CHAPTER 14

Learning, Teaching, and Social Justice: Eleanor Duckworth's Perspective

Yeh Hsueh

In a talk in 2012, Eleanor Duckworth clearly stated the values she brought to her education theory and practice: "As a teacher, and as a member of the human community, I make certain assumptions. I assume that we want students to come to feel the power of their minds, and of their creative capacities. I assume we want students' understanding to be deep, confident and complex and their means of expression to be varied and nuanced. I assume we want students to develop a sense of community responsibility, democratic commitment, and social justice" (Duckworth, 2012). She formed these convictions over a long and distinguished career that continues to inspire educators.

Eleanor Duckworth first studied with Piaget in Paris in 1957, and the next year, joined his research team in Geneva. She entered the field of education as a psychologist/piloting teacher in 1962, and went on to become recognized for her accomplishment as a scholar and practitioner in teacher education at Harvard University. Not only did she translate for Piaget for 15 years during his many visits to the United States, but she also draws on Piaget and Inhelder's work as a major source of inspiration in the field of learning and teaching (Duckworth, 2006).

Y. Hsueh (✉)
Educational Psychology and Research, University of Memphis, Memphis, TN, USA

D.W. Kritt (ed.), *Constructivist Education in an Age of Accountability*,
https://doi.org/10.1007/978-3-319-66050-9_14

The title of the then well-known publication *Piaget Rediscovered* (Ripple & Rockcastle, 1964) originated from her personal struggle and rediscovery of making connections between her research experience with Piaget and her involvement in developing an elementary science curriculum (Hsueh, 2005a, 2009). About those struggling years, Duckworth (1996) recalls, "Not only did Piaget seem irrelevant, I was no longer sure he was right" (p. 2). However, after she rediscovered the relevance of Piaget's theory to education, specifically to teaching and learning, she emphasized that, apart from stages and apart from specific children's ideas, many aspects of Piaget's theory are important for education. For example, "the whole idea of assimilation, the educational ideas I developed ever since" (Duckworth, 2000).

Many people believe that Jean Piaget's work has contributed to contemporary advocacy and practice in various constructivist movements in education since the 1970s. It might be surprising that someone like Duckworth, who worked closely with Piaget, had to struggle to see its connection with education. During her early education career, she had expressed doubts about the usefulness of Piaget's work in education. What, then, are her rediscovered connections?

In this chapter, I will present a few of Duckworth's educational ideas about teaching and learning in the larger context of schooling and school reform. These ideas embody her three assumptions in the opening of this chapter and reflect the continuous development of her own research on teaching and learning, which she later called "critical exploration in the classroom" (Duckworth, 2005b; for a brief history, see Hsueh, 2005b); interestingly, she has not specifically called her approach to education "constructivist." However, as an outstanding teacher educator, Duckworth's education method, which prioritizes learners' engagement with the subject matter, runs against the widely observable top-down school reform priorities. Her educational ideas place high values on learners as creative individuals living in a classroom that reflects a changing society. The materials cited below are from both published sources in different media and interviews I conducted with her in 2000 and 2016.

Education as Socialization

Education is a process of socializing the citizens of a society, particularly the young. Formal schooling has been the major form of such socialization in industrialized and post-industrialized societies. Since the early 1900s, the European-based system of formal Western schooling, including

age-segregated classrooms, has continued to spread due in part to industrialization, urbanization, waves of immigration, population growth, and globalization (Rogoff, 2003). Bureaucratic efforts to maintain and improve school systems have also stepped up to implement various top-down policies. For the past three decades since the publication of the well-known report *A Nation at Risk*, an increasing number of state and federal policies have appeared to propel school reform movements (Gordon, 2003).

Each wave of school reform has formulated new rules, regulations, and school policies governing the school life of teachers and students. A recent example is the enhanced testing culture in school systems around the country, which developed as part of the massive standardized testing movements. "The number of standardized tests U.S. public school students take has exploded in the past decade" (Layton, 2015, para 1). One study of 66 school districts found that students had to take 112 such tests on average between pre-K and grade 12 (Council of the Great City Schools, 2015). However, what is largely missing in these policy-driven reform movements regarding children's schooling and teachers' professional work is an understanding of "how people learn things and what anyone can do to help," the central questions Duckworth has asked over her entire teacher education career.

