put into play “what worked” to move our students toward that benchmark. The power of action research is in the responsiveness it allows the researchers and participants to modify and refine the process to best support student achievement, and over time, “what worked” has gradually become a refined and particular set of tools and routines that have consistently scaffolded student success as measured by the FCAT and FSA, Vocabulary Size Measure (Nation, 2012), District Interim Reading Assessments (modeled on the FSA), and teacher-created curriculum-based tests.

Method

Participants
Teachers and students from two schools have been involved in the research study, as they were the workplace of the primary researcher (the school-based reading coach), and have contributed substantially to the development of the instructional routines and materials.

Figure 1.

<table>
<thead>
<tr>
<th>Academic Years</th>
<th>School Type</th>
<th>Grades</th>
<th>Classes</th>
<th>Approximate # of Students</th>
<th># of Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007-2008</td>
<td>Comprehensive</td>
<td>6th through 12th</td>
<td>Intensive Reading ELA Law Studies</td>
<td>600 600 700 400 400</td>
<td>7 5</td>
</tr>
<tr>
<td>2008-2009</td>
<td>Rural</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009-2010</td>
<td>Comprehensive</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010-2011</td>
<td>Rural</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011-2012</td>
<td>Rural</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012-2013</td>
<td>High School</td>
<td>9th and 10th</td>
<td>Intensive Reading World Geography</td>
<td>600</td>
<td>5</td>
</tr>
<tr>
<td>2013-2014</td>
<td>Urban</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014-2015</td>
<td>Urban</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015-2016</td>
<td>Urban</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Instructional Design

Over the course of the school year, students in single block Intensive Reading classes were introduced to twelve routines to support text comprehension and academic vocabulary development.

Figure 2. Twelve Routines for Text Comprehension and Vocabulary Development

<table>
<thead>
<tr>
<th>Before Reading</th>
<th>Word Work</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developing Word Consciousness</td>
<td>Developing Breadth of Vocabulary</td>
</tr>
<tr>
<td>Routine 1- Look and Listen</td>
<td>Routine 8-Student Generated Core Word Lists</td>
</tr>
<tr>
<td>Routine 2 Echo</td>
<td>Routine 9- Digital Vocab Tools</td>
</tr>
<tr>
<td>Routine 3- Call and Response</td>
<td>• COMPLEAT Lexical Tutor-CLOZE</td>
</tr>
<tr>
<td></td>
<td>• quizlet.live, Kahoot it</td>
</tr>
<tr>
<td>During Reading</td>
<td>Word Work</td>
</tr>
<tr>
<td>Interactive Reading</td>
<td>Developing Depth of Vocabulary</td>
</tr>
<tr>
<td>Routine 4- Teacher Led Oral CLOZE</td>
<td>Routine 10: Academic Word Problems</td>
</tr>
<tr>
<td>Routine 5- Whole Class Whip Around</td>
<td>Routine 11: Prefix &amp; Root-Word Dictionary</td>
</tr>
<tr>
<td>Routine 6- Partner Read</td>
<td>Routine 12: Academic Word Builder Games</td>
</tr>
<tr>
<td>Routine 7- Four-Part Partner Read</td>
<td>• Academic Word Builder Uno</td>
</tr>
</tbody>
</table>
We deliberately structured our student-active reading routines to explicitly address factors we observed to inhibit literacy learning of our adolescent students. These included lack of social interaction in typical reading tasks, student inattention to unfamiliar words (lack of word consciousness), reluctance to reveal fluency problems in shared reading, the tendency of students to inflexibly self-identify as either literacy novices or literacy experts, limited exposure to complex text across the curriculum, and a general lack of purpose or stamina for reading. In this endeavor we were influenced by practices in second language acquisition and literacy development (Cummins, 1980; Echevarria & Short, 2008-2014; Krashen, 1982) that frontload reading and writing activities with oral language practices emphasizing listening and speaking (Emig, 1977). In addition to the vocabulary and reading routines—and in response to our data from the Fall 2015 Vocabulary Size Measure Test (Nation, 2012) indicating that the striving readers in our Intensive Reading classes knew fewer than 8000 word families-- we also developed text-specific scaffolds called Core Word Lists for each complex text students were required to read.

