

Post Perspectives: The Critical Roots of Complexity- Informed Discourses in Education

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A 2003 report entitled “*The use of Complexity Science*,” was commissioned by the United States Department of Education (USDE) to explore the potential implications for using complexivist principles to transform current understandings of the educational system (Sanders & McCabe, 2003). The report recommendations highlight the transformative potential of complexivist principles to provide the knowledge and tools needed “to create a 21st century education delivery system that prepares today’s students and future generations of students to be lifetime learners, workers and citizens in a rapidly changing, complex and interconnected world” (p. 8). Is this simply more government rhetoric? Does this report offer something more than the seemingly unending bureaucratic desire to jump on the next educational “bandwagon”? The short answer is no. The long answer is much more complex and requires a deeper analysis of the influences of the modern and the radical hope of the postmodern to transform our educational structure into a truly complex system.

In our original presentation at the 2004 Complexity Science and Education Research Conference (Wells & Breckenridge, 2004) we traced the transformative potential of complexivist discourses to create educational resources that can assist teachers, students, and educational researchers to enact

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complexivist principles in their everyday teaching, learning, and research engagements. In that presentation we highlighted the development processes of two complexity-related educational resources. These resources, which included a complexity and education resource guidebook for the Society for Safe and Caring Schools and Communities, entitled "*Safe and Caring Schools in a Complex World*" (Bowsfield, et. al. 2004) and contributions to the development of the *Complexity and Education Website* (Davis, et al., 2004), were directed towards the reconceptualization of education from a complicated to a complex and emergent process. Rather than summarizing these resources, which are both available online, my intent in this essay is to provide a discussion of the theoretical perspectives, historical movements, and philosophical ideals that undergird complexity-related discourses in education.

Modernist teaching practices have had a dominating influence on educational policy, practice, and pedagogy for over the past two hundred years. In what ways can complexivist theories invite, inform, and influence educationists to re-examine the ways in which they conceptualize classrooms and curriculum? How have modern educational institutions and practices come to be constructed as closed systems of knowledge and learning (Doll, 1993)? How might we begin to re-imagine classrooms and curriculum as open and dynamic systems of inquiry, imagination, and collective knowledge (Fleener, 2002)?

A Short History of Modernism and Education

The etymological origins of the root word *modern* can be traced back to Middle French and the word *moderne*, from the Late Latin (Middle Ages) *modernus*, the Classic Latin, *modo* meaning "just now, in a certain manner," and from *modus*, "to measure" (Brambles, 2003, emphasis added). When reflecting on the rise of modernism Soja (1993) defines four important phases: (1) The age of Enlightenment – characterized by the emergence of science and reason and the unquestioned belief in a knowable, unified, objective, and unquestioned truth that can be discovered. (2) The age of revolution – most closely associated with the American and French Revolutions of the late 1700's. These revolutions paved the way for the rise of capitalism, urbanization, democratization, and the growth of the nation state. (3) Simulacrum – The image of a shadowy likeness or the notion of a false pretense that has arisen as part of the critique and analysis of momentous societal events, which include, but are not limited to the rise of Fordism, the Great Depression, World War Two, and Globalization. (4) Surrealism – The representational (simulacra) threatens to displace reality itself. Reality can no longer be a reference point. Correspondingly, conceptions of society and identity are characterized by fragmentation, multiplicity, instability, and multiple truths. Surrealism gains prominence in art, literature, and philoso-

phy as exemplified by the works of Dali, Conrad, Ginsberg, Proust, and Lyotard. The postmodern moment is born as the metanarratives of Truth, identity, and knowledge are called into question and critique.