In Duckworth's view, every specific act in teaching, such as selecting curriculum materials, listening to learners' explanations, and engaging different views with one another, has a complex dual goal of socializing the learner into becoming an innovative and complex thinker in the classroom on the one hand, and on the other, becoming an active and empathic participant in the changing society. In John Dewey's (1916) view, this kind of learning and teaching in education should be the one and same reconstruction process by which human individuals improve their living and by which human institutions improve societal living. If education can be a vehicle of social reform toward this dual goal, then the so-called school reform in a democratic society should value learners' contributions to their own learning and to one another's learning in school. However, a high-stakes testing environment works against this educational function to diminish children's and teachers' learning and teaching, and impedes the process of socializing them to engage with a "democracy of ideas" and the "social justice of ideas," two of Duckworth's educational notions that are discussed later in this chapter.

Diminishing Learning and Teaching in School

Duckworth has found the growing number of educational policies in the name of "school reform" profoundly disturbing because they demand "more and more time taking tests, less and less time learning; more and more simple right answers, less and less complexity; more and more intellectual orthodoxy, less and less diversity" (Duckworth, 2012).

On the "more and more" side, the high-stakes testing movement has created a culture in which achievement test scores are interpreted as a reflection of children's learning and the quality of teachers' teaching. This kind of test-driven schooling offers an education that reduces or rejects diverse creativities of human learners, but elevates or enhances the values of uniform thinking toward correct answers. The high-stakes testing movement pivots on various forms of testing mandated by each state or by the Common Core Standards across states. For nearly two decades, the consistently mounting political pressure for this type of educational accountability measure can be seen in the federal programs, "No Child Left Behind" and "Race to the Top." Along with everything else, Duckworth (2012) finds these two slogans blatantly—and hilariously—contradictory! Racing without leaving anyone behind! However, what is entirely missing is the students' right to a good education, an education in which students are active learners, complex thinkers, and confident human beings.

Duckworth (2016) lamented, "Politicians keep meddling with education. Education is no longer in the hand of educators, no longer in the hands of teachers, parents and communities." This observation echoes a wide range of discussions on school reform and school learning in which teachers have tried to have their voices heard (e.g., Au, 2011, 2013; Cochran-Smith, 2000; Darling-Hammond, 2015; Hilliard, 2000; Hursh, 2013; Nichols, Berliner, & Noddings, 2007). Regardless of the growing strength of these professional voices against standardized testing, they do not seem to slow the top-down push of the standardization movement. Educators have less and less say about how to teach and what to learn. Duckworth observes, "To the extent that the testing has prevailed, what education should be has not happened" (Duckworth, 2016).

Educational Constructivism

For many people, constructivist education may be a vital movement that falls on the "less and less" side in the face of school reform movements such as high-stakes testing. In an interview in 2016, I asked Duckworth whether she could define what educational constructivism was. She found it hard to answer the question even though she was no less familiar than anyone else with constructivism in the tradition of genetic epistemology. In the field of education, the word "constructivism" is used in so many ways she felt uncertain what people are asking when they ask what educational constructivism is. "It wouldn't be easy to answer. Constructivism is a word that I see can legitimately apply to Piaget's theory. Then, in education, there are so many different ideas about constructivism. The variety of *practices* that are called constructivist keeps me from using the term" (Duckworth, 2016).

Although Piaget and Inhelder's work has been the most significant source of theoretical and methodic inspiration for her educational innovations, Duckworth (1973) struggled in the field of education for years to ask questions about whether their work could inform learning, and how their work could be useful to teachers. Reflecting on Piaget's theory while working in the trenches for decades, she has observed various beliefs and attempts to apply Piaget's constructivism to education that are detached from the intellectual development that teachers and students should have. "Piaget's constructivist ideas have not had the great impact on education that they should have because people did not understand them. Some people tried to teach kids to do Piaget interviews better. So that was not what he had in mind. Some people encourage kids to come up with their own ideas, but make sure those ideas are replaced by 'right' ideas in the end. They try to make sure that children do not go home at the end of the day with 'wrong' ideas. So that is not very useful in giving learners a sense of confidence in their own ideas. Learners don't get to learn to be confident in their own ideas because they still check out their ideas against whether the teacher says they are right or wrong" (Duckworth, 2016).