**Core Word Lists**

A Core Word List is a language support intended to scaffold the word-knowledge gap between reader and text by making the academic language of the complex text comprehensible (Israel, 2013). Therefore, it contains all the abstract and academic language we anticipate to be unfamiliar to our adolescent students. The criteria for Core Word List include:

- List each target word in the order in which it first appears in the text
- Create as close to a one-word definition as possible.
- Define the word as it is used in the text.
- Match the part of speech of the definition to the target word it defines.
This method is effective for developing academic discourse “such as the use of related parts of speech: success, successful, succeed…” (Scarcella, 2008) as well the acquisition of both domain specific and general academic words:

“Domain-specific terms, such as erosion, Newton’s third law of motion, rhombus, and metaphor, are sure to receive instructional emphasis in today’s classrooms. However, these words are usually surrounded by other essential but more general academic terms, such as exerts, estimates, determines, distributed, resulting, culminates, and classify. These words, every bit as much as those in the first list, are used in particular ways in the various disciplines and warrant instructional attention.” (Shanahan, Fisher & Frey, 2012, p 58)

**Implementing the Routines in Classroom Practice**

Explicit how-to information on implementing the routines, and the rationale for their use can be found at [www.dynamic-reading.com](http://www.dynamic-reading.com), under the *Course in Words* tab.

**Figure 3. Example Core Word List**

<table>
<thead>
<tr>
<th>ORDER</th>
<th>TARGET WORD</th>
<th>Meaning in Text</th>
<th>AWL</th>
<th>SAT/IOH List</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>section</td>
<td>area or part</td>
<td>section</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>extended</td>
<td>allowed to spread</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>substantial</td>
<td>major, of weight or importance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>dispute</td>
<td>argument, disagreement</td>
<td>dispute</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>fugitive</td>
<td>runaway</td>
<td>fugitive</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>clause</td>
<td>phrase, sentence</td>
<td>clause</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Constitution</td>
<td>basic law of the US</td>
<td>constitution</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>suppression</td>
<td>elimination, ending</td>
<td>suppression</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>foreign</td>
<td>overseas, from other countries</td>
<td>foreign</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>enforced</td>
<td>carried out</td>
<td>enforced</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>abide</td>
<td>live, tolerate</td>
<td>abide</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>legal</td>
<td>under the law</td>
<td>legal</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>obligation</td>
<td>responsibility</td>
<td>obligation</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>ultimately</td>
<td>in the end</td>
<td>ultimately</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 4. Instructional sequence.**

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine 1-Look and Listen</td>
<td>Routine 5-Whip Around</td>
<td>Routine 9-Digital Vocab Tools</td>
</tr>
<tr>
<td>Routine 2-Echo</td>
<td>Routine 6-Paired Reading</td>
<td></td>
</tr>
<tr>
<td>Routine 3-Call and Response</td>
<td>Routine 7-4 Part Partner Read</td>
<td></td>
</tr>
</tbody>
</table>
Routine 4- Oral CLOZE

<table>
<thead>
<tr>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine 10-AWL Problems</td>
<td>Routine 10- AWL Problems</td>
</tr>
<tr>
<td>Routine 6-Paired Reading</td>
<td>Routine 11-Affix/ Root-Word Dictionary</td>
</tr>
<tr>
<td><em>Writing to Text</em></td>
<td><em>Text Dependent Questions</em></td>
</tr>
<tr>
<td>Routine 8: Student Generated Core Word List (as needed)</td>
<td>Routine 12-Word Builder Games</td>
</tr>
</tbody>
</table>

The instructional sequence for the routines is as follows. R1: The teacher introduces the academic language of the each text by providing an oral rehearsal of target words for the text selection under study for that day. R2 and R3: Students associate the target words to the meanings in text. R4: Students participate in a teacher-led reading, embedding the word meanings in text. R5, R6, and R7: Students read collaboratively embedding the meanings in text. R8: (used as necessary) Students learn how to make effective use of digital language reference materials, i.e the thesaurus, online etymology, to create student generated core word lists, R9: Students use digital web-based tools to develop breadth of vocabulary through multiple exposures to target words in interaction with peers, R10, R11, R12: Students use teacher-created materials to develop depth of vocabulary, to increase morphological awareness with newly acquired academic words, and to support knowledge transfer of word parts and affixes to other, related words.

