

## Joe L. Kincheloe: Embracing criticality in science education

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**Abstract** This article reviews significant contributions made by Joe L. Kincheloe to critical research in science education, especially through a multimethodological, multi-theoretical, and multidisciplinary informed lens that incorporates social, cultural, political, economic, and cognitive dynamics—the bricolage. Kincheloe’s ideas provide for a compelling understanding of, and insights into, the forces that shape the intricacies of teaching and learning science and science education. They have implications in improving science education policies, in developing actions that challenge and cultivate the intellect while operating in ways that are more understanding of difference and are socially just.

**Keywords** Critical science education · Bricolage · Postformalism · Hermeneutics · Critical ontology · Critical consciousness · Critical pedagogy · Critical constructivism

Joe’s greatest attribute is that he walked the walk. He was almost unique in being able to listen to what you were saying without projecting his own ideas and identity into the conversation. He was rare in identifying the kernel of the idea and encouraging you to grow your ideas in your own ways. He was encouraging and embraced many perspectives. Unlike many authors who write abundantly, Joe was a careful and wide reader who was open to others’ ideas (Kenneth Tobin).

In the fall of 2002, at CUNY’s Graduate Center, a small group of newly enrolled doctoral students gathered together with Joe Kincheloe to begin their journey of becoming critical scholars in the field of urban education. Five of those students, of which I was one, were pursuing degrees with specializations in science education. As a group, we became well aware of our varied interests and backgrounds, as we took the first few weeks of our colloquium to share our stories and articulate our dreams and goals. At that time, we were unaware of what was on the cusp of developing—Joe began to set the stage for each of us to become more cognizant of the forces that helped to shape our understandings of our

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epistemologies, ontologies and personal experiences. We were on the road to developing an understanding of how new and multiple tools and methodologies afford deeper understandings of our individual and collective educational histories. We had begun to develop the theoretical lenses of bricoleurs, relating stories grounded in a myriad of theories including feminism, subjugated and indigenous ways of knowing, African–American and other ethnic ways of seeing, and morals and ethics. Joe also shared his own personal insights related to schooling, the politics of economics, classism, racial and ethnic concerns, and immigration as a means to caution against the dangers of determinism.

Raised in the mountains of Tennessee in a democratic household (an unusual occurrence in the 1950s and 1960s), Joe used music while in high school, to bring many different types of people together—as a jazz and blues musician and songwriter. At a young age, Joe was already consciously political and passionate about his dislike of segregation and the ill treatment of those who were less fortunate. When pondering on how his talents might serve him in a career, his high school counselor wasted no time in telling him that his aptitude test results pointed toward vocational school. After all, she insisted, given his ethnic background and at that time a mediocre high school academic profile, she assured him that he would never amount to more than a piano tuner (Shirley Steinberg).

I am constantly taken aback at the ease at which talents are trivialized, inscriptions are constructed, and deterministic views are made of students, especially those who have been marginalized for one reason or another. In my experience as a Black female science educator, I have been forced to confront such issues in ways that I had not imagined prior to my tenure as an urban science teacher. Joe’s formal lessons, his insistence on developing a reflective teaching persona, his writings about what it means to be a reflexive scholar and practitioner, in addition to his numerous personal stories have all influenced my way of being and my work.

### **Postformalism: The production of subjectivity, meaning, emancipation and self**

It is through the nurturing and cultivation of the human spirit, that Joe helps us to conceptualize a greater understanding of how non-Cartesian forms of knowledge production and research methodologies can address the complexities of teaching and learning in science education. To this end, Joe provides insights into the advantages of employing a postformalist lens. He explains that postformalism seeks to understand a critical ethics of difference found in the complexity of everyday life. Invariably, we encounter individuals with differing values and points of view around science content and teaching and learning. We are encouraged to seek value in contradictions and in the nontraditional, so long as that which is different is not harmful to the welfare and/or interests of others. Postformalism resonates with emancipatory goals, in that it encourages autonomy and an expansion of human agency, affording richer insights into phenomena than other constructions by insisting on intellectual rigor and internal consistency. Finally, postformalism can be a hedge against reductionism, exploring “alternative meanings offered by others in similar circumstances...When researchers fail to discern the unique ways that historical and social context make for special circumstances, they often provide a reductionist form of knowledge that impoverishes our understanding of everything connected to it” (Kincheloe 2005, p. 158).