Critical Exploration in the Classroom

Although the constructivist education movement quietly arose in the 1970s (Hsueh, 1995) and caught on in the 1990s, as seen in official statements by a variety of professional education organizations,[1] Duckworth rarely uses the word constructivism to characterize her work, but "I can talk about my

own principles of teaching" (Duckworth, 2016). This approach has inherited the name of "critical exploration"—the name Inhelder, Sinclair, and Bovet (1974) gave to the Genevan research approach (also see Duckworth, 2005b; Hsueh, 2005b). Duckworth combined this name with the phrase "in the classroom." She said, "Because I believe that that very research approach can be a productive classroom teaching approach" (Duckworth, 2016). The learner is engaged in learning the subject matter while the teacher learns about the learner's thinking in order to understand the student's grasp of the subject matter.

"I am going to talk about our work in Critical Explorers." By "our work," Duckworth referred to her recent involvement with a group of former graduate students who are currently university professors, public school teachers, and school administrators. This work of critical exploration has a central principle, that is, "We work on trying to have teachers not come between students and the subject matter. The teacher's job, our job, is to get the learner right into the midst of the subject matter. That means, the primary material, the curriculum material, has to be very well selected so that it captures the attention of a variety of learners, and also – in the course of the curriculum study – it offers a way for the learners to find the big ideas in the subject matter. That means that a lot of good work has to be put into the curriculum so that learners themselves can form ideas without the teacher saying, 'Here is the idea you should be getting from this one'" (Duckworth, 2016).

A good number of studies have documented how teachers and students have done critical exploration in the classroom. In addition to some of her publications of late (Duckworth, 2001, 2005a, 2005b, 2009, 2010), interested readers can find specific examples in the studies by many others who have helped to advance the critical exploration approach (e.g., Auger, 2014; Cavicchi, 2007, 2008a, 2009; Chiu, 2009; Hughes-McDonnell, 2009; Rauchwerk, 2003).

Many Wonderful Ideas in Progress Versus a Few Right Ideas in the End

Following Duckworth's work over time, one can find a clear approach to learning and teaching that had already emerged in the year of *Piaget Rediscovered*: The teacher can best engage learners by following the learners' ideas and keeping the ideas in direct interaction with the subject

matter. Prioritizing the students' own ideas is also to acknowledge and honor the diversity of ideas in the classroom. With a range of ideas in one classroom, both the teacher and the students can move their ideas forward by engaging with one another's ideas about the subject matter. This early emphasis pivots on the teacher's sensitivity to learners' ideas, or as Duckworth (1973) noted, "The sensitivity to children in classrooms continued to be central in my own development" (p. 262). This thinking runs against the perennial baffling issue of applying Piaget's stage theory to education and educational psychology, an effort that is still prevalent in many colleges of education. In an essay entitled "The having of wonderful ideas," Duckworth (1973) offered her hard-earned insight as follows:

> I am suggesting that children do not have a built-in pace of intellectual development. I would temper that suggestion by saying that the built-in aspect of the pace is minimal. The having of wonderful ideas, which I consider the essence of intellectual development, would depend instead to an overwhelming extent on the occasions for having them. (p. 275)

The occasions for having wonderful ideas is essential for the learner's continuous intellectual engagement with the subject matter, and for all students in the classroom to engage with one another's ideas about the subject matter (Duckworth, 2005a, 2005b, 2010). Central to both the curriculum and the pedagogy is the teacher's conscious effort to help learners continually happen upon these occasions. In other words, it is essential for learners to have their own ideas; it is also essential for the teacher to be sensitive to the rise and development of these ideas in order to be part of these intellectual occasions, to notice them, to join with the learner, and to follow along with the progress of the ideas.

In contrast, an activity in the classroom that leads to a set of "correct" ideas not only promotes a narrow sense of learning, but also promises a time-tested negative consequence in learners' loss of interest in the subject matter, and loss of confidence in their own ability to learn. Regarding this common phenomenon in school, Duckworth observes, "Making sure that learners come to the right answer is destructive most of time. You want learners to keep having questions, not to get simple answers which make them think they know it. I find that students can be very involved in some matter, struggling with making sense, and then if someone tells them 'this is the answer,' they lose interest. And then, also, they develop less and less confidence in their own thinking abilities" (Duckworth, 2016). Consider

that when students make earnest efforts to learn something and then an authority figure concludes with established ideas that largely override the students' own developing ideas, this inevitably minimizes their interests and disrespects students' intellectual development.

What Materials Are Suitable for Critical Exploration?

"Wonderful ideas" cannot come out of the blue. They originate from what learners discover in their environment and experiences, such as they find meaningful and connectable to the activity in the classroom. In order to make it possible for all learners in the classroom to have their own wonderful ideas, a thoughtful selection of curriculum materials is key. What materials are considered to be suitable for critical exploration in the classroom in order to help students develop their own wonderful ideas? Duckworth (2016) answered this question by examining the intended materials based on the principles that they are accessible to everyone and rich in possibilities. She said, "[The materials] have to allow many routes in – and be full of interest once you are in there. There have to be enough materials backing up the activities so that learners can go deeper and deeper in the subject matter. Different people will get different things. Material that makes people do the same thing is not very valuable" (Duckworth, 2016).

However, it is not always realistic for classroom teachers to go out to look for such materials. Designated educators who are well versed with teaching and learning principles like those in critical exploration should come to help. Duckworth suggests, "It's not the only way to help teachers, but it is a very important thing. What educators who are not classroom teachers should do is develop curriculum materials for teachers. Teachers do not have time to do all the searching that is needed for good curriculum – for curriculum in which students are historians who work from primary sources; scientists who explore first-hand phenomena; mathematicians who invent their own ways to solve problems, and so on. We need curricula that put learners in touch with subject matter. If I were a superintendent, that is what I would hire people to do: Find curriculum materials and questions that put teachers and learners in touch with subject matters" (Duckworth, 2016).

Encounter Between Materials and Students

Once the carefully selected materials for critical exploration become available to the teacher, how should the teacher use the materials? Pedagogically, there are many specifics worth mentioning, but one principle is foundational: The teacher should not get in between materials and students but instead must place students directly in touch with the subject matter by working arduously to keep them connected with it. "I consider teaching to be helping people learn, not telling people what you know. The key as I have seen is to aim for putting learners directly in touch with the subject matter, *not with words about* the subject matter. It's not a matter of mediating between the subject matter and the learners. It's not a matter of telling them how to think about it. But keeping learners directly in touch with the subject matter itself and the subject matter becomes the authority" (Duckworth, 2012, italics added).

In stark contrast to Duckworth's approach, the ubiquitous instructional approach in school is telling students the correct answers and explaining what they should learn. It is a norm for teachers to explicate widely accepted mathematical formulas, laws of physics, equations of chemistry, and grammatical rules, that is, to use words to impart knowledge. To illustrate her own approach, Duckworth (2012) cited an example of a 9th grade English teacher teaching poetry in a Boston high school to students of English as a second or third language, who were enrolled in the lowest of four tracks in school. Lisa Schneier (2001), the teacher, worked with these students by helping them expand and deepen their own encounter with the text of the poem. To do this, the teacher stood to one side in the encounter between students and text, not in the midst of it. In so doing, Schneier noted the growing interest of the students and "the palpable intelligence that creates those ideas and propels them into new ones as the students create their own deep and secure knowledge of this poem" (p. 46).

Duckworth (2012) reiterates this position: "I want to emphasize how the poem was the authority here, not the teacher. The teacher had hard work to do, but it wasn't the work of explaining her own ideas, or those of a textbook, or the literary authorities. It was the work of keeping the students connected to the poem itself. She had faith in the power of a good poem, and she had faith in the power of her students' minds, and that double faith brought the students to the very heart of the matter, the very nature of poetic use of language."

Democracy of Ideas in the Classroom

Students' direct encounters with the subject matter allow them to forge their own routes into the material to bring forth their ideas. Then, how do the teacher and other students treat these ideas? In the test-driven method, only "correct" answers are honored. Duckworth found this troubling because it does two injustices to learners: to their ideas and to their citizens' rights.