**Training**

As the reading coach I have been uniquely positioned to facilitate this project. The District coaching contract requires academic coaches to be actively engaged with faculty in data collection and analysis, coaching conversations, modeling, side-by-side teaching and reflecting on practice. I employed modeling and side-by-side teaching to train teachers in the routines, using the gradual release model (Fisher, D. & Frey, N., 2008, 2014) to introduce, support, coach,
and refine teacher proficiency in implementation of the routines. Training typically spanned three to five consecutive days when teachers began a new complex text selection—the length of time somewhat dependent on the length of the text. I began by modeling the word consciousness routines for one or two periods with the teacher’s students in his/her classroom. Typically I co-taught for an additional period, and then provided side-by-side coaching for another period until the teacher felt confident with the process. The teacher would then teach the remaining classes of the day independently and we would try to meet to debrief and reflect that afternoon or the following morning. The following day I would repeat the process with the interactive reading routines, which the teacher would then continue to implement over as many days as necessary to complete the text selection. The developing depth of vocabulary and word-building routines 8 and 9: Student-generated Core Word List and Digital Vocab Tools, were taught through PLC’s and on-site professional development to both reading department faculty and other interested teachers. The same method of modeling, co-teaching, side–by-side coaching, debriefing and reflecting was employed for the developing depth of vocabulary routines 10, 11 and 12: Academic Word Problems, Affix/Root-Word Dictionary, and the Word-Builder Games. These were only implemented after students had completed the text readings, responding to text dependent questions, and writing to text. Additional training and support was also offered when I observed lack of fidelity to the routines. As is characteristic of action research, refinements and adaptations in the materials and routines came about through shared data collection and analysis, coaching conversations, and participation in PLC’s.

**Data Collection**

In order to provide a cross section of teacher and student perception and interaction, sources of qualitative data include ethnographic observational data, student documents, and informal interviews with staff and students. Quantitative data include State assessments, school-
based assessments, and district test scores, in academic language and text comprehension.

In addition to collecting test scores, during daily coaching walkthroughs I observed routines in action, took field notes, and conversed with students and teachers on their progress in listening, speaking, reading, and writing with complex text. The reading department also meets weekly (as scheduling permits) in school-mandated professional learning communities which provides another forum for communication among the adult participants, and I scripted notes, or reviewed comments on pertinent agenda items from those weekly meetings as well.

**Assessment Measures**

Four types of assessments were used for data collection:

- State Assessments in ELA and Reading
- District Interim Reading Assessments (DIA’s)
- Vocabulary Size Measure Test (Nations, 2012),
- Teacher and coach-created curriculum-based vocabulary tests

State assessments in ELA and Reading are annual exams tied to graduation—students must meet a benchmark score on the 10th grade assessment, or subsequent retakes offered twice a year. The DIA’s are mandated district interim assessments, designed by the district reading staff using test bank questions to create a “mini” FSA. Comparative data analyses of student scores on the DIA and the FSA indicated that the DIA’s have a high level of predictability regarding the likelihood of parallel performance. The Vocabulary Size Measure Test (Nation, 2012), is a multiple choice test designed to measure receptive reading vocabulary, and provides an estimate of word families known. The teacher created curriculum-based pre and post-tests used for this data collection are text-specific assessments of text-based vocabulary in a multiple-choice format. These also included text-dependent, standards-based questions requiring written answers.
Analysis of Data

**FSA and FCAT data.** In the early years of the research project, we focused on year-end achievement test data to evaluate the overall success of our developing instructional approach. The initial research site, labeled School T, was a comprehensive sixth to twelfth grade middle-high school. The data chart illustrates the comparison of year-end scores with the project from 2008 until 2012, and without the project from 2013 until 2016. The percentage of 9th and 10th graders meeting the benchmark during the years of implementation from 2008-2012 increased for three years, with a noticeable dip in 2011 and 2012, giving a five-year average pass rate of 40.3 percent. In the four years since the project was discontinued, the average percentage of 9th graders meeting the benchmark has dropped steadily to an average pass rate of 32 percent. In 2010, the increase in the percentage of students passing the FCAT was eclipsed by an astonishing 71% gain on the Reading FCAT in our lowest quartile of students-- fully 20 percentage points above any other school in the district. Paradoxically, this success sharply reduced the number of students assigned to Intensive Reading, and resulted in the collapsing of faculty to a single reading teacher responsible for grades 9-12. This lack of staffing for 2011 and 2012 curtailed our efforts to follow the instructional design of the project, which may explain the drop in passing scores.
In the last four years, the project site has been a ninth through twelfth grade high school, labeled School D. The data chart illustrates the comparison of year end scores without the project from 2008 until 2012, and with the project from 2013 until 2016. The percentage of 9th and 10th graders meeting the benchmark during the years of implementation jumped 5 percentage points and remained steady for two years, then dropped for the last two years, giving us an average pass rate of 55.1 percent. In the five years prior to the project, the average percentage of 9th and 10th graders meeting the benchmark fluctuated to an average pass rate of 48.4 percent.

