

# Willing to Turn to The Body

## Embodied Pedagogies in Social Justice Teacher Education

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Formal education contexts in general, but higher education in particular, including teacher education, tend to privilege cognitive, intellectual ways of knowing. As Lawrence (2012) notes, "...learning is perceived as something we do in our head" (p. 71). However, the literature on the importance of emotions and the body in learning is growing. Scholars such as Forgasz et al., (2014), Macintyre Latta and Buck (2008), and Nias (1996) have called for embodied knowledge to play a more primary role, specifically in teacher education. Estola and Elbaz-Luwisch (2003) "argue the need for a revaluing of embodied knowledge in teacher education, citing the particular role that embodied knowledge can play in the reflective process" (cited in Forgasz & McDonough, 2017, p. 54).

In the context of social justice education courses in which preservice teachers are learning about and confronted with the realities of various forms of oppression (e.g., Mills & Ballantyne, 2016), an approach to pedagogy that normalizes strong emotions and their embodiment is especially important and appropriate. Boler offers a helpful conceptual framework with her "pedagogy of discomfort" (1999), suggesting that deep learning can occur if and when teachers and students are willing to sit with the uncomfortable emotions and body sensations that arise when encountering potentially difficult topics, such as racism, white privilege, and classism, rather than turning away in fear and/or getting hijacked by intellectualizing. These ideas are corroborated by Matias and Mackey (2016), who argue,

Teachers who experience an emotional-based curriculum and pedagogy focused on deconstructing their own emotionality move beyond discomfort, guilt, sadness, defensiveness, anger. Without doing so, they can easily revert to whiteness and thus reinforce the racist educational system. In the end, a teacher must develop emotional fortitude in antiracist teaching, for how can one commit to racial justice if she or he cannot withstand the emotional burden of being antiracist her or himself? (p. 48)

Embodied pedagogy in social justice courses is a promising approach to helping preservice teachers develop this "emotional fortitude" for anti-oppression teaching. However, students and professors alike need to be "willing to be disturbed," as Wheatley discusses in her 2002 essay. We often learn more when we confront the uncomfortable.

Furthermore, Blackwell's (2019) words help elucidate the importance of embodied learning in social justice contexts:

It's easy to bypass what our bodies know. We've been conditioned to stuff down

uncomfortable feelings or simply toss them away so that we might “get along” in a society that does not regard our capacity to *feel* as wisdom. This disconnection from the body allows us ostensibly to work towards racial justice while at the same time ignoring these *isms* as they show up in our relationships, lives, and world. (p. 15)

Berila’s (2016) mindful anti-oppression pedagogy framework stresses the necessity of an embodied approach to social justice education, one that extends studying oppression at a conceptual level. Berila refers to somatic expert Levine’s (2010) description of embodiment as a required component for “effectively transform[ing] both ourselves and the larger collective” (2016, p. 33):

Embodiment is about gaining, through the vehicle of awareness, the capacity to feel the ambient physical sensations of unfettered energy and aliveness as they pulse through our bodies. It is here that mind and body, thought and feeling, psyche and spirit, are held together, welded in an undifferentiated unity of experience. (p. 279, emphasis in Levine original)

Embodiment offers a path for preservice teachers to pay attention to and integrate one’s reactions at the levels of body, heart, and mind so they can respond from a place of groundedness and nonreactivity to unanticipated, unfamiliar, and often uncomfortable situations and course content.

This chapter responds to Forgasz and McDonough’s (2017) call for teacher educators to “experiment with embodied pedagogies, to research their experimentation and to share their learning about embodied approaches through self-study” (p. 65). We—two white, female, experienced social justice teacher educators—have been attempting to broaden the experience of social justice teaching and learning beyond the cognitive. We deliberately infuse our courses with emotionally provocative content and intend to create a more fully embodied social justice pedagogy to help preservice teachers learn to respond to emotions in a more helpful way, and therefore be able to serve their own diverse students from a more balanced, authentic perspective.

This approach is challenging for us, because as female academics, we have been trained to cultivate and rely upon our minds, and we work in higher education institutions that privilege intellectual ways of knowing. However, our extensive training and experiences in contemplative practices and pedagogy (Barbezat & Bush, 2014) have helped us learn to balance our intellectual efforts with a more emotional, embodied approach to our practice in general, but particularly in our diversity courses. These contemplative practices include but are not limited to meditation, silence, close reading, mindful movement, journaling, and mindful dialogue.

