

“Don’t You Know Only White Kids Like Science?”:
Currere as Critical Autobiography

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Abstract

Assessment results demonstrate a persistent achievement gap in science between Black, Latino, and Aboriginal students and their Caucasian peers. While curriculum documents espouse a *Science for All* slogan, little guidance is provided on the pedagogical actions that teachers can take to improve the teaching and learning of science for all students. This critical autobiography mobilizes the transformational potential of William Pinar’s method of “currere” as self-study. My review of the literature indicates scant evidence of currere’s conceptual and theoretical use by teacher educators who are preparing pre-service teachers. In this article, I employ currere as a means of self-reflection from my position as a teacher educator and Ph.D. student at the Ontario Institute for Studies in Education (OISE) of the University of Toronto. I document and analyze my efforts to navigate within and through the regressive, progressive, analytical, and synthetic moments as espoused by Pinar. Ultimately, currere enables me to unleash fresh ways of conceptualizing a preservice science methods course with a social justice focus.

Introduction

William Pinar first introduced the notion of “currere” in a paper he presented at the 1975 annual meeting of the American Educational Research Association. Currere, the Latin denotation of curriculum, which means the running of a course, is a method through which one “can sketch the relations among school knowledge, life history, and intellectual development in ways that might function transformatively” (Pinar, Reynolds, Slattery, & Taubman, 1995, p. 515). Pinar’s conception of currere sharply contrasted with the dominant techno-rational discourse of the field at that time (Flinders & Thornton, 2012). Unlike the field’s hegemonic focus on social efficiency (e.g. Tyler, 1949), Pinar proposed a series of “complicated conversation[s] with oneself . . . an ongoing project of self-understanding in which one becomes mobilized for engaged pedagogical action” (Pinar, 2004, p. 35).

Pinar’s groundbreaking reconceptualization of curriculum moves beyond academic objectives and outcomes to include one’s existential history since, he argues that, autobiography plays an important role in theorizing educational experiences and inciting socially just teaching practices. Currere is a reflexive process that consists of four steps or moments (regressive, progressive, analytical, and synthetic), which enable one to better understand and “act upon the past to influence the future” (Kanu & Glor, 2006, p. 105). In this critical autobiography, I will engage with currere’s four moments to provide depth and understanding to my role as a science teacher educator and a graduate student researcher. In doing so, I argue that currere holds significant promise for transformative change in the curricular and pedagogical practices of teacher education.

Regressive Moment

Early in my career as a fourth grade teacher in an urban elementary school, Tyrell walked into my classroom. He held his science book tight against his chest, and a yellow pencil was tucked behind his ear. He greeted me with his usual:

“Sup, Mr. E.?”

“Science is what’s up, Tyrell. It’s time for science,” I replied.

“C’mon, Mr. E., don’t you know only White kids like science?”

Our conversation ended as quickly as it began, and four days later, Tyrell and his family moved out of state. What he said left me speechless and uncomfortable. At the time, I did not understand Tyrell’s viewpoint, and I wished I had made science come alive for him, and that I could have changed his negative perspective. Yet what he said about science set in motion within me a series of often difficult self-reflections that caused me to examine my beliefs and practices as a teacher. In currere’s regressive moment, Pinar (1975) urges us to “return to the past to capture it as it was, and as it hovers over the present” (p. 6). Through currere, the incident prompted me to consider my past experiences with and personal conceptions of science.

My own science education began in the foothills of the Ozark Mountains in southwest Missouri in the United States. My earliest memories took place planting in our garden, walking ankle-deep in streams, discovering the forests, or helping my father work on an old tractor. I knew the seasons, the names of trees and wildflowers, and the mating seasons of the wild game that dressed our dinner table. I always looked forward to science class in school, and I enjoyed the hands-on activities we conducted. An avid reader, I also often thumbed through countless books from our local library about astronomy, physics, and biology.

As a young boy, I used to daydream about conducting experiments, and I wanted to become a professional scientist. I saw myself working alongside Albert Einstein, Gregory Mendel, or Galileo Galilei. The scientists I looked up to, the guest speakers who came to my school, and the star of my favorite television show, *Mr. Wizard*, always looked like me – White and male.