During the first year of project implementation at School D in 2013, global analysis of the year-end data from the Florida State Assessment in English Language Arts (used to evaluate achievement in reading) showed that our student gains in reading outstripped all other content area gains, with significant growth of low achieving students. What made this success unusual was the movement of our lowest performing students into the high performing quadrant

Historically we had seen incremental growth toward the benchmark of students in the lowest quartile, or had success moving ‘bubble kids’ from the cusp to the benchmark.
encouraged to think that this new growth pattern could be attributed in part to the instructional emphasis with striving readers on developing text-based word knowledge.

*Figure 6. FSA and FCAT Data.*

<table>
<thead>
<tr>
<th>Academic year</th>
<th>School</th>
<th>Assessment</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>SCHOOL D</td>
<td>FCAT</td>
<td>46</td>
</tr>
<tr>
<td>2009</td>
<td>SCHOOL D</td>
<td>FCAT</td>
<td>40</td>
</tr>
<tr>
<td>2010</td>
<td>SCHOOL D</td>
<td>FCAT</td>
<td>45</td>
</tr>
<tr>
<td>2011</td>
<td>SCHOOL D</td>
<td>FCAT</td>
<td>58.5</td>
</tr>
<tr>
<td>2012</td>
<td>SCHOOL D</td>
<td>FCAT</td>
<td>52.5</td>
</tr>
<tr>
<td>Average pass rate without project:</td>
<td></td>
<td></td>
<td><strong>48.4</strong></td>
</tr>
<tr>
<td>2013</td>
<td>SCHOOL D</td>
<td>FCAT</td>
<td>57.5</td>
</tr>
<tr>
<td>2014</td>
<td>SCHOOL D</td>
<td>FSA</td>
<td>57.5</td>
</tr>
<tr>
<td>2015</td>
<td>SCHOOL D</td>
<td>FSA</td>
<td>54.5</td>
</tr>
<tr>
<td>2016</td>
<td>SCHOOL D</td>
<td>FSA</td>
<td>53.5</td>
</tr>
<tr>
<td>Average pass rate with project:</td>
<td></td>
<td></td>
<td><strong>55.75</strong></td>
</tr>
</tbody>
</table>

**DIA data.** The District Interim Assessments were created by district personnel to parallel the challenges of the ELA FSA, and district level analysis of the two measures indicated a high level of reliability regarding DIA and FSA performance of individual students. 9th and 10th grade students sit for these assessments three times year, in their English Language Arts classes. The chart below illustrates the disaggregated DIA data for the 9th and 10th grade students enrolled in Intensive Reading classes:
There are three factors that limit the usefulness of the District Interim Assessments as a measure of performance. Each of the three annual DIA’s is designed to address a different set of Florida English Language Arts standards, so student performance cannot be effectively compared across administrations of the test during the same year. Again, the same standards are not necessarily tested at the same point of the year in following years. While these assessments are historically considered “reading tests”, the DIA’s are administered in the ELA rather than Intensive Reading classes, which complicates data collection, as there is limited ownership of the DIA results.

Data analysis shows uneven student performance, with scores somewhat randomly rising and falling. However, the one consistency within this data is the increase in all three annual scores in the 2014-15 9th grade cohort as 10th graders in 2015-16. This does suggest a beneficial longitudinal impact from the reading routines on student performance.

VST data. As mentioned earlier, in the early years of this project, we focused on year-end achievement test data to evaluate the overall success of our developing instructional approach. However, it became clear that we needed more timely and more explicit data to guide instruction and more closely determine “what worked”. We investigated various methods for determining overall vocabulary size (Anderson & Freebody, 1981; Cobb 2000-2015; (Ehsanzadeh, 2012; Nation, 2012; Marzban & Hadipour, 2012), with our ideal approach being to create a pre and
post assessment based on the specific corpus of academic words collected from the Core Word Lists. The technical demands of developing such an assessment proved beyond our capacity at the time, and led us to the Vocabulary Size Measure (VST), which uses random words selected from frequency bands to determine breadth of vocabulary, up to twenty thousand word families. Using this method, a one hundred word, multiple-choice test can determine the number of word families a student knows. While originally designed for English language learners, the assessment now has versions for monolingual speakers of English in pre and post-test formats.

We administered the VST to all the students in our 9th and 10th grade Intensive Reading classes at the beginning and end of each school year. By matching pre and post test scores, we were able to determine change in knowledge of word families. The effect size for both combined grades was 1.19. The following chart illustrates the pre and post-test VST scores for 9th grade in 2014-2015.

*Figure 8. 9th grade vocabulary measure.*

<table>
<thead>
<tr>
<th>9th Grade</th>
<th>Vocabulary Size Measure1 14K</th>
<th>Vocabulary Size Measure2 14K</th>
<th>Word Families Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Date Taken: 9/14</td>
<td>Date Taken: 5/15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total Students</td>
<td>Raw</td>
<td>Total Students</td>
</tr>
<tr>
<td>TOTAL</td>
<td>173</td>
<td>43.23</td>
<td>166</td>
</tr>
<tr>
<td>Economic Disadvantage</td>
<td>132</td>
<td>42.24</td>
<td>128</td>
</tr>
<tr>
<td>Black/African American</td>
<td>51</td>
<td>40.38</td>
<td>53</td>
</tr>
<tr>
<td>Hispanic</td>
<td>34</td>
<td>44.16</td>
<td>36</td>
</tr>
<tr>
<td>White</td>
<td>88</td>
<td>45.38</td>
<td>77</td>
</tr>
<tr>
<td>Female</td>
<td>87</td>
<td>44.34</td>
<td>84</td>
</tr>
<tr>
<td>Male</td>
<td>96</td>
<td>42.39</td>
<td>82</td>
</tr>
<tr>
<td>LEP</td>
<td>20</td>
<td>35.17</td>
<td>22</td>
</tr>
<tr>
<td>Special Ed Indicator</td>
<td>48</td>
<td>39.62</td>
<td>46</td>
</tr>
</tbody>
</table>

In 9th grade, we saw significant gains in word families in almost every subgroup, ranging from an increase of 364 word families among Hispanic students, to an increase of 2012 word families among Black/African American students.
families among African American students. The only subgroup to demonstrate a loss of word families was the LEP subgroup. The instructional approach we implemented, that is, a set of routines and text-specific vocabulary scaffolds to support striving adolescent readers with the complex texts of school, is intended to scaffold students from conversational language to academic language. It seems likely that the 9th grade LEP students were still acquiring basic English and did not yet have the language skills to acquire cognitive academic language proficiency in English.

The following chart illustrates the pre and post-test VST scores for 10th Grade in 2014-2015. In 10th grade, we saw significant gains in word families in every subgroup, ranging from an increase of 1046 word families among students with Special Education Indicators, an increase of 1498 word families among Hispanic students, an increase of 2278 word families in LEP students, and an increase of 2483 word families among African American students.

*Figure 9. 10th grade vocabulary measure.*

<table>
<thead>
<tr>
<th>10th Grade</th>
<th>Vocabulary Size Measure1 14K Date Taken: 9/14</th>
<th>Vocabulary Size Measure2 14K Date Taken: 5/15</th>
<th>Word Families Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Students</td>
<td>Raw Score</td>
<td>Total Students</td>
</tr>
<tr>
<td>TOTAL</td>
<td>171</td>
<td>39.79</td>
<td>167</td>
</tr>
<tr>
<td>Economic Disadvantage</td>
<td>88</td>
<td>43.78</td>
<td>87</td>
</tr>
<tr>
<td>Black/African American</td>
<td>62</td>
<td>34.25</td>
<td>61</td>
</tr>
<tr>
<td>Hispanic</td>
<td>39</td>
<td>40.1</td>
<td>38</td>
</tr>
<tr>
<td>White</td>
<td>70</td>
<td>44.43</td>
<td>68</td>
</tr>
<tr>
<td>Female</td>
<td>82</td>
<td>41.98</td>
<td>80</td>
</tr>
<tr>
<td>Male</td>
<td>89</td>
<td>40.55</td>
<td>87</td>
</tr>
<tr>
<td>LEP</td>
<td>18</td>
<td>35.57</td>
<td>18</td>
</tr>
<tr>
<td>Special Ed Indicator</td>
<td>30</td>
<td>37.67</td>
<td>31</td>
</tr>
</tbody>
</table>

The following chart shows the pre and post-test scores for 9th grade 2015-2016. Again, we saw significant gains in word families in every subgroup, ranging from an increase of 602
word families among Hispanic students to an increase of 1947 word families among African American students.