## **Aims/Objectives**

### ***Research Question***

- How do we attempt to use embodied pedagogies, blending the emotional with the cognitive, in social justice education courses for prospective teachers?

## Methods

This chapter reflects self-study elements codified by LaBoskey (2004): self-initiated, improvement aimed, interactive, multiple qualitative methods, and trustworthiness through the collaborative process of reflective conversation and analysis over time. Data were collected from multiple years of diversity courses in our U.S. teacher education programs and included teacher artifacts such as assignments, lesson plans, and reflective journals; student work and responses to specific embodied pedagogical practices; and a year of critical friends discussions.

This study represents a critical collaborative inquiry in which we “provoke new ideas and interpretations, question the researcher’s assumptions, and participate in open, honest, and constructive feedback” with one another (Samaras, 2011, p. 75). Because of our long-term relationship, and our respective use of contemplative practices, we were able to stay embodied as we provided each other with constructive feedback and asked challenging questions about the data sources we were analyzing. We applied this framework to collaborative qualitative analysis in these steps:

1. Identified and discussed pedagogical elements that appeared to reflect embodied learning and began to organize them into themes.
2. Read, referred back to the literature on embodied pedagogy in a cycle of developing understanding as we compared the identified examples from our practice to the literature’s discussion.
3. Read, reread through the identified pedagogical examples to clarify more fine-grained themes and codes (Spindler & Spindler, 1997; Spradley, 1980), looking for strengths and areas for growth in our approaches.
4. Selected representative examples of our attempts to implement embodied pedagogies.

## Findings

The analysis revealed three main categories of embodied pedagogies for social justice education which are illustrated below with examples: 1) experiential learning; 2) concrete examples of moving beyond cognitive reflection to more embodied learning; 3) normalizing and encouraging emotional expression and turning to the body as a source of understanding, knowing, and deep self-awareness.

### ***Experiential Learning***

It is difficult to practice embodied learning while engaged with readings and theory alone. Experiential, active learning is one form of embodied pedagogy that allows prospective educators to use their bodies as a site for developing understanding. Both authors implement this approach in their diversity courses, but as one example, we focus on Grassi’s approach here.

Preservice teachers need experiences that touch them deeply in order to engage in the practice of “sitting with the difficult,” and “embodying emotions.” Regular field placements in schools are helpful, but preservice teachers do not “own” the experience; they enter a mentor’s classroom and only have as much interaction with students as the mentor permits. Students need an experience that will mimic the chaos, frustration, joy, and deep emotions that teachers experience in their own classrooms.

Grassi, in collaboration with others, developed an experiential program called “Spanish-English Exchange Program” (SEEP) for preservice teachers (Grassi & Castro, 2011; Grassi & Armon, 2015). For one semester, preservice teachers visit immigrant families in the neighborhood once a week. The families determine the length and activities of each visit.

But Grassi’s preservice teachers, who come with a perspective of providing “service,” are discombobulated by this program. The host families (who are traditionally viewed as “people in need” by white affluent students) are placed in positions of power: the families are offered stipends to teach the students about their culture, their languages, and the challenges they face as immigrants to the U.S. The preservice teachers enter the families to not only help in any way needed, but to learn, to experience a culture and a language other than their own, to develop a relationship with the “other” where the student is not in power, and to discover the barriers immigrants face to academic success. While this places a burden on the families to “educate” our students, we still find that this is a powerful learning experience for preservice teachers. Thus, this creates a dilemma that we who developed SEEP need to examine.

### ***Concrete Examples of Moving Beyond Cognitive Reflection to More Embodied Learning***

As we analyzed pedagogical examples and student work from our diversity classes, it became clear how conditioned we are as academics to focus on cognitive ways of knowing and to cultivate that in our students. In an effort to infuse more embodiment into our pedagogical approaches, drawing from our backgrounds with contemplative practices, we both have been explicitly revising various prompts, questions, and learning activities to cultivate students’ embodied self-awareness and expression of emotion.

Dorman realized through collaborative analysis, for example, that many of the prompts she designed for various assignments in social justice education courses asked students to describe their thinking, mental understanding, or occasionally to name their feelings, but without an embodied component. Now, for much of the emotionally provocative content she introduces, such as civil rights lawyer Bryan Stevenson’s powerful “Confronting Injustice” SXSW video talk (2015), she deliberately asks students to pay attention simultaneously to the audio/visual input and to their own responses to the content. Importantly, before engaging with content, the students and professor take a few moments to center themselves with a short mindfulness exercise such as a body scan, breathing meditation, or lovingkindness so that their hearts are open and their bodies are prepared to feel. While watching the media, using a graphic organizer, students track and are asked to describe specifically, “What responses or reactions do you notice in your body? What emotions or feelings do you notice? What thoughts do you notice?” This is followed by a collaborative sharing activity which tends to generate a lot of tears as students share what came up for them. Motivated by Stevenson’s powerful ideas, each person takes turns going around the room, committing orally to taking a specific action against injustice as they are witnessed by their classmates and professor.

For Grassi, in the context of the SEEP program, reflective discussions and papers provided an opportunity to move from a traditional stance toward reflection to an embodied approach to learning. Grassi relied for years on traditional reflection techniques: papers, in-depth class, and small group discussions around critical questions. Classroom discussions focused around the experience with the families, what students learned, and how this learning informed their future teaching. The class discussed on the intellectual level, without ever taking a pause to discuss what students felt by participating in this program.

Yet, Grassi had developed the program specifically to evoke strong emotions. She noticed that some students attempted to bring emotions to the class and written reflections. Students would express distress such as, “Why would people let this happen to the family?” “How can people not see what these families go through?” (Grassi & Bair, 2018). Students would also express emotions around their own fears and anxiety: “I was so nervous I bit off all my fingernails.” “I didn’t know what to do, do I help the mom, do I stay seated? So I sat there stupidly.” And the class would nod in agreement. Grassi assumed this was reflection enough, and she encouraged the class to move toward action: How can we improve the situation? What strategies can we incorporate in our classrooms to assist families?

As Grassi expresses, “I did not bring feelings into the discussion; I did not allow for expression of distress when family members lost jobs or were sick; I did not allow feelings of frustration when students tried to negotiate in a language and culture other than their own. My classes left no space for students to *feel* the deep emotions associated with developing a relationship with their host family. I celebrated any connections students could make to theory and limited any expression of feeling. She writes, “I was preparing high-quality teachers who were well-versed in inclusive strategies and justice education, who were willing and able to compassionately engage with students, but were unable to stop, feel, and engage with themselves” (Grassi & Bair, 2018, p. 85). The class had to move beyond thinking about emotions to feeling emotions within their bodies, understanding them, and befriending them.

To encourage embodied reflection, moving beyond the cognitive, Grassi and Dorman use specific contemplative pedagogies: body scan meditations; feeling pauses, and lectio divina.

**Body Scan Meditation.** It is one thing to request students “feel their bodies and the emotions within;” it is quite another for students to be able to engage in this practice. To help students progress to a feeling state, Grassi and Dorman start some classes with a body scan. We notice the various parts of our body, without the need to judge or change anything. As we progress in our noticing, we also bring awareness to thoughts and/or emotions connected to certain parts of our bodies. We label them (sadness, fear, anxiety, happiness), and let them be, sitting with them regardless of how pleasant or unpleasant they are. We do not try to fix anything; we just notice at the start of every day. This exercise gets the students in their bodies, grounded, and ready to interact with the course content and feel any emotions associated.

**Feeling Pauses.** During class discussions and reflections, we pause, to notice where and what we feel in our body as we describe and reflect on course content. We leave discussion space for the validation of feelings underneath the experience. When discussing the experience, if students are too heady, we have learned to pause, articulate what is happening in our body and with our emotions in response to the student’s description, and ask the class to engage in the same. As we practice, students become more and more accustomed to not only describing the situation but articulating the emotions behind their experience of the situation. When talking about the SEEP program, what

previously looked like, “The father lost his job and now the family has no steady income,” has become, “I feel so sad and so hopeless. The father lost his job and now the family has no steady income. I feel distressed that I cannot help. I feel sad for this family.” We do not ask students to change their emotions. We do not try to “fix” the situation; we simply feel the emotions behind the situation and sit with the discomfort. In this manner, students learn to feel first before they respond, rather than react quickly to emotions they cannot even recognize. Each time we feel, and sit with the feeling, we better understand how to respond in a caring, compassionate manner.

***Lectio Divina.*** We both implement *lectio divina*, which translates as “sacred, divine reading” (Oliver et al., 2018). *Lectio divina* traditionally involves four steps: *lectio* (reading), *meditatio* (reflection), *oratio* (response), *contemplatio* (rest). We take liberty with these steps, going beyond written texts and responses, inviting students to make meaning of the text by turning inwards and listening deeply to their bodies and hearts.

In the *meditatio* step, we emphasize *feeling* the words, opening oneself to hearing what the words are saying. In the *oratio* step, students are invited to express in multimodal ways how they are responding emotionally to the text. Students may express themselves in writing, but many choose instead to draw or physically move in some way. Students are encouraged to reflect not only on what aspect of course readings spoke to them but also to relate texts to previous course content. The *contemplatio* step is a receptive process described by Dalton (2018) as returning “to stillness, integrating the experience more deeply and allowing both the words and the images to touch the deepest parts” of ourselves, creating transformation from within (p. 20).

Lectio divina allows students to not only respond emotionally and through their bodies to the assigned text, but also they readily bring that emotion to broader field study contexts. What used to be a theoretical discussion has now developed into a more balanced understanding that draws from theory but also acknowledges the embodied feelings evoked by the theory, applied to real-life situations.

### ***Normalizing and Encouraging Emotional Expression and Turning to the Body as a Source of Understanding, Knowing, and Deep Self-Awareness***

Through experiential practice and analysis, it has become clear to us that in order to implement embodied pedagogies in social justice education courses with any effectiveness at all, we need to normalize and encourage emotional expression, and the practice of turning to the body as an epistemological site (Gustafson, 1999). In doing so, we are counteracting the traditional, cognitive views of teaching and learning embraced by academia, into which we are and our students have been socialized. This requires us to be willing to be vulnerable and willing to feel and express emotions in front of our students, even when this is uncomfortable.

Dorman has been incorporating *The Five Dimensions of Engaged Teaching* (Weaver & Wilding, 2013) as a contemplative framework for developing these skills and dispositions. The dimensions are: be present, engage the self-observer, cultivate an open heart, develop emotional capacity, and establish respectful boundaries. These dimensions have become touchstones for students and me as the professor to develop self-awareness and social, emotional, cultural competence (Stevenson & Markowitz, 2019) as we engage in conversations around race, racism, white privilege, and other social justice topics. These dimensions have become part of the daily language in our classroom.

These dimensions have also been a powerful framework for modeling to students being vulnerable

and human and turning to the body for wisdom and solace. For example, one day before class, a student told me (Dorman) some distressing news about a personal tragedy. It triggered deep compassion and pain in me because I shared a similar past experience. Just as class was supposed to begin, I could feel my stomach, chest, and throat tighten with sadness and impending tears. I opened my mouth to speak, but no words emerged. I quickly assigned students a partner activity, and I fled to an adjacent, private room, where I burst into tears and sobbed for a few minutes, my body shaking, then did deep belly breathing to soothe my nervous system.

When I had calmed myself down enough to be able to function and teach, I went back into the classroom. I took a deep breath, feeling the familiar tingling in my torso that signified feeling vulnerable, and shared, “See? *The Five Dimensions* are a real thing. They are not just a theoretical framework.” Without going into details of the personal situation, I briefly explained how I had engaged the self-observer and present moment awareness to recognize that I was triggered, and needed some time to let the emotions course through my body in sobs before being able to resume teaching. We talked about how they, too, could use the five dimensions to turn towards embodied feelings when encountering difficult emotions, in the course of their lives.

In Grassi’s SEEP program, as a result of the contemplative activities described previously, the students (and the professor) are often brought to deep emotional states when discussing the family experience and the readings. But by practicing contemplative activities during the class, these emotions become a normal part of the discussion. I (Grassi) have found that as the professor, I am no longer embarrassed if I am overcome by emotion in front of the class. My classroom holds all emotions, and we practice just noticing and sitting with the discomfort.

Recently, a preservice teacher in one of our classes shared their own painful story of immigration and pointed to their body as they spoke, “I felt it here [pointing to their stomach], not here [pointing to their heart], if you know what I mean.” Students, who had practiced feeling in their bodies, nodded in agreement and understanding. We have also found that our preservice teachers have learned to sit, listen to their bodies, and listen to and feel the people they work with first, before jumping to an action—an action that is most often decided by students who are positioned as the privileged, knowledgeable college student. Our students consider their own feelings and the feelings of others as valid experiences to be taken into account in any decisions. This translates well to the classroom; teachers who take into consideration the perspectives and feelings of their students make classroom management and curricular decisions that are caring, compassionate, and meaningful.