Throughout my middle and high school and undergraduate years, I was taught that scientific knowledge was superior to other ways of knowing because it was objective and evidence-based, with facts and truth about the world derived from proven scientific methods. Textbooks, official school curriculum, and teacher lectures depicted scientists as dispassionate, emotive-free beings, with no social or political agendas other than increasing the standard of living for humankind. Lastly, I learned that science was a value-free and acultural endeavor, and therefore, the most reliable method to pursue and understand the truth (also see Hodson, 2008, for a detailed critique of the mainstream understanding of science).

My love for science and the desire to share it with others led me to become an elementary school teacher. I began my career with 28 fourth graders in a rural town in southwest Missouri in 1998. Although I enjoyed teaching all subjects, I made a specific point to integrate science as much as possible into various content areas. My focus was on inquiry-based activities that engaged students in doing science and not just learning science concepts. I connected well with my students and was able to forge strong relationships with them and their families.

Seeking new challenges, I left my rural community in Missouri for the largest city in Ohio, and was hired to teach fourth grade science in an elementary school that served poor and racialized minority students. It was in 1999, during my first year in Capital City Schools (CCS) (pseudonym), when I met Tyrell and others like him, students who did not share my enthusiasm for science. I spent the next 10 years as a teacher and administrator in CCS working beside students and families who would challenge my beliefs, my privileges, and my taken-for-granted assumptions. Consequently, I began to reconsider science, and strived to teach it in a more inclusive and equitable manner.

Progressive Moment

Through my experiences as an elementary school educator, I have come to believe that schools act as sites of social reproduction that maintain the status quo, rather than as emancipatory and transformative spaces for marginalized youth (Apple, 2004). Teachers’ failure to bring a critical lens to their work further perpetuates systems of privilege and oppression. In the progressive moment, Pinar (1975) urges us to look at “what is not yet the case, what is not yet present” (p. 9) and to consider our anticipations for the future. My vision for elementary science teacher education is one that empowers future teachers to become critical pedagogues and agents of change (Freire, 1970).

For my Ph.D. thesis, I proposed a study entitled “Teaching Science for Social Justice: An Examination of Elementary Preservice Teachers’ Beliefs.” This study focused on an elementary science methods course that I taught at OISE University of Toronto, and drew on what I call a *critical – cultural* framework of curriculum theorizing as it pertains to science education. Drawing from the fields of critical pedagogy, critical multiculturalism, and anti-colonial theory, critical-cultural scholars foreground issues of power, oppression, culture, and identity to address the

goal of dismantling structural inequities, such as academic achievement gaps (Apple, 2004; Kanu, 2006). Apple (2004) asserts that curriculum is inherently political and that schools are oppressive to non-dominant communities because they reproduce the values, norms, and knowledges of dominant groups, namely those who are White, middle class, heterosexual, and male. Refuting the myth that education acts as the “great equalizer,” Apple contends that curriculum is a cultural product that reflects, reinforces, and benefits those in power.

To disrupt the reproduction of dominant ideologies, Kanu (2006) proposes the notion of “curriculum as cultural practice” (p. 4). She argues that culture, or the “beliefs, values, and meanings on which different groups draw to make sense of their world,” must be at the nexus of curriculum theorizing (p. 4). Like Apple, Kanu posits that curriculum embodies the values and ideologies of the dominant Western culture. Curriculum is much more than content standards or instructional strategies; it also includes practices and ways of doing that are enacted on a daily basis. Hegemonic curriculum practice foregrounds a Eurocentric curriculum that is underpinned by a white supremacist view of Aboriginal and racialized minorities as primitive and inferior, and a civilizing mission to assimilate them into what are deemed as idealized norms (Aikenhead & Michell, 2011). Combined, Apple’s and Kanu’s insights challenge curriculum norms and can bring about new curriculum practices that are more culturally relevant and engaging to the lived experiences of Aboriginal and racialized minority students. By making these changes, teachers can positively impact student learning and academic achievement.