*Figure 10. 9th grade vocabulary measure.*

<table>
<thead>
<tr>
<th>9th Grade</th>
<th>Vocabulary Size Measure1 14K Date Taken: 9/15</th>
<th>Vocabulary Size Measure2 14K Date Taken: 5/16</th>
<th>Word Families Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Students</td>
<td>Raw Score</td>
<td>Total Students</td>
</tr>
<tr>
<td>TOTAL</td>
<td>175</td>
<td>41.42</td>
<td>164</td>
</tr>
<tr>
<td>Economic Disadvantage</td>
<td>143</td>
<td>39.98</td>
<td>139</td>
</tr>
<tr>
<td>Black/African American</td>
<td>56</td>
<td>41.65</td>
<td>53</td>
</tr>
<tr>
<td>Hispanic</td>
<td>37</td>
<td>43.2</td>
<td>32</td>
</tr>
<tr>
<td>White</td>
<td>82</td>
<td>44.06</td>
<td>79</td>
</tr>
<tr>
<td>Female</td>
<td>79</td>
<td>45.45</td>
<td>72</td>
</tr>
<tr>
<td>Male</td>
<td>96</td>
<td>42.44</td>
<td>92</td>
</tr>
<tr>
<td>LEP</td>
<td>20</td>
<td>39.75</td>
<td>16</td>
</tr>
<tr>
<td>Special Ed Indicator</td>
<td>41</td>
<td>34.85</td>
<td>39</td>
</tr>
</tbody>
</table>

This final VST chart shows a similar pattern of growth for the 10th grade in 2015-16, ranging from an increase of 576 word families among LEP students to an increase of 1587 word families among Economically Disadvantaged students. However, there are several other highly significant gains. In each year-end administration, the gains made by African American students consistently outstripped the gains of almost every other group, an outcome that suggests that bi-
dialectic students benefit significantly from this language focused approach to reading. The other
powerful gain is not within the grade year, but again, within the 2014-15, 9th grade cohort as 10th
graders in 2015-16. Every subgroup in the 9th grade cohort made additional gains in the second
year of data collection—as 10th graders. This data suggests that the effects of participation in the
language-scaffolded instructional approach had a positive longitudinal effect.

Figure 11. 10th grade vocabulary measure.

<table>
<thead>
<tr>
<th>10th Grade</th>
<th>Vocabulary Size Measure1 14K Date Taken: 9/15</th>
<th>Vocabulary Size Measure2 14K Date Taken: 5/16</th>
<th>Word Families Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>Total Students: 145 Raw Score: 44.71</td>
<td>Total Students: 140 Raw Score: 55.03</td>
<td>1032</td>
</tr>
<tr>
<td>Economic Disadvantage</td>
<td>Economic Disadvantage Students: 133 Raw Score: 43.53</td>
<td>Economic Disadvantage Students: 135 Raw Score: 58.7</td>
<td>1517</td>
</tr>
<tr>
<td>Black/African American</td>
<td>Black/African American Students: 46 Raw Score: 48.7</td>
<td>Black/African American Students: 46 Raw Score: 61.57</td>
<td>1287</td>
</tr>
<tr>
<td>Hispanic</td>
<td>Hispanic Students: 36 Raw Score: 40.78</td>
<td>Hispanic Students: 32 Raw Score: 52.88</td>
<td>1210</td>
</tr>
<tr>
<td>White</td>
<td>White Students: 63 Raw Score: 48.9</td>
<td>White Students: 62 Raw Score: 57.19</td>
<td>829</td>
</tr>
<tr>
<td>Female</td>
<td>Female Students: 69 Raw Score: 52.45</td>
<td>Female Students: 67 Raw Score: 59.44</td>
<td>699</td>
</tr>
<tr>
<td>Male</td>
<td>Male Students: 76 Raw Score: 49.04</td>
<td>Male Students: 73 Raw Score: 58.68</td>
<td>964</td>
</tr>
<tr>
<td>LEP</td>
<td>LEP Students: 15 Raw Score: 36.57</td>
<td>LEP Students: 11 Raw Score: 42.33</td>
<td>576</td>
</tr>
<tr>
<td>Special Ed Indicator</td>
<td>Special Ed Indicator Students: 32 Raw Score: 37.76</td>
<td>Special Ed Indicator Students: 31 Raw Score: 49.45</td>
<td>1169</td>
</tr>
</tbody>
</table>