In the modern era science and reason were positioned as a method to master nature and the self in an effort to cure society's evils. The Cartesian mind/body split divided the human and physical world in such a way that it could now be tested, quantified, and controlled. This radical shift in thinking saw the sum of the parts as greater than the whole. Newton's scientific breakthroughs in physics and calculus would help to solidify rationalism as the dominant model for understanding human society and its relationship with nature (Doll, 1993). Order and regularity became guiding principles as the quest to categorize and quantify human experience and the environment had begun. The prominent rise of Descartes' rationalism and Bacon's empiricism would also greatly influence a religious/spiritual shift away from theism to deism, which would later lead Nietzsche to famously proclaim that "God is dead" as the shift to rationalism and empiricism had gained a seemingly unstoppable momentum (Davis, 2004).

The spread of urbanization, the rise of a new working class, and the centralization of economic capital and educational resources led to the modern institution of formalized schooling—replete with its mechanistic metaphors—"brain as computer," "body as machine," and "school as corporation." The purpose of this new "modern" institution was to educate the individual, through the use of symbolic technologies, to become a productive member of industry and society. The birth of Taylorism and the rise of Fordism in the early twentieth century led to the beginnings of the bureaucratization of education into a mechanistic assembly line that saw the rise of technorationalism and scientism as the predominant paradigmatic influences in society, commerce, and notably education. Darwinian laws of nature and the radically misinterpreted notion of "survival of the fittest" became transposed onto economic systems, organizational models, social policies, and curriculum objectives. The effects of this scientized discourse are evidenced in the linear construction of schooling into discrete subjects, and traditional lesson and unit plans that are based upon the notion of a carefully planned sequential series of steps to help the learner accrue knowledge¹ (Davis, 2004).

The machinery of education saw students, based on quantifiable individual potential, sorted into pre-determined divisions or classes that were designed to draw out a student's innate potential in order to best serve the needs of society. Measurement, achievement, and accountability would firmly take hold of educational philosophy and instruction, and in turn tighten their grasp to a strangle hold for the next two centuries. The educational process became obsessed with the three R's—reading, writing, and arithmetic. Instructional methods relied heavily on rote memorization, end-

less repetition, and drills. In essence, schools became academic factories with an assembly line or banking style approach to education (Freire, 1998). Order, discipline, and governance were the defining characteristics of the classroom. The curriculum and school day were broken down and structured into discreet self-contained parts. The subjects of math, science, and language arts were abstracted and disconnected from their historical foundations and taught as autonomous units of knowledge.

Taxonomies of knowledge (Bloom) and stage theories of development (Piaget, Kohlberg) were developed to ensure that students were productive and accountable for their learning and behavior. Education was designed around modernization's vision of progress, industrialization, and achievement at all costs. Epistemic knowledge became positioned as superior to gnosis and was heralded as a triumph of linear, rational, and scientific methods. Practical everyday experiential know-how was replaced with an increasing emphasis on technical skill and scientific reductionism. The once valued space for Gnostic wisdom had been relegated to the sidelines of minor subjects such as art, drama, and music. Doll (1993) defines these scientized forms of pedagogy and curriculum as transactional, *not* transformational when he states, "scientific knowledge was not merely the knowledge of most worth, it was the only knowledge of worth" (p. 51).

According to Doll, modern day reference norms like bell curves, standardized testing, and achievement exams all represent measurements of failure. Doll suggests that these assessment tools are designed to account for what students do not know, not what they know. These assessment measures operate from a deficit model whereby the learner is constructed as a constant failure that rarely, if ever, can achieve full and complete knowledge². These scientific methods operate out of a long held belief that knowledge is a closed system that is stable, representational, rational, and knowable³. From this closed systems approach, knowledge can be contained and we can claim to have a knowledge or theory of everything. If a particular form of knowledge cannot be measured or accounted for it simply does not exist. The modernist desire for certainty is clearly evident in the quest for the new scientized holy trinity of predictability, order, and control.