Much of Western science has been grounded in a belief system that was formulated during the sixteenth and seventeenth centuries and encourages the need to separate the knower from the known. In so doing, we ‘legitimize’ the notion that we (the knower) know and experience the world of science objectively. We have often been taught that science is ‘pure’ and ‘untainted.’ Joe challenges us to critically examine and evaluate this notion. Through critical evaluation he addresses the need to create a strong, liberating, healthy knowledge foundation, which respects and acknowledges diversity in its multi-layered contexts, embellishing ways of “thinking and knowing”. Jennifer Adams, a Brooklyn College colleague shares some of her struggles and insights.

I was working in a museum while I was completing my doctorate at the Graduate Center where Joe was one of my professors. Although I love museums, for me the museum became a space that represented Cartesian dualism—the separation of the knower and the known—that Joe often discussed in class. I realized that the museum is steeped in a culture of Western Modern Science and is often viewed as the only valid way of describing and understanding the natural world. Things had to be discovered, identified, categorized, named, embalmed, and stored. Although I marvel at the objects and the science behind the objects, I always felt a sense of disconnection between the scientific descriptions and placements of the objects, and how they were situated in their local contexts. It also made me think about the cultural halls—how traditional peoples and their artifacts were relegated to the same scientific treatment of the biological and geological objects in the scientific halls. Feeling this sense of subjugation to a Western description of traditional cultures, I developed activities to decolonize the objects in the halls; activities that allowed teachers to value cultural objects in terms of the complex knowledges that the developers had about their natural world. The process of decolonization also enabled the teachers to view their own cultures and those of their students in ways that valued their cultural worldviews as equal to a scientific worldview. I began to see my role as a science educator as bridging the cultural gaps between Western Modern Science and traditional knowledge and making others aware of the value that traditional knowledges have to the scientific and science education communit(ies).

Postformalism is not only an empowering referent in science education—it is also being used, for example, by Bal Luitel, who noted that Joe’s perspectives helped in the development of, “...transformative visions for an inclusive mathematics education in Nepal. This particular idea of Joe’s, helped me to conceive of alternate thinking (logics) and expressions (genres) with which to articulate complexities enshrined in the process of transformative vision making”. Tricia Kress, from the University of Massachusetts in Boston, also used Joe’s idea of postformalism with her doctoral students. She writes:

In the work I do with my students and within my own scholarship, I am profoundly skeptical of the ways in which my own conceptions of the world influence the opportunities I afford students for producing their own knowledge. Kincheloe’s work on the bricolage compels me to draw from many schools of thought and methodologies of conducting research in order to help students dialogue with theory and research in order to develop the best paths, designed by them and for them, to begin to conduct research and improve their teaching and leadership practices in urban schools. Rather than asking students to blindly accept and apply the theories and methods that I have chosen to drive my own scholarship, I ask that students learn to

develop a heightened consciousness about themselves, who they are, where and with whom they are working, and what they want to accomplish with their research in order to design research that is fair, ethical and has meaning in their lives as practitioners.

### Values and ethical concerns in science and science education

In his book, *Getting Beyond the Facts* (Kincheloe 2001), vital information, pragmatic tools and constructive criticisms are proposed for education. What engenders empathetic and action-centered pedagogues to work toward inclusivity and change within our increasingly diversified and complex twenty-first century is detailed here. Joe charges us to understand the principles of critical enlightenment, emancipation and empowerment, reject the notion of economic determinism, and dig deeper into the complexity of the human psyche so that we may become more critically aware of the world in which we live. Additionally, he urges teachers and learners to “examine not only the popular domain, but the hidden rules that shape cultural production in general” (Kincheloe 2001, p. 146). The idea of building communities of solidarity and challenging assumptions about politics, culture, psychology, human potential, economics and the like are essential to the construction, growth and metamorphosis of a pedagogy rooted in integrity and truth. Lily Settelmaier, from Curtin University, who has researched the transformation of the culture of teaching and learning in science through ethical dilemma stories, provides the following insights into Joe’s work related to teachers’ senses of moral agency.

In a world where the possibility of ‘pure’ science still exists for some; in a world where science is still regarded as ‘value-free’ by some; in a world where scientific content knowledge and its transmission still prevail; in such a world the raising of awareness about values and ethical concerns in relation to science, scientific research and its uses is still bordering on heresy. Joe’s work has profoundly influenced my thinking and research practice in many ways since it was in the critical constructivism promoted by Joe that I discovered a powerful theoretical referent for my research on socially responsible science classrooms in which ethical dilemma story pedagogy helps create learning environments that are conducive to not only the critical analysis and discussion of ethically contentious issues in relation to science and its uses but that also provide ample opportunity for students’ identification with and reflection on ethical dilemmas. Joe’s work illustrated to me how the emancipatory interest inherent to socially responsible science education research becomes evident through the deconstruction of distortions and hidden science curricula traditionally perpetuated by scientific, objectivistic worldviews. In other words, through the deconstruction of uncritical cultural reproduction, Joe’s work helped me understand that it is through an enhanced sense of moral agency that teachers of socially responsible science concern themselves with establishing communicative classroom environments in which flourish discourse practices of critical inquiry.