Grounded in the critical-cultural framework, my research asked pre-service teachers to engage with questions such as: Who does science? What kind of science gets done? Who funds it, and for what purpose? Who benefits from scientific advances, and who loses? Whose perspectives and worldviews are present in science and curriculum, and whose are marginalized? I wanted preservice teachers to interrogate science as a social enterprise and to understand that “science is not something in the sky, not a set of eternal truths waiting for discovery. Science is practice. There is no other science than the science that gets done....The agendas in scientific and technological research reflect the prevailing values of a given culture” (Young, 1987, p. 18). Questions such as these challenge dominant views of science and numerous scholars have argued that such an approach to science education is necessary to increase the interest and achievement of Aboriginal and racialized minority students (Brickhouse, 1994; Harding 1991; Hodson & Dennick, 1994; Richmond et al., 1998; Snively & Corsiglia, 2001).

Central to my teaching was engaging pre-service teachers to problematize the hegemonic conceptualization of science as positivistic, purely objective, and free of human values, culture, and emotion. By doing so, I wanted to expose them to a nuanced version of science that highlights its racialized and gendered roots and legacies and to the myth that science occurs in an uncontaminated vacuum. Rather, my teaching situated mainstream science as representing dominant ideologies of society, and those of White men who often use it to benefit them at the expense of others. Jane Gilbert (2001) refers to the “neutral, objective, disembodied, raceless, classless, sexless, subject of science [as] an illusion” (p. 295). Finally, I gave readings on alternative worldviews and scientific ways of knowing, such as those from Aboriginal cultures as a way to challenge the epistemological foundations of the field. I align myself with science education scholars who argue that teachers must build cultural bridges and present science as a combination of both Aboriginal and Western knowledge systems (Aikenhead & Michell, 2011; Hatcher et al., 2009).

Ultimately, teaching science for social justice entails challenging the hegemony of Western science and linking its meaning and relevance to students. In my experience, re-conceptualizing science in this way creates opportunities for diverse students’ personal and educational success.

Analytical Moment

In the analytical moment, Pinar (1975) asserts that we should “describe the biographic present” (p. 11). When I originally wrote this article, I was at the early stage of my shift from an elementary school practitioner to a university-level science teacher educator and a Ph.D. student at OISE, University of Toronto. Since I began my academic employment at OISE in 2009, I consistently taught a science methods course to different Primary/Junior and Junior/Intermediate division students in the teacher education program. The course met for six sessions for a total of eighteen hours over the span of nine months. Each year, I approximately had 250 students who were overwhelmingly White, female, English-speaking, and from middle class backgrounds. These demographics contrasted with the students they would work with in practicum placements in the Greater Toronto Area schools where the majority of students are of a racialized minority and linguistically and economically diverse backgrounds (Brown & Sinay, 2008; McKell, 2010).

Although I incorporated topics of social justice in my initial year of teaching at the university, during my second year, I began to realize that my efforts were merely add-ons and not central to the course. For example, having pre-

service teachers identify and discuss the contributions of marginalized individuals and groups that were frequently left out of science books did little to help them understand the concepts of cultural competence and critical consciousness without larger discussions of power, privilege, and identity that dramatically impact the school and social realities of racialized minority, linguistically diverse, and economically marginalized students and their families (Ladson-Billings, 1995).

During my second year at OISE, I also began my Ph.D. program in Curriculum Studies and Teacher Development, and immersed myself in science education research. My examination of the scholarly literature in science education, especially in urban contexts in the United States and Canada, revealed disturbing patterns. Research in science education reveals that: (1) there is a racial achievement gap in science between Black, Latino, and Portuguese students and their White peers in the Toronto District School Board (Brown & Sinay, 2008; McKell, 2010); (2) urban students and students of color possess negative attitudes towards science and their future careers in science (Zacharia & Calabrese-Barton, 2004); (3) there is a gender gap between girls and boys in regard to their interest in science (Jones et al., 2000); (4) women are not pursuing science-related careers (Lee & Buxton, 2010); (5) there is an overall decline in positive attitude towards science as females and students of color move through school (Alsop, 2005; Patrick et al., 2009); and (6) there is a science achievement gap between urban and non-urban students (NAEP, 2006).