Teacher and coach created text-based vocabulary tests. We created mini versions of the
corpus approach to vocabulary assessment by creating a multiple-choice test using the Core
Word List, which we administered before and after implementing the reading routines. Each pre
and post-test consisted of 30 words from the Core Word List for the specific text under study.

Two exemplar texts illustrate the effect sizes of the reading routines on vocabulary acquisition:
the first a selection from the assigned textbook for 9th grade Intensive Reading, “Hip Hop as
Culture” (Smith, 2006), the second an excerpt from “Letter from Birmingham Jail” (King, 1963),
which we used as a stretch text in 10th grade Intensive Reading. In both cases the effect sizes are
significant: 1.13 for “Hip Hop as Culture,” and 2.71 for “Letter from Birmingham Jail”. The
difference in effect size is a function of the difference in the language complexity of the two
texts. Due to the limited complexity of the language of “Hip Hop in Culture”, students had moderately high pre-test scores on the selection. Therefore, even though they scored well on the post-test, the difference between the pre and post scores, while resulting in a significant effect size, was relatively small. Due to the high complexity of language of a “Letter from Birmingham Jail,” students had low pre-test scores; after instruction in the reading routines, they scored very well on the post-test, which resulted in the remarkable effect size of 2.71.

**Discussion**

The two goals of this project were to implement the text-embedded instructional routines and materials we developed to increase vocabulary acquisition and reading comprehension with striving adolescent readers, and to test their effectiveness with our secondary level word-weak students. To determine this we asked five questions in our review of the data:

- Were the explicit instructional routines easily replicated?
- Did we “push the river” of academic language proficiency beyond the canon of vocabulary acquisition which suggests a maximum acquisition of 15-20 words a week, for both ELL’s and English Only students?
- Did the interactive reading with peers create the conditions for the sustained engagement with text necessary of language and literacy development?
- Did student implementation of the instructional routines with embedded word meanings in the text to increase both vocabulary acquisition and text comprehension?
- Did students demonstrate increased academic language proficiency across all, four language domains?

The instructional routines did become concrete practices easily replicated by multiple teachers, which I observed in modeling and co-teaching. However, consistency of implementation was not always observed. Some teachers implemented the routines with fidelity each time they introduced a new text, and regularly evaluated student mastery of the target vocabulary. Some teachers implemented only the teacher-directed routines, and one teacher
provided students with Core Word Lists for independent reading of texts, but did not explicitly teach or implement the routines.

Student participation in reading routines clearly increased academic vocabulary as indicated by multiple measures. The post-test scores on the VST showed remarkable gains in word families, well beyond any notions of ten or even twenty words a week. The outcome of the curriculum-based tests gave further support to the positive impact of implementing text-specific language scaffolds, where the complexity of the text provided a medium, rather than a barrier, for vocabulary acquisition. Even more encouraging is the data indicating greatest gains for African American and economically disadvantaged students, for whom initial language measures lagged significantly behind their grade level peers.

When the interactive reading routines were consistently implemented, they clearly contributed to creating classroom environments with high level of student autonomy, incorporating those elements that have been identified to contribute to increased student motivation—of ownership, self-efficacy, collaboration, social interaction with peers, and expectation of mastery (Dyson, A. H; 1993; McRae, A., & Guthrie, J.T., 2009). In those classrooms, once students had mastered the routines, they were self-directed (in small groups and pairs) for the majority of instruction, with the teacher largely operating as guide and facilitator. The impact of sustained self-directed practice was notable on improved student behavior and self-confidence.