Post Perspectives in Education

In their discussion of postmodernism and education, Usher and Edwards (1994) highlight the dynamic tensions that exists between educational systems that are grounded in Cartesian dualisms (and their subsequent foundational knowledge claims) with postmodern discourses that centralize a continual reflexive deconstruction and resignification of identity, power, and knowledge. How do educationists reconcile these seemingly oppositional

perspectives? How might postmodern discourses reconceptualize educational theory and practice and create a space for complexity-informed perspectives to take root? To answer these questions Usher and Edwards suggest that post perspectives can help educators to engage in a critical reflexive questioning of dominant discourses and discursive practices that (re)present totalizing perspectives.

Rather than using post perspectives to present a set of techniques or guidelines for analysis, educationists can use postmodern lenses to examine educational praxis as a social practice that privileges certain identities and hierarchies of knowledge. The goal of postmodern perspectives in education should be to resist closure and embrace the “possibility of uncertainty and unpredictability whilst recognizing difference and otherness” (Usher & Edwards, 1994, p. 30). In contrast to modernist perspectives, postmodernist theories posit that knowledge can never be controlled, precisely because it is always out of control.

At its best, postmodernist discourses provide for the possibility of disruption in the hopes that education will awake from Newton’s eternal sleep. At its worst, postmodernism might help educators to embrace traditional notions of failure as sites for fruitful and regenerative thinking. It is this postmodern promise that I will explore in the remainder of the paper.

Greene (1994) and Doll (1993), both leading influential educational curriculum theorists, pose a challenge to explore how educational research, pedagogy, and practice have traditionally valued and sanctioned research and teaching that emulates a scientific techno-rationalist approach. Greene suggests that the untroubled reliance on these mechanist approaches has failed to move beyond a positivist pursuit of universal principles that are deemed to be foundational to all knowledge claims. She argues that fundamental epistemological questions have largely been silenced at the alter of Cartesian dualisms. According to Greene, these totalizing and decontextualized approaches break down in their failure to recognize knowledge claims as situated, partial, and embodied ways of knowing that are inherently influenced by the discourses and discursive practices of patriarchy, heteronormativity, colonialism, racism, and classism (to name but a few).

In the pursuit of a genealogy of epistemological approaches, Greene outlines how historical and philosophical claims to “truth” have an often unexamined, complex, and complementary historically interdependent relationship⁴. Greene urges educational researchers and practitioners to take up and pursue “new approaches to knowing [and teaching]” (p. 451) that resist an imposed disciplinary structure and fixity. Greene posits that it is this very incompleteness that is so central to claims for embodied and situated forms of knowing and being in teaching and research. Greene challenges educators and researchers to embrace this incompleteness in an ef-

fort to develop an epistemology grounded in imagination that encourages and “enables us to devise alternative modes of being, alternative projects and solutions. It is what enables us to look beyond the ‘given’ in our experience, to envisage what might be if things were otherwise” (p. 457).

For Greene, this call to re-imagine our teaching and research practices can help us to examine and reject the either/or and the mind/body dualisms of modernist educational practices. Imagination gives us the hope to envision the different realities that are needed to create them. As Greene posits, our challenge as caring and committed educationists is to open ourselves and our students to the possibilities of an imagination in which the scientific, poetic, and aesthetic combine in a rich, open, and free interplay as we strive to create alternatives to techno-scientific metanarratives that challenge structures of disavowal in an effort to “create [more] humane communities, playful communities, at once beautiful and just” (p. 459).

Doll (1993), like Greene, describes these totalizing modernist educational perspectives as closed systems that contain deeply held epistemic beliefs that are firmly rooted in an understanding of the earth as a dead planet that operates according to linear relationships that can be discovered and controlled through Descartes’ linear reason and Newton’s analytic principles (p. 21). For educationists, these perspectives are lived out in a mechanistic epistemological approach that positions the teacher at the center of the teaching-learning interaction. Davis & Sumara (1997) outline key characteristics of this approach as the need for control, equilibrium, planning, and assessment. They, along with Doll, posit that we should think of our classrooms as open and living systems where “change, not stability is their essence” (Doll, 1993, