Chapter 10
Incorporating Social Justice Into Science Teacher Education Courses

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ABSTRACT
In this chapter, the authors cover the importance and challenges of incorporating teaching for social justice in science teacher education courses. The chapter starts by providing an overview of the literature on social justice, specifically in science education, and define the terms social justice, equity, and diversity. Then, the authors, who are teacher educators from under-represented groups, share their own experiences about what led them to do social justice work. In addition, the authors present examples from their courses with their preservice teachers and instructional strategies they used. The chapter concludes with recommendations of ways in which we might consider implementing social justice practices in teacher preparation courses.

INTRODUCTION
The implications of this paper are dire, in the respect that White society is to blame, and they are the ones who are racist. The paper continues to talk about institutionalized racism (not a thing) and White privilege (also not a thing) to further drive the point home that White people owe others something and that they should stay in placements where they are unhappy. Long story short, this paper is written with incredible bias and has little to do with the objective nature of science.

We open our chapter with a response from a student discussion in a graduate level preservice science teacher class. Preservice teachers (PSTs) in this course were asked to read articles about culturally re-

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Responsive teaching in the science classroom and answer discussion prompts. Author 1 provided articles about the social Nature of Science (NOS) that includes equity and diversity in science. When race was discussed in the readings, students seemed to fall into two categories: 1) uncomfortable and avoid any deeper discussion or 2) deny and invalidate the discussion. After many similar experiences with students, Author 1 reached out to Author 2 for support. Back in 2011, both authors met at a weeklong science education graduate student fellowship program. Throughout the years, we, both authors, kept in touch as friends and also as a source of support as women of color becoming new faculty members at separate Universities. Author 1 was working at a Predominantly White University (PWI) and both authors taught classes that were a majority of White students. We chose this powerful quote because it pushed both authors to question why some PSTs resist acknowledging the systemic inequities that exist in schools and institutions and the need to do work around social justice. We asked ourselves, “Why are we hearing what we are hearing? How do we as teacher educators address the gaps, the silences, and the ‘unsayables’? How does writing about what is deemed difficult reveal what is invisible? And how can we, through this book chapter and our autoethnographic work, render the ‘unsayables’ sayable and the ‘difficult conversations’ heard? We needed to reexamine our teacher education programs to better understand what was happening.

Most teacher education programs are predominantly White in terms of faculty and PSTs (Ball and Tyson, 2013; Sleeter, 2013). In our case, we are not White and most of our students are White, so discussing race with our students tends to be more complex. However challenging these discussions may be, they need to take place in order for PSTs to be adequately prepared to teach in U.S. schools where the changing demographic is not predominantly White. Avoiding these discussions with our students leads to educational inequities. By not having these discussions we inadvertently reinforce the message to our White students that Whiteness is the norm and that they do not need to be race and culture conscious. This continues to recreate Whiteness as socially dominant. For instance, Author 1 uses the book, The Clockwork Universe by Edward Dolnick in her history and philosophy of science course. The book does a good job of describing the history and foundation of science but it is limited to who is always represented in science, older White males. This contributes to the idea that the foundation of knowledge is based on Whiteness while knowledge from other cultures is less valued (Cabrera, 2012). As a pre-tenured faculty member of color, Author 1 did not want to have confrontations in her class with students. This paired with students always having enjoyed the book, Author 1 decided to keep the book in the course. However, by not challenging these norms and not engaging in the discourse, the deficit perspective is not challenged.

We as educators are being called upon in higher education to look at pedagogies that support teaching and learning for social justice (Mills & Ballantyne, 2016). In the past decade, some of the driving concerns behind teaching for social was concerned with 1) how the historical/institutional and local relations of power shape opportunities for student participation in the science field, 2) challenges the socio-political context of science teaching and learning that exists in the current system, where the view of science literacy is important only for national independence and global competitiveness, and 3) how diversity is important not only for a more equal workforce but also because diversity can transform communities, practices, and values of the workforce. Some of the outcomes for teaching for social justice in science have been defined as possibly furthering important skills for students to participate in a democratic society in just ways, use science as context and a tool for change, and to critically evaluate the socio-political positioning of science in society (Adams, Bell, & Griffin, 2007). Barton and Upadhyay (2010) describe...