

Fenice B. Boyd¹ / Monica L. Ridgeway² / Tiffany M. Nyachae³

“Is There Lead in My Water?”: Employing a Culturally Compelling Instructional Perspective to Teach for Change

¹ University of South Carolina, Columbia, SC 29208, USA, E-mail: boydfb@mailbox.sc.edu

² Vanderbilt University, Nashville, TN 37235, USA, E-mail: m.ridgeway@vanderbilt.edu

³ SUNY Buffalo State College, Buffalo, NY 14222, United States of America, E-mail: nyachatm@buffalostate.edu

Abstract:

In this paper we build a conceptual framework to argue for culturally compelling instruction that leads to teaching for change. Culturally compelling instruction calls for a substantive shift in how teachers view their students, communities, and what the perspective might mean for students' future when they have access to alternative learning opportunities. The framework encourages teachers to take a stance and assume responsibility and ownership for their own decisions about the curriculum and instructional delivery. Most prominent is to acquire a depth of understanding of their students' identities and needs. To represent our vision for culturally compelling instruction we use the lead poisoned water crisis in Flint, Michigan, USA as an illustrative case. Our work provides an example of how a real-world circumstance such as Flint's may be integrated into content area subjects to frame a culturally compelling instructional practice.

Keywords: literacy, culturally-compelling-instruction, African-American-children, contaminated-water, Flint

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Introduction

Almost ten years ago the Common Core State Standards (National Governors Association Center for Best Practices, Council of Chief State School Officers, 2010) became the status quo for reading and writing instruction—or otherwise what might be perceived as the *gold standard* (italicized for emphasis) for literacy teaching and learning. Initially adopted by 44 states and the District of Columbia, upon close examination and analysis, one would be challenged to find reading and writing Standards that promote strategies for reading texts critically; media texts and multimodal approaches to teaching and learning are virtually non-existent. What is more, the majority of literature in the Common Core State Standard's (CCSS) exemplars are from “the canon” thus, excluding a plethora of high quality contemporary and multicultural literature written by and about people who come from diverse races, ethnicities, and cultures (Boyd, 2012/2013).

To address the limitations of the CCSS, teachers might embody culturally compelling instruction and take a stance that: a) challenges the status quo of reading and writing instruction by using curriculum materials and instructional approaches that offer alternative points of view beyond mandates, and b) call into question the status quo of teaching and learning mandates when they are not relevant to students and their community. One way that teachers might raise questions and address such limitations is through dialogue and inquiry on real world issues that flood the news and media on a daily basis. For instance, we used the water supply crisis in Flint, MI as a case to raise children's awareness of how a city's water system—whose majority of its residents happen to be African American—was intentionally poisoned through systemic racism sanctioned by the state government (e.g., New York Times, 2016 http://www.nytimes.com/2016/01/22/us/a-question-of-environmental-racism-in-flint.html?_r=0). Little work has been done on the “intellectual labor that teachers perform (or might perform) as they develop and enact inclusive curricula and pedagogies while simultaneously adapting these to the cognitive, emotional, and political-evaluative capacities of their students” (Kelly & Brooks, 2009, p. 203). Still, little research exists on the deliberating of controversial public issues in lower grades (Camicia & Dobson, 2010).

We assert that teaching children about themselves and their communities enacts a sense of teaching for social justice and change. It is also culturally responsive (Au, 2011; Gay, 2010), relevant (Ladson-Billings, 1995 and 2014), and sustaining (Paris, 2012; Paris & Alim, 2014), “giving students significant ownership of their learning

Fenice B. Boyd is the corresponding author.