In our recent interview, Duckworth shared her current view on education as she thinks it ought to be. It was the first time that I heard her discussing her new phrase "democracy of ideas." The phrase itself seems simple to grasp but it is not an easy educational practice to implement in the classroom. First, here is the meaning of the phrase:

> In the classroom, an idea should not get greater attention because it is the teacher's idea, the smart kid's idea or the idea in the book or on Google. My view of democracy of ideas in the classroom, also my thought about social justice in the classroom, is that no matter who puts forth an idea, that idea gets attention. Maybe it does not hold up, but if it is submitted with a serious intent, it has to be dealt with and considered as whether it will stand up with other ideas we have had so far. Do we need further evidence to see if it will work or not? Does it contradict something else? If so, what will it be that settles that contradiction? Or it could easily be dismissed quickly because everybody agrees that couldn't be the case because of X, so that the idea could be dropped and the person who proposed could realize, "Oh I see it has to be dropped." But as long as an idea has got some possibility to it, it is on the table for a continuing discussion, and the discussion needs to consider it before dropping it to go on to some other topic. Teaching this way, learners get to develop respect for their own ideas – which is of central importance to many students; and they get to develop respect for each other's ideas – which is of central importance for all students and for society at large. (Duckworth, 2016)

It is worth noting that most schools do not practice or promote such democracy in their classrooms. Although students' ideas can be considered as their starting points in learning, they are not given a chance to be engaged with others' ideas, and not necessarily treated as valid in the end. The officially correct ideas will rule; the high-stakes testing environment does not allow diverse ideas to interact with one another to work themselves out,

but demands that systematic efficiency govern students' own development. Little room is available for a socially engaging intellectual process.

This process acknowledges every individual's idea in his or her learning effort as a serious foray into the subject matter, and into a shared experience among learners present. It also calls for learners to make connections to ideas already shared. All ideas from learners, just like all learners are human beings, are on equal footing. Thus, the bottom line in teaching is that "an idea is not to be discarded because of the person it came from. It will be considered no matter who says it – unless the person who puts it forward is not taking it seriously" (Duckworth, 2016).

Where can people find democracy of ideas in classroom practice? There could be a long list of examples, and Duckworth mentioned a few in her interview: Constance Kamii's (1982) arithmetic classes; Elizabeth Cavicchi's (e.g., 2008b, 2009) history of science and contemporary science learning; Alythea McKinney's (2005) history classes in elementary school; and Lisa Schneier's (2015) graduate course on teaching and learning. "So what I call the democracy of ideas seems to me an important element of the climate in the classroom. As ideas are accepted democratically, the *person* also tends to be accepted democratically. We will get more respect for people along with all these respected ideas" (Duckworth, 2016).

Teaching and Learning: A Way of Living for the Present

Critical exploration in the classroom prioritizes the ideas of all learners because such ideas are the essence of intellectual development. Trying to figure things out often means struggles, confusion, and uncertainty along with playfulness, openness, and readiness to embrace the complexity of the subject matter. All these are the important characteristics of genuine learning and teaching that derive from that starting point of learners and teachers figuring things out (Duckworth, 2012).

However, politicians and educational bureaucrats often set their eyes on education to prepare students for the next grade and for future employment. For example, on the eve of the statewide annual standard tests in Tennessee schools, called TNReady, the governor sent out a warm and encouraging letter to every student in the state with a B2 pencil and this opening statement: "Whenever I visit a Tennessee classroom, I am impressed and inspired by the hard work our students and teachers are doing. Across the state, I see students learning what they need to know for the next grade and for success in life after high school" (Haslam, 2017).

Important as these future goals are, there is little concern about how students should value their own learning and respect one another's ideas; about what teachers do to help students learn; and about the social justice of allowing everyone's ideas about the subject matter to be considered in the classroom.

In her address to a large audience, Duckworth (2012) responds to the increasingly difficult situation in which teachers find themselves in school: "I'd like to say that teachers are being deprived, not only of their professional dignity, but for me, even more regrettable, of knowing the joy that their work could bring them." If teachers are not respected for their professional dignity and their joy in teaching and learning, can we expect students to be socialized to respect one another's ideas and value one another's creative minds?

Concluding Remark

Recall the three assumptions Duckworth states at the start of this chapter: teaching and learning in the classroom are all about developing the power of students' minds, and of their creative capacities; about helping students become confident and complex thinkers; and about building in them a sense of community responsibility, democratic commitment, and social justice. In contrast to what learning is supposed to be in the high-stakes testing environment, Duckworth (2012) calls for a different kind of reform in education, a return of joy to learning and teaching:

> Drawing students into your subject matter, seeing what their ideas are, witnessing the struggles, the insights, the perseverance, the playfulness, often enriching your own point of view with theirs. It is engrossing, and fascinating, and exhilarating. I wish it for you, and I wish it for children and teachers in our schools right now.