These findings were crucial in the analytical moment as I was examining my university pedagogy as a teacher educator and the scholarly literature as a doctoral student. They incited intense personal reflection on my own beliefs and practices regarding science and science education. They made me pause and ask: What can I do differently?

Synthetical Moment

In curree's synthetical moment, we are encouraged to draw from the previous three moments and "utilize insights from the past, present and future to create transformed educational environments" (Kissel-Ito, 2008, p. 341). In the earlier section for the progressive moment, I outline a critical-cultural curriculum, which serves as the central curricular framework for my "Teaching Science for Social Justice" course. In this section, I provide a theoretical foundation for the course, and I describe the three main assignments that depict a transformation in my teaching.

My knowledge, practices, and experiences as an elementary science teacher, science curriculum author, school principal, university lecturer, and doctoral student have led me to theorize that teaching science for social justice is composed of three separate, but highly interrelated dimensions: critical nature of science; critical knowledge and pedagogy; and teaching for socio-political action. These dimensions serve as a theoretical foundation for the science methods course:

1. *Critical Nature of Science (NOS)*: Counters the dominant view of Western science as objective which depicts the one 'truth' about the natural world. This dimension positions science as a socio-political and cultural practice that is subjective, value-laden, and dependent upon community and geography (Aikenhead & Michell, 2011; Brickhouse, 1994).
2. *Critical Knowledge and Pedagogy*: Demands that science instruction be linked to students' cultures and worldviews. Working against the deficit approach, teachers access students' funds of knowledge and engage in culturally relevant pedagogy (Ladson-Billings, 1995; Parsons, 2008).
3. *Socio-political Action*: Is based on the premise that mainstream science curriculum and instruction reinforces unequal power relations deeply rooted in society. To counter this, scholars advocate for science experiences that develop student agency for progressive change (Calabrese-Barton, 2003; Hodson, 2008).

I have developed three major assignments for the course, and each assignment corresponds to the dimension of the same number:

1. *Visual Collage of Aboriginal and/versus Western Science*: Drawing from *Building Bridges: Indigenous and Scientific Ways of Knowing Nature* (Aikenhead & Michell, 2011): Preservice teachers compare and contrast Indigenous and Western worldviews using a visual collage. They reflect on how the two different views of science shape our notions of truth, evidence, validity, and use.
2. *Culturally Relevant Lesson Plan*: Pre-service teachers develop a culturally relevant science lesson plan that is aligned with the provincial science curriculum. They are encouraged to consider the student demographics and community contexts of their practicum schools (Ladson-Billings, 1995).
3. *Environmental Justice Strategy*: Pre-service teachers read articles and view videos concerning environmental racism and environmental justice at local, national, and international levels. They then

identify an environmental issue that needs to be addressed, and generate a strategy of action that involves pertinent stakeholders. The strategy highlights the environmental issue, its local impact, and how they engage students in socio-political action concerning the issue (Hodson, 2008).

The assignments represent each of the three dimensions of teaching science for social justice. I posit that engaging preservice teachers in critical dialogue, readings, and activities will better prepare them to meet the academic needs of their future students—many of whom already have strained relationships with science.

Conclusion

In this article, I have engaged Pinar's concept of *carrere* as an "amateur intellectual" (Kanu & Glor, 2008). I began the regressive moment with a conversation with a former student, an encounter which caused within me much anxiety and disequilibrium. This conversation also prompted further reflection as I examined my relationship with science from my youth as well as my ten professional years as an elementary school educator. In the progressive moment, at the time of the original writing of this article I imagined the future from the stance of a university-level science teacher educator and researcher. I outlined the possibilities for a research study on teaching science for social justice involving preservice teachers in my science methods course. The analytical moment allowed me to describe how I was teaching the science methods course. Lastly, in the syncretical moment, I provided an analysis of the three other moments by detailing my transformed pedagogical practices. My hope is that such practices will prepare preservice teachers to teach science in a critical manner that meets the needs of the diverse student populations they will serve.

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