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[beyond] tokenistic ways” (Smyth, 2012, p. 15). Haag and Compton (2015) reflect on a year in an English as Second Language (ESL) classroom, and argue how important it was to stay student-centered, and to continuously question and reflect on practice in order to help students negotiate their own learning through multiple learning opportunities. Boyd et al. (2006) argue, “Teaching is a political act, and in our preparation of future teachers and citizens, teachers and teacher educators need to be advocates for and models of social justice and equity” (p. 332), while Banks (2006) states, “An equity pedagogy exists when teachers modify their teaching in ways that will facilitate the academic achievement of students from diverse backgrounds” (p. 148). When teachers choose to include students’ cultural, ethnic and linguistic backgrounds and experiences in the curriculum, they are choosing to help close the *opportunity gaps* (Hilliard, 2003; Milner IV, 2015) faced by many children. Moreover, students’ voices must be heard in order to forge an empowering critical pedagogy (Ardizzone, 2006) and to promote authentic and effective learning environments (Haag & Compton, 2015).

We believe that real change comes from within, where teachers and students are constantly developing a social awareness and consideration of others, and often gain a critical consciousness to think about ways to disrupt and change the patterns of oppression (Adams, 2016; Bell, 2016; Camicia & Dobson, 2010; 2016; Ridgeway & Yerrick, 2018). To combat injustice and oppression it is essential to understand the ways in which these concepts operate both at the macro (institutional) and micro (individual) levels (Adams, 2016; Bell, 2016; Dimick, 2012). For instance, schools are structured such that students—from kindergarten through 12th grade—are placed in academic tracks (Oakes, 1985) that reproduce social inequality which often limits equal access to variable opportunities. Likewise, society assigns roles to people based on their educational level(s), socioeconomic class, race, ethnic and cultural backgrounds, primary and secondary discourses (Gee, 19xx), and historical, social, and political ideologies. We assert that these conditions need and should change, and in order for change to occur teachers might take a proactive role by enabling children to engage in critical learning opportunities about themselves and their community (Hinchman & Boyd, 2015). In the next section, we provide an overview of culturally compelling instruction—a conceptual framework we use to discuss our vision for this framework, as well as examples of our work with children to investigate water quality.

A culturally compelling instructional framework

We employed a culturally compelling instructional approach (Hinchman & Boyd, 2015) to raise children’s awareness of how race and racism impacts the basic human rights of a group of people, such as access to clean water. Drawing on Ladson-Billings’ (1995) theory of culturally relevant pedagogy, Paris (2012) explained that culturally sustaining pedagogy “supports the value of our multiethnic and multilingual present and future” and

requires that our pedagogies be more than responsive of, or relevant to the cultural experiences and practices of young people—it requires that they support young people in sustaining the cultural and linguistic competence of their communities while simultaneously offering access to dominant cultural competence (p. 95).

Hinchman and Boyd (2015) adapted and modified Paris’ (2012) notion of culturally sustaining pedagogy to theorize what they call culturally compelling instruction that centers on

using pedagogical resources that are anchored in students’ funds of knowledge, their understanding of local community discourses, and their linguistic and cultural experiences and interests ... [it] extends students’ perspectives by drawing on important stories and perspectives from an array of cultures—rich narratives and ideas that are so compelling they resonate with students regardless of backgrounds (p. 265).

A culturally compelling instructional framework positions teachers and students as autonomous and they are empowered to assume ownership of the curriculum, pedagogy and pedagogical approaches to foster multiple pathways to meaningful teaching and learning. When a sense of empowerment is promoted we can then encourage and foster the teaching profession to take on real world social concerns—such as contaminated water systems—in communities where students live (McMillon & McMillon, 2015). In turn, classrooms can become sites where all students—regardless of race, gender, socioeconomic class, and religion—can embrace the learning process where their voices are heard by teachers, peers, and members of the community (Haag & Compton, 2015). Au (2011) states, [...] “if we wish to close the literacy achievement gap, we must take seriously the notion of building on the strengths that students of diverse cultural and linguistic backgrounds bring with them from the home [...]” (p. 51), and Moll, Amanti, Neff, and Gonzalez (1992) assert students’ “funds of knowledge” play an essential role and importance in their personal, cultural, and communal knowledge when designing

learning activities. These scholars' notion of teaching and learning are in contrast to the call for curriculum and materials designed to teach to the CCSS and to existing patterns, found in many schools where teaching according to conventional methods—based on mainstream ideologies—do not apply to a large majority of students from diverse ethnic, cultural, and linguistic backgrounds.