Note

1. In the United States, professional education organizations issued guidelines incorporating different shades of constructivism, such as *the Curriculum and Evaluation Standards for School Mathematics* (NCTM, 1989), *The National Science Education Standards* (National Research Council, 1996), and *Innovations in Science Education Survey Instrument* (BSCS, 1994). In other

Western countries, "The New Zealand National Science Curriculum is heavily influenced by constructivist theories and ideals. . . .Comparable documents in Spain, the UK, Israel, Australia, and Canada bear, to varying degrees, the imprint of constructivist theory" (Matthews, 2002, p. 122).

References

Au, W. (2011). Teaching under the new Taylorism: High-stakes testing and the standardization of the 21st century curriculum. *Journal of Curriculum Studies, 43*(1), 24–25.

Au, W. (2013). Hiding behind high-stakes testing: Meritocracy, objectivity and inequality in U.S. education. *International Education Journal: Comparative Perspectives, 12*(2), 7–19.

Auger, J. L. (2014). The author has the last word: Buddy editing in a first-grade classroom. *Harvard Educational Review, 84*(3), 367–384.

Biological Science Curriculum Study. (1994). *Innovations in science education survey instrument*. Colorado Springs, CO: Biological Science Curriculum Study.

Cavicchi, E. M. (2007). Mirrors, swinging weights, lightbulbs. . .: Simple experiments and history help a class become a community. In P. Heering & D. Osewold (Eds.), *Constructing scientific understanding through contextual teaching* (pp. 47–63). Berlin, Germany: Frank & Timme.

Cavicchi, E. M. (2008a). Opening possibilities in experimental science and its history: Critical explorations with pendulums and singing tubes. *Interchange, 39*, 415–442.

Cavicchi, E. M. (2008b). Historical experiments in students' hands: Unfragmenting science through action and history. *Science and Education, 17*(7), 717–749.

Cavicchi, E. M. (2009). Exploring mirrors, recreating science and history, becoming a class community. *The New Educator, 5*(3), 249–273. https://doi.org/10.1080/1547688X.2009.10399577

Chiu, S. M. (2009). The ancient master painted like me. *The New Educator, 5*(3), 229–248. https://doi.org/10.1080/1547688X.2009.10399576

Cochran-Smith, M. (2000). Gambling on the future. *Journal of Teacher Education, 51*(4), 259–261.

Council of the Great City Schools. (2015). *Student testing in America's great city schools: An inventory and preliminary analysis*. Washington, DC: Council of the Great City Schools.

Darling-Hammond, L. (2015). Can value added add value to teacher evaluation? *Educational Researcher, 44*(2), 132–137.

Dewey, J. (1916). *Democracy and education*. New York: Macmillan.

Duckworth, E. R. (1973). The having of wonderful ideas. In M. Schwebel & J. Raph (Eds.), *Piaget in the classroom*. New York: Basic Books.