Providing students with explicit reading routines and language scaffolds for complex text facilitated collaboration among unlike and typically unlikely student pairs. Students fairly willingly participated in shared reading activities with students we teachers recognized as significantly more or less skilled, a fact obscured to their peers by the frontloading of literacy tasks with pre-reading routines, and the availability of core word lists to scaffold text reading.
Every year I anticipate that some students will refuse to participate in the initial instruction of reading routines. It never happens. When given explicit rules for participation, the challenge of reading complex text, and provided with vocabulary scaffolds, sustained student engagement has been the consistent norm.

Teacher observation of participation in classroom discussions and projects, and informal student interviews strongly indicated to us that students had increased text comprehension. Scores on the DIA give some indication that students did improve in text comprehension measures, particularly the longitudinal data looking at the cohort performance of 9th graders at the end of their 10th grade year.

Observations of student interactions in class discussions as well as in writing to text gave us additional indicators of increased text comprehension. The rubric we used to evaluate writing included specific expectations for language use, including demonstrating an understanding of the author’s words, restating the meaning of the text as part of the answer, and correctly using the target vocabulary of the text: the author’s words. These expectations could fail to correctly identify text comprehension if a student correctly answered the question, but did not demonstrate the required academic language mastery in his answer. When we shared writing samples with a teacher in the International Baccalaureate program she commented that she did not think her own IB students could write as eloquently as many of our student samples.

The kinds of growth that I find the most exciting, however, are not so easily revealed by quantitative data, and I’d like to share an anecdote to illustrate how exponentially increased word knowledge impacts literacy behaviors. Developmental reading curricula are grounded in metacognitive theory, and the belief that the reading comprehension of striving adolescent and adult readers can be effectively scaffolded by direct instruction of comprehension strategies. For example, the Teacher’s Edition of the standard curriculum for our Intensive Reading classes
identifies specific literary elements and strategies for each literature cluster, with “questions to prompt strategy application” printed in the margins of the student texts, cueing students to summarize, infer, question, and monitor comprehension (Harvey, S & Goudvis, A., 2000; Moore, D., Short, D.J., Smith, W. & Tatum, A., 2009). My observations of students’ informal daily interactions reveal that they are already masters of these strategies, as they summarize the plot of the movie they saw last night in the few minutes between classes, infer who didn’t make the basketball team with a glance at the body language of the athletes exiting the gym, pointedly question a best friend’s claim that her prom dress is the best, lip-sync the slow dance lyrics of a music video, and reread the latest text from the cute boy or girl from biology class. It’s not ignorance of summarizing, inferencing, questioning, slow reading, fast reading, and rereading the text (Newkirk, 2009), that confounds text comprehension for striving readers—it’s the incomprehensibility of the very words of the text. What we consistently observe, is that when the language of complex text is supported with specific vocabulary scaffolds—when the text is comprehensible—striving readers are then able to seamlessly apply these cognitive strategies, transacting with the text in a reflective and insightful manner not so different from students sitting in AP and IB classrooms on the other side of campus. Responding to Mair’s (1986) essay On Being a Cripple, an Intensive Reading student whom I had never previously observed to participate actively in class, made this comment (which I can only reconstruct from memory as I was too stunned by his voluntary participation to take field notes):

“You know how she say it take the same hopefulness that changed countries from…” (He paged through the text to find the sentence and read it out loud):

‘…"undeveloped" to "underdeveloped," then to "less developed," and finally to "developing" nations. People have continued to starve in those countries during the shift…” (Mairs, 1986 p.1)

It’s like you can call me African American, but if I got to go home to Spring Hill, [a local
TEXT-BASED TOOLS

I’m still just a n_ _ _ _er.”

Conclusions/ Instructional Implications

The most common feedback I receive from teachers learning about and implementing this approach is, “finally, something that works! We know our kids don’t know these words, but this is the first time we’ve seen anything that we can actually use.” The extensive vocabulary scaffolds are not a panacea to reading difficulties, but they are a powerful tool for allowing striving readers access to school texts, and in supporting their literacy endeavors in listening, speaking, and writing to text. The routines and materials directly correspond to the recursive dilemma facing our word-weak students, of learning academic vocabulary to read complex text, and reading complex text to learn academic vocabulary.

“...text comprehension depends heavily on detailed knowledge of most of the words in a text. However, it is also clear that the words that occur in texts are mainly available for learning in texts themselves” (Cobb 2007, p1).
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Vocabulary Size Test, Version A, 