In the remainder of our paper we present the lessons we learned as illustrative of a vision for culturally compelling instruction that may lead to judicious teaching and learning about topics relevant to the lives of children. We begin with the community context followed by examples of lessons focused on examining issues related to water quality.

Community context

The setting for our work was a summer youth camp at Norlina Community Center (NCC). Norlina is an old industrial city in the northeast, and the building is located in the middle of a large housing development. The residents are predominantly African American, and the community center provides a wide range of services for them including a food pantry, job training, activities for seniors, and a Head Start program for young children. The majority of staff members are African American who also live in the community. Every summer NCC offers a free full-day camp for the children. We learned from one staff member that limited advertising is done because within two days they are at full capacity.

Organizing the summer camp is no small feat. To ensure that the children have a rewarding experience, the staff plan academic, as well as hands-on practical activities such as field trips to local college campuses and museums. Additionally, the center employs and mentors high school aged youth who live in the community. Together, the staff and high school youth work collaboratively to best support the children. The care by the NCC staff that we observed aligns with Gay's (2010) assertion:

This kind of caring is one of the major pillars of culturally responsive pedagogy for ethnically diverse students. It is manifested in the form of teacher attitudes, expectations, and behaviors about students' human value, intellectual capacity, and performance responsibilities. Teachers demonstrate caring for children as *students* and as *people* (p. 45) (italics in original).

For two weeks, we worked with children ages 9–11.

Beginning a culturally compelling instructional approach

We started our study of water quality by using an informational text retrieved from the National Institute of Environmental Health Sciences' website titled, "Lead Poisoning." With the article in hand, the children follow along as Monica (second author) reads it aloud. As she reads she also thinks aloud about various points to better promote the children's understanding about the content. For instance, the article notes that lead is a heavy metal and basic chemical element. Monica explains that we take vitamins and minerals because our body needs these nutrients. She says, "To function and stay healthy, our body needs some metals such as iron, while others such as lead should not be consumed into our bodies because lead is poison and can make us very sick." As Monica reads the children raise issues that reveals shock from their childhood perspective. We offer the following vignette as an example of an exchange between the children and Monica that demonstrates their interactions:

"They are tryin' to kill us!" Jamaal shouted. "It [article] said lead can be in soil, our school water, toys, anything!" Toni shouted. "Why do we even use lead pipes when they can poison the water?" asked Averick. Monica always gave each child affirmation with a nonverbal gesture or verbal response. When the children would react to the text unexpectedly she would pause from reading, engage in brief dialogue, or give the children time to finish their exchanges. After reading that houses built prior to 1977 could contain lead paint she asked the students to tell her what they were thinking. Samuel stated, "They need to knock all these old houses down!" As Monica continued with this lively interactive read-aloud and discussion, she paused to engage the children in an exercise to demonstrate how many children are affected by lead contamination nationally: "Children in the United States between the ages of one to five have elevated blood levels, and more than one-fifth of African American children living in houses built before 1946 have elevated blood lead levels. I want each one of you to count one, two, three, four, five until everyone has counted." After everyone had counted, Monica said, "Now I want each five to stand up. Now look around this room. Everyone who is standing is visually representing African American children. You are the only

racial/ethnic group mentioned in the document, and the students standing represent the number of children who would be contaminated by lead.

Topics of environmental racism are not typically the goal and purpose of lessons for upper elementary grade students, especially if they are members of historically marginalized and underserved populations. The read-aloud coupled with students standing up was intentional so that they might personalize the text, and critically think about why they are the only ethnic group identified in the article.

After the read-aloud, Monica and Fenice (first author) show the children a short video about Flint Michigan's water supply crisis. The video provides excerpts about how the city's water system became contaminated with lead. The children use a response sheet to generate notes while they watch the video. At the conclusion of the video, they work in small groups to share ideas, and write down additional thoughts. The video response sheet included four broad prompts:

- *That's New to Me*: Student captures new information learned from the video
- *I Agree or Disagree*: Student states opinion about information presented in video
- *Questions I Still Have*: Student shares areas she or he found confusing, or questions about which she or he still wonders
- *Links Back to Me*: Student makes a personal connection to content of video

To set the stage we encouraged the children to engage in an interactive discussion as they asked critical questions. The response sheets were useful for the children to use as a reference in their discussions with each other. Students were able to share their empathy and frustrations about the Flint water crisis. Equally important, the children queried their peers about how such a travesty could happen in Flint and wondered if their city was at risk of lead poisoning based on the similarities between the cities.

Every activity encouraged these African American children to connect personally to the text and activities. We postulate, the connecting of literacy, water quality, lead contamination, and Flint, MI positioned them as knowledgeable members of their own community who could discuss current events, ask critical questions about their own context so as to engage as active members of society. We suggest that as previously revealed in the vignette, the children would not have had such deep connections without purposeful scaffolding. Next, we provide portraits of other activities.

Developing a culturally compelling teaching and learning environment

Another activity involved assisting the children to activate cultural knowledge about their own uses of water. Fenice facilitated this by employing K-W-L (Ogle, 1986) as an instructional strategy. She invites the children to share what they already know about water (K) and what they wanted to learn (W) as they read and discuss articles, watch relevant videos, and engage in various hands-on activities and discussions throughout the lessons. Fenice explains that at the conclusion of each discussion, reading, and video, they will revisit what they learned (L) to add information to the K-W-L chart. In the following sections, we present how we: a) explored students' lived experiences, b) challenged misperceptions about lead, and c) tested water brought from their homes.

Scaffolding learning to enable children to reflect on lived experiences

As Fenice places the giant post-it notes on walls around the classroom, there is happy chatter in the air. Monica has filled small plastic cups of water and placed one on each child's desk. Some sit looking at the cups curiously while waiting to see what is in store for the first activity. Suddenly, Fenice speaks with a commanding but pleasant voice: "All eyes on me"! And the chatter immediately subsides. "We're going to do an activity called K-W-L because I want to know what you think about some things." After Fenice explains what each letter means she says, "Let's think about what we already know about water." Initially, the children struggle to come up with ideas. Jamie blurts out "water cycle" and Fenice ask Jamie to explain what he means by encouraging him to be specific. "So, tell me what you mean by water cycle?" Jamie follows up by saying that water evaporates. As the children struggle to share what they know about water, Monica reminds them that they can use the container of water in front of them to think about what they know. After this prompt, the classroom immediately erupts with overlapping chatter. "Water forms the shape of the container." "If we don't drink water we will get dehydrated." "It's healthy." "It's made of hydrogen and oxygen." "It evaporates." Fenice states, "You're using big words like

hydrogen and dehydrated. That's very good!" As the children continue to shout out what they know, and raise questions that address what they want to learn, Fenice voraciously writes them down.

In this example, we convey one way in which we set the tone for students to freely contribute their thoughts. Using K-W-L to elicit students' prior knowledge, we are not looking for any one right answer, but rather, what the children know about a necessary resource they use on a daily basis. While facilitating the group discussion, we notice that the children began talking to each other when someone raised an interesting idea. For example, when Jayla stated that she wanted to know (W) if the body is comprised of 75% water, Pamela turned and asked her how she came up with 75%. This exchange demonstrates that Pamela was listening to Jayla and that they connected through a sense of curiosity. It is moments like these where teachers might embrace student dialogue that may not appear to be a part of their agenda, yet relevant within the context. Figure 1 is the K-W-L chart that the children generated across multiple lessons over a two-week period.

K (What Do I Know)	W (What I Want to Know)	L (What Did I Learn)
<ul style="list-style-type: none"> •Water evaporates •It's a liquid •Can become a solid like ice •It bubbles when it boils •We'll become dehydrated if we don't drink water •We use water to shower, wash our hair, wash dishes •Water is made of hydrogen and oxygen •Water evaporates 	<ul style="list-style-type: none"> •Does water contain chemicals? •What is water so important? •How does water make you stay healthy? •How do you know when lead is in your water? •How does lead get in our water? •What is lead made of? Where does it come from? 	<ul style="list-style-type: none"> •Lead can be in water, toys, soil •Lead can be in school water •It's a chemical •If you cook with contaminated water it can harm our food •We don't know if lead is there unless we test it •Lead can be dangerous if it gets in our body •It's to have a little chlorine in your water to kill germs

Figure 1: Children's ideas generated during K-W-L activity.

To foster an inclusive learning environment all of the children had an opportunity to contribute their thoughts and experiences. The discussion around water, using K-W-L as the guiding framework provided a structure to activate their prior knowledge, and describe everything they could think of before moving into the focus on lead as a contaminant. Our facilitation for building content enabled the children to personally connect.

In this case, potentially, students would not have been able to make a personal connection to the water supply crisis in Flint, MI had we not scaffolded so that they could explore their personal realities (if they are affected by the situation), and ultimately connecting the issue or dilemma to the larger societal system; in this case, their own community. Open classroom discussions are more likely to evoke a more cogent story of students' reasoning, pertinent knowledge, and background experiences. As noted by Tharp and Gallimore (1988) instructional conversations can be a fruitful way for teachers to learn about the intellectual resources that children from diverse backgrounds bring to the classroom. Further, instructional conversations can be advantageous (and reciprocal) for teachers and students; teachers learn about their students' identities and students learn more about each other. In the next section, we describe the pedagogical framework we created so that the children could test water they brought from home.

Challenging misperceptions about lead

Culturally compelling instruction calls for purposely making content relevant to the children by providing them with multiple opportunities to share their own stories and perspectives. As noted by Adams (2016), "Learning is most powerful when it is relevant" (p.42). Providing the children with access to engaging literacy learning activities to make connections to their home lives, as stated earlier, we implemented a real-world issue to practice this tenet by using Flint, Michigan's water supply crisis as a case. To set the stage for testing tap water, we asked the children if they had heard of lead and four students raised their hands. Letisha stated, "My bus aide told my cousin to stop poking me with a pencil because of lead." We recognized that Letisha's bus aide actually had a common misunderstanding about lead being in pencils so, Monica explained that another element called graphite is the mineral actually used for the stylus portion of pencils. When graphite was discovered it was referred to as black lead, but it actually does not contain lead at all (Retrieved from: www.todayifoundout.com/index.php/2010/11/why-pencil-lead-is-called-lead/). "However, lead was in pencils until the middle of the twentieth century, which was a long, long, long time ago, even before I was born!" she says with a smile. "So, in the past pencils were a source of lead poison when people would ingest the paint by chewing on the pencil." Toni shared that she remembered when her mother had her tested for lead.

Testing water quality with students

This section describes the children's experience in testing the quality of water they brought from home. To enhance their learning experience, we purchased two water-testing kits. One kit tested for pH, chlorine, iodine, copper and hardness or softness of water, and the second kit tested for lead only. All of the water testing was conducted during one class session.

The children worked in groups of two to three, and each was given a think sheet to record the results of the water quality. If a child forgot to bring water from home, she or he participated in the activity by assisting in the testing of the water quality with a teammate, so as not to draw attention to the child for not bringing in water as assigned. We provide a sample report generated by six children in Figure 2.