Duckworth, E. R. (1996). *"The having of wonderful ideas" and other essays on teaching and learning* (2nd ed.). New York: Teachers College Press.
Duckworth, E. R. (2000, March 11). Interview by Y. Hsueh. Cambridge, MA.
Duckworth, E. R. (Ed.). (2001). *"Tell me more": Listening to learners explain*. New York: Teachers College Press.
Duckworth, E. R. (2005a). A reality to which each belongs. In B. S. Engel (Ed.), *Holding values: What we mean by progressive education* (pp. 142–147). Portsmouth, NH: Heinemann.
Duckworth, E. R. (2005b). Critical exploration in the classroom. *New Educator, 1*(4), 257–272. https://doi.org/10.1080/15476880500276728
Duckworth, E. R. (2006). Introduction. In *"The having of wonderful ideas" and other essays on teaching and learning* (3rd ed.). New York: Teachers College Press.
Duckworth, E. R. (2009). Helping students get to where ideas can find them. *The New Educator, 5*(3), 185–188. https://doi.org/10.1080/1547688X.2009.10399573
Duckworth, E. R. (2010). The soul purpose. *Learning Landscapes, 3*(2), 21–28.
Duckworth, E. R. (2012, February 16). *Confusion, play and postponing certainty*. Cambridge, MA: Harvard Thinks Big. Retrieved from http://news.harvard.edu/gazette/story/2012/02/confusion-play-and-postponing-certainty-eleanor-duckworth-harvard-thinks-big/
Duckworth, E. R. (2016, April 26). Interview by Y. Hsueh. Memphis, TN.
Gordon, D. T. (2003). Introduction. In D. T. Gordon (Ed.), *A nation reformed? American education 20 years after A Nation at Risk*. Cambridge, MA: Harvard Education Press.
Haslam, B. (2017, April 10). *Letter to Tennessee students*. Nashville, TN: State Capital.
Hilliard, A. (2000). Excellence in education versus high-stakes standardized testing. *Journal of Teacher Education, 51*(4), 293–304.
Hursh, D. (2013). Raising the stakes: High-stakes testing and the attack on public education in New York. *Journal of Education Policy, 28*(5), 574–588.
Hsueh, Y. (1995). *From Piaget to pedagogy: A brief history of constructivist teaching movements*. Qualifying paper. Cambridge, MA: Harvard Graduate School of Education.
Hsueh, Y. (2005a). The lost and found experience: Piaget rediscovered. *The Constructivist, 16*(1). (Refereed electronic journal of the Association for Constructivist Teaching).
Hsueh, Y. (2005b). Critical exploration in the classroom: Its past and present. In D. Wallace (Ed.), *Education arts, and morality: Creative journeys* (pp. 121–141). New York: Kluwer Academic.
Hsueh, Y. (2009). Jean Piaget in the United States, 1925–1971. In U. Müller, J. M. Capendale, & L. Smith (Eds.), *The Cambridge companion to Piaget*. Cambridge, UK: Cambridge University Press.

Hughes-McDonnell, F. (2009). I wonder how this little seed can have so much potential: Critical exploration supports preservice teachers' development as science researchers and teachers. *The New Educator, 5*(3), 205–228. https://doi.org/10.1080/1547688X.2009.10399575

Inhelder, B., Sinclair, H., & Bovet, M. (1974). *Learning and the development of cognition*. Cambridge, MA: Harvard University Press.

Kamii, C. (1982). *Number in preschool and kindergarten*. Washington, DC: National Association for the Education of Young Children.

Layton, L. (2015, October 24). Study says standardized testing is overwhelming nation's public schools. *The Washington Post*, Education Column. Retrieved from https://www.washingtonpost.com/local/education/study-says-standardized-testing-is-overwhelming-nations-public-schools/2015/10/24/8a22092c-79ae-11e5-a958-d889faf561dc_story.html?utm_term=.c027847ec710

Matthews, M. R. (2002). Constructivism and science education: A further appraisal. *Journal of Science Education and Technology, 11*(2), 121–134.

McKinney, A. (2005). *Using women working resources in schools: A case study*. Cambridge, MA: Harvard Graduate School of Education.

National Council of Teachers of Mathematics. (1989). *Curriculum and evaluation standards for school mathematics*. Reston, VA: National Council of Teachers of Mathematics.

National Research Council. (1996). *National science education standards*. Washington, DC: National Academy Press.

Nichols, S. L., Berliner, D., & Noddings, N. (2007). *Collateral damage: How high-stakes testing corrupts America's schools*. Cambridge, MA: Harvard Education Press.

Rauchwerk, S. (2003). *Incubating knowledge: A narrative account of eight teachers studying chickens*. Qualifying Paper. Cambridge, MA: Harvard Graduate School of Education.

Ripple, R. E., & Rockcastle, V. N. (Eds.). (1964). *Piaget rediscovered*. Ithaca, NY: Cornell University Press.

Rogoff, B. (2003). *The cultural nature of human development*. New York: Oxford University Press.

Schneier, L. (2001). Apprehending poetry. In E. R. Duckworth (Ed.), *Tell me more: Listening to learners explain* (pp. 42–78). New York: Teachers College Press.

Schneier, L. (2015). *T-440 teaching and learning: "The having of wonderful ideas."* Retrieved from http://www.gse.harvard.edu/course/fall-2015/t440-teaching-and-learning-having-wonderful-ideas-fall-2015