Some of the most powerful “action” our preservice teachers take in the teaching field is “non-action.” For example, when a preservice teacher encountered a newcomer student in their field placement and recognized the distress the student felt with the new culture, new classroom rules, and the inability to communicate, the preservice teacher just sat with the student without attempting to fix anything. Unable to communicate with the student in words, the preservice teacher communicated through their presence and by listening deeply to the student (whether they understood or not). We find that preservice teachers apply the contemplative practices offered in the college class in their clinical placement classrooms, just being with P-12 students and giving the gift of presence, regardless of the situation and emotions.

## **Final Reflections**

These findings illustrate some of our attempts to enact embodied pedagogies in which learners “use

their body as an instrument for developing understanding, knowledge, and wisdom” (Gustafson, 1999, p. 268). We have made strides in our approach but still need to grow so that preservice teachers are equipped with the “emotional fortitude” and embodied skills for antiracist teaching as they step into their own diverse classrooms.

The primary challenge we have encountered in attempting to implement embodied pedagogies is that we are conditioned to default to the cognitive and intellectual rather than the emotional and embodied, due to our training and conditioning as white, female academics. Our cognitive, intellectual training as academics continuously battles with our training in contemplative, embodied pedagogy.

Our default mode (and that of our students) tends to be cognitive representation, even when trying to articulate orally or in writing what an experience of embodied awareness was like. Sometimes, language is just not sufficient and accurate enough to represent or describe embodiment. The pedagogies we incorporate in our classes are small steps to transform this mental habit. But we remain torn as to how we can conduct our classes with more of a balance between emotional embodiment and cognitive pursuits. Touching on emotions in academia is difficult and not encouraged. As Grace (2011) states, “Third-person theoretical ‘outsider’ knowledge is often more trusted in the academy than first-person experiential ‘insider’ knowledge” (p. 47).

Relatedly, this deliberate approach of embodiment and naming it as such explicitly in our pedagogy is still rather new for us. Even though we have both been teaching for decades, and have become comfortable integrating contemplative practices in the classroom, the embodied approach is newer for us both and involves experimentation and exploration in our pedagogy.

Responding to this challenge represents an ongoing exploration and inquiry for us. It will involve ongoing education for us as learners—but not just intellectual learning *about* embodiment. We need to continue to seek out direct, first-person experiences of embodied learning as active participants in the context of social justice education.

## References

Barbezat, D. P. & Bush, M. (2014). *Contemplative practices in higher education: Powerful methods to transform teaching and learning*. Jossey-Bass.

Berila, B. (2016). *Integrating mindfulness into anti-oppression pedagogy: Social justice in higher education*. Routledge.

Boler, M. (1999). *Feeling power: Emotions and education*. Routledge.

Blackwell, K. (2019). Race and the body: Why somatic practices are essential for racial justice. *The Arrow Journal*, 6(1), 10-24. <https://arrow-journal.org/the-necessity-of-including-embodiment-and-lineage-in-racial-justice-work/>

Dalton, J. E. (2018). Embracing a contemplative life: Art and teaching as a journey of transformation. In J. E. Dalton, E. H. Dorman, & K. Byrnes (Eds.), *The teaching self: Contemplative practices, pedagogy, and research in education* (pp. 13-25). Rowman & Littlefield.

Estola, E. & Elbaz-Luwisch, F. (2003). Teaching bodies at work. *Journal of Curriculum Studies*, 35,

697-719.

Forgasz, R., Berry, A., & McDonough, S. (2014). Embodied approaches to S-STEP research into teacher educator emotion. In D. Garbett & A. Ovens (Eds.), *Changing practices for changing times: Past, present and future possibilities for self-study research (Proceedings of the Tenth International Conference on Self-Study of Teacher Education Practices)* (pp. 82-84). University of Auckland Press.

Forgasz, R. & McDonough, S. (2017). "Struck by the way our bodies conveyed so much:" A collaborative self-study of our developing understanding of embodied pedagogies. *Studying Teacher Education*, 13(1), 52-67. <https://edtechbooks.org/-qnB>

Grace, F. (2011). From content to context to contemplation: One professor's journey. In J. Simmer-Brown & F. Grace (Eds.), *Meditation and the classroom: Contemplative pedagogy for religious studies* (pp. 47-64). SUNY Press.

Grassi, E. & Castro, O. (2011). Learning from our neighbors: Teachers studying "abroad" with local immigrant families. *Accelerate Quarterly Review of the National Clearinghouse for English Language Acquisition*, 4(1), 10-12.