### Students, teachers and curriculum

Two important considerations at the core of Joe’s work in, *Critical Pedagogy Primer* (Kincheloe 2004) are (a) the need for educators to take very seriously the dynamics and

complexities of their students and (b) the need for an *impassioned spirit* and the expression of *radical love*.

It is through the enactment of critical pedagogy that suffering often experienced by students because of their own challenges and failures is assuaged. Critical science pedagogy is very liberating, especially when we consider that it is not uncommon for students, particularly those who have been marginalized, to become estranged from the content. The notion of critical pedagogy that Joe has worked toward is grounded in many important generative themes detailed in the Brazilian critical educator Paulo Freire (1970). One idea that Joe spoke of in relation to Freire's work on critical pedagogy involved interactions of teachers and students with curriculum. He stressed that instead of curriculum being viewed as a body of data that is "banked" into the minds of students; it should be generated as themes that are central to their oppression. As such, the curriculum should be meaningful to students, incorporating political dynamics, as a means to address and alleviate oppression. It should have liberatory impulses in that it connects with students' passions and brings them to a new place through the schooling experience. Hence, a critical science teacher will have a body of knowledge to bring to the world and share with her students. She uses smart teachable moments to bring her own multilogical characteristics—her historical background, context of knowledge and interpretive information—to the table, bringing new insights about science at a cognitive level.

Joe often recalled his first meeting with Freire in a Portuguese restaurant close to Harvard University where they spent hours talking about the significance of radical love in education. What was revealed in that conversation was that education has as much to do with the teachable heart as it does with the mind. It is not uncommon for this notion to get lost within the complexities of education, and can become especially challenging within cultures of positivistic science education. Joe describes the nature of radical love and its fusion with critical pedagogy by saying that, "nothing is impossible when we work in solidarity with love, respect and justice as our guiding lights" (Kincheloe 2004, p. 3).

Joe pointed out that, while the Frankfurt School was the first to use the term "critical pedagogy," W. E. B. Du Bois' writing, *The Souls of Black Folk* (Du Bois 1903), lays down, with tremendous specificity, the theoretical conceptual points found in the Frankfurt School in the 1920s (Kincheloe 2004). An evolving criticality is one that makes critical pedagogy relevant in the twenty-first century and culls out opportunities to learn from forces that shape education globally. There is much to learn, for example, from critical feminism, postcolonial studies, Latin American studies, and Muslim studies. Critical theory and critical pedagogy are dynamic and always evolving—addressing the needs of those who are oppressed and suffer because of their oppression. Critical pedagogy provides ways to make meaning of those structures that inform every part of the pedagogical process. Sumi Hagiwara, from Montclair State University, teaches about diversity and culture, and science, math, and technology to pre-service early childhood and elementary teachers. She talks of Joe's influence on her evolving understanding of critical science education.

Joe informed my views of critical science education with his analysis of positivism and knowledge construction, reflecting on teaching as inform-to-transform the trajectory of students' social and political identities. I continue to be influenced by Joe's undaunted critique of the political/power structures in all its complexities. In pursuing my interests in cultural studies, I revisit Joe's work to examine his

interpretation of ethnic studies through bricolage, informed by complex inscriptions of power and the ways they promote social and cultural inequality. Joe's work as critical theorist was salient in multiple disciplines as he tirelessly pursued his passion to examine and understand how society engages/disengages individuals, and used epistemology in each discipline to analyze the justice and injustice that emerged from social engagement. Joe was unflappable in the face of complexity, he almost seemed to consume it as it energized his will to de-stifle what was complex and interpret it with great clarity for his audience to not only be inspired, but to pursue the work that lay ahead.

In 2006, Joe founded The Paulo and Nita Freire International Project for Critical Pedagogy at McGill University. The Project is a one of a kind virtual and literal archive of global initiatives in critical pedagogy that is deeply committed to the study of oppression in education. It is especially focused on how issues of race, class, gender, sexuality, and colonialism shape the nature and purpose of education. In the spirit of Freire's work, Joe understood the project as a means to support an evolving critical pedagogy that encounters new discourses, new peoples, with new ideas, and continues to move forward in the twenty-first Century. The project is understood as being a continued evolution of the work of Paulo Freire and the empowerment of oppressed peoples.