Children	pH	Chlorine	Iron	Copper	Hard or Soft Water
Toni	8	Yes	No	Yes	Soft
Jamaal	8	Yes	No	No	Soft
Brandon	7	Yes	No	Yes	Soft
Jasmine	6	Yes	No	No	Soft
Averick	7	No	No	No	Soft
Jayla	7	No	No	No	Soft

Figure 2: Sample results from children's water quality reports.

The water quality report included three questions that gave the children an opportunity to interpret the results: (1) Did you find something in your water that you did not expect? What? (2) Did you expect to find something in your water that you did not find after all? What? (3) What made you think it was there? (Example: colored stains, smells, etc.). Jasmine answered all three questions. For question one, she wrote, "Yes, because I didn't know I had a little bit of [chlorine] in my tap water." Jasmine went on to say the color was what made her think the chlorine was there. Brandon wrote that he found copper in the water he brought from home, and he did not expect to find this element. In his report, Brandon noted that the color of the water turned when he tested it and that was what made him think copper was in his tap water. As a final example, Jamaal said he expected to find iron in his tap water but was surprised that there was none. Although the level was low, Jamaal wrote that he did expect to find chlorine in his tap water.

When it was time to test for lead the children, Fenice and Monica were all eager to learn what the results would convey. The children wanted to know, "Is there lead in my water?" Monica explained that there was one lead test that the class would conduct on only one water sample: "We have to think about whose water we should test?" She facilitated another energetic discussion that drew upon students' knowledge along with their reasoning. For example, the children asked from where the water samples came, of which most were from the housing complex that was a relatively new building not far from Norlina Community Center. Two samples came from the houses that were in an older section of Norlina. Based on what they learned from the National Institute of Environmental Health Sciences' article, and from the information they gathered from each other, the children agreed the one water sample tested should be Alana's or Jewel's. Monica asked both girls to write their names on a post-it note then folded it. She had a third student draw a name and Alana's name was drawn. As Monica read the water testing kit directions aloud to the class, the children leaned forward, listening intently. Monica prepared the sample and inserted the lead testing strip. It would take ten minutes before the results were ready. While waiting, the children stood in a circle and tossed around a ball and shared what they learned as they anxiously waited for the water test to process.

When the sample was ready, they huddled around Monica to read the results as she pulled out the testing strip; "There is no lead in this water. The test reads negative!" and the children sighed with relief. Through this activity the children were able to personally connect to the topic of water contamination, by testing water from their own community.

Bringing it all together

As stated at the beginning of this article we used the water crisis in Flint, MI as a case study of a unit on water contamination. We made Flint's case relevant by discussing water in general, reading and watching videos about water contamination, and finally testing the children's water they brought from home. Our final activity was to provide the children with an opportunity to synthesize what they learned in a culminating activity by designing a poster. The purpose of the poster was to present what they learned about water to the Mayor and the Norlina City Council. The children would later request a meeting with these elected public officials to tell

Moreover, culturally compelling instruction offers an opportunity to design an engaging curriculum and pedagogical approach. Current events can be developed in an interdisciplinary manner to strengthen relevancy to subject areas and content knowledge. Teachers can design projects to meaningfully engage children in making connections to events that are important to their lives and community. The study of lead in water, using Flint, Michigan's water supply crisis as a case study afforded us an occasion to delve into a topic, and to use instructional strategies, to enhance students' reading, writing, speaking, listening, and thinking skills in literacy and science. Through scaffolding, students gathered data (i.e., water tests), made predictions, and connected to science content in relevant and valid ways.

As we completed a draft of this paper in September 2016 Flint's water crisis was still unfolding. In fact, there were news reports about lead in water in our own neighboring communities. There is no real beginning, middle, and end to this event. The case we used to design a culturally compelling instructional approach involved a real event with real people. While the planning process may feel laborious the gain for the children with whom we worked was memorable to them, the NCC staff, and us. The children's awareness about lead in water was enhanced, and they wanted justice for Flint's community. A culturally compelling instructional pedagogy should go beyond informing children of events, to providing them with a platform to have a voice and respond accordingly.

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