Grassi, E. & Armon, J. (2015). Re-envisioning TESOL teacher education: The transformative power of teachers studying "abroad" in the neighborhood. In J. M. Wurr & A. J. Perrin (Eds.), *Learning the language of global citizenship, strengthening service-learning in TESOL* (pp. 420-459). Common Ground Publishers.

Grassi, E. & Bair, H. (2018). Community, compassion and embodying presence in contemplative teacher education. In K. Byrnes, J. Dalton, & E. H. Dorman (Eds.), *The teaching self: Contemplative practices, pedagogy, and research in education* (pp. 83-92). Rowman & Littlefield.

Gustafson, D. L. (1999). Embodied learning: The body as an epistemological site. In M. Mayberry & E. C. Rose (Eds.), *Meeting the challenge: Innovative feminist pedagogies in action* (pp. 249-273). Routledge.

LaBoskey, V. K. (2004). The methodology of self-study and its theoretical underpinnings. In J. Loughran, M. Hamilton, V. K. LaBoskey, & T. Russell (Eds.), *International handbook of self-study of teaching and teacher education practices* (Vol. 1, pp. 817-869). Kluwer.

Lawrence, R. L. (2012, Summer). Coming full circle: Reclaiming the body. *New Directions for Adult and Continuing Education*, 134, 71-78.

Levine, P. (2010). *In an unspoken voice: How the body releases trauma and restores goodness*. North Atlantic Books.

Mills, C. & Ballantyne, J. (2016). Social justice and teacher education: A systematic review of empirical work in the field. *Journal of Teacher Education*, 67(4), 263-276.

Macintyre Latta, M. & Buck, G. (2008). Enfleshing embodiment: "Falling into trust" with the body's role in teaching and learning. *Educational Philosophy and Theory*, 40(2), 315-329.

Matias, C. & Mackey, J. (2016). Breakin' down whiteness in antiracist teaching: Introducing critical whiteness pedagogy. *Urban Review*, 48, 32-50.

Nias, J. (1996). Thinking about feeling: The emotions in teaching. *Cambridge Journal of Education*, 26, 293-306.

Oliver, K., Dalton, J., Hall, M., & Hoyser, C. (2018, October). *Reimagining community & scholarship: Lectio divina as a tool for transformative education*. Presentation at the 10th Annual Conference of the Association for Contemplative Mind in Higher Education, Amherst, MA.

Samaras, A. (2011). *Self-study teacher research: Improving your practice through collaborative inquiry*. Sage.

Spindler, G., & Spindler, L. (1997). Cultural process and ethnography: An anthropological perspective. In G. Spindler (Ed.), *Education and cultural process: Anthropological approaches* (pp. 56-76). Waveland Press.

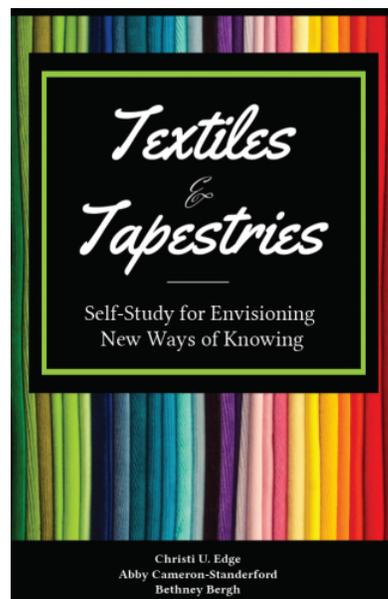
Spradley, J. (1980). *Participant observation*. Orlando, FL: Harcourt Brace College Publishers.

Stevenson, B. (2015). *Confronting injustice*. SXSW video talk. <https://edtechbooks.org/-fjq>

Stevenson, H. & Markowitz, N. (2019). (Eds.) Social emotional learning and culturally responsive and sustaining teaching practices. *Teacher Education Quarterly*, 46(4).

Weaver, L. & Wilding, M. (2013). *The five dimensions of engaged teaching: A practical guide for educators*. Solution Tree Press.

Wheatley, M. J. (2002). *Turning to one another*. Group West.



Dorman, E. & Grassi, E. (2020). Willing to Turn to The Body: Embodied Pedagogies in Social Justice Teacher Education. In C. Edge, A. Cameron-Standerford, & B. Bergh (Eds.), *Textiles and Tapestries*. EdTech Books. Retrieved from [https://edtechbooks.org/textiles\\_tapestries\\_self\\_study/chapter\\_19](https://edtechbooks.org/textiles_tapestries_self_study/chapter_19)



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