At the heart of Joe's scholarship in critical pedagogy are hermeneutic phenomenology and the bricolage. Joe very often spoke of the notion that phenomenology—the study of the lifeworld (and as he put it, “what it means to *be* in the world”), and hermeneutics—the science and methodology of interpretation, are both embedded in a variety of educational contexts. In his primer (Kincheloe 2004), Joe posits that,

Scholars familiar with critical hermeneutics build bridges between reader and text, text and its producer, historical context and present, and one particular circumstance and another. Accomplishing such interpretive tasks is difficult, and researchers situated in normative hermeneutics<sup>1</sup> push ethnographers, historians, semioticians, literary critics and content analysts to trace the bridge-building processes employed by successful interpretations of knowledge production and culture. (Kincheloe 2004, p. 58).

The bricolage highlights the relationship between a researcher's ways of seeing and knowing and his or her personal historicity. It is because of the complexity of the lived experience that the bricoleur's task is to uncover invisible artifacts of power and culture, and document the nature of their influence not only on her own research but also on scholarship in general. Kenneth Tobin noted that Joe's research had a significant impact in science education:

Joe's chapter entitled *Critical Research in Science Education*, published in the International Handbook I co-edited with Barry Fraser, was a useful first introduction to sociocultural theory for many science educators (Kincheloe 1997). Also, in a memorable occasion that stands in my mind Joe addressed several hundred elementary and middle school teachers in Miami Florida on the topic of equity and social justice in science education (Fig. 1).

<sup>1</sup> Kincheloe defines normative hermeneutics as, “the art and science of interpretation and explanation regarding standards of behavior and prescriptions of such” (Kincheloe 2004, p. 58).



**Fig. 1** Joe Kincheloe addresses elementary and middle school science teachers at a meeting in Miami in July of 1997

### Teachers as critical researchers and scholars

Joe often spoke of using strategies that allow for epistemologies to not only recognize the complexity of the lived world but, at the same time, transform its very nature (Kincheloe 2001). He was insistent on educational researchers understanding knowledge as socially constructed. “Being” a researcher is much more complex than we may have once envisioned, as inherent in research itself are hermeneutic dimensions. An interesting point to digest, especially in the science education domain, is that no information presented to us is in a pristine state. The way in which we see the world is always contextualized, being of a multi-layered, bricolage nature, affording us approaches, many of them novel, to gain assorted perspectives related to knowledge production from varied dimensions. Researchers are encouraged to resist reductionistic research so as to avoid the reproduction of hegemonic social relations. Joe advocated William Pinar’s proposal for *currere*, a means by which the fusion of an individual’s educational experience with psychoanalysis and aesthetics provide for a richer, more complex understanding and insight into the lifeworld of the individual and, how it corresponds to (or does not correspond to) educational experience.

### Supporting the work of others

It was typical of Joe to invite junior colleagues, including doctoral students, to coauthor books and chapters. He was passionate about opening doors to professional advancement, especially for scholars from ethnic minorities. Deborah Tippins moved from Texas to South Carolina to start her first job in higher education as an assistant professor at Clemson University. As is the case with most new to the profession, she describes herself as being naïve and knowing little about the world of academe. Whether it was luck or fate, Joe, also new to the university, moved into an office directly adjacent to hers. Soon they discovered that they shared December birthdays and Native American

cultural experiences, which became the starting point for many enlightening conversations. Deborah recalls that:

Joe provided a space to exchange ideas and analyze issues of mutual concern. Through our conversations and the invitation to co-author a book with Shirley Steinberg about Einstein's views on education, *The Stigma of Genius*, Joe recognized and cultivated the potential of a junior scholar (Kincheloe et al. 1992). In the years that followed, Joe continued to make a difference in the lives of junior scholars everywhere, introducing them to the ideas of critical pedagogy and challenging them to move beyond simply embracing diversity to realize that difference is what brings meaning and creativity to our lives.

Koshi Dhingra met Joe Kincheloe while he was the Belle Zeller Chair of Public Policy and Administration at Brooklyn College. She writes that:

Rather than stay on the theoretical bench of providing well articulated works that provided great insight into the landscape of critical pedagogy and postmodern thought, Joe expanded his contributions by positioning himself, and inviting others to join him, in what is commonly referred to as the theory-practice gap. The coedited collections to which he invited me to contribute and other works he wrote, including *Toil and Trouble—Good Work, Smart Workers, and the Integration of Academic and Vocational Education* (Kincheloe 1995) represent to me the key feature that I valued in Joe: his breadth of thought and vision. He continually bridged gaps—between disciplines, between “senior” and “junior” (namely, me) faculty, between worlds (e.g., academic and vocational education; theory and practice, academic conference and rock music, etc.). Joe acted on the understanding that the world is a richer place when we are able to hear from people occupying different places in the social realms of schools, universities, and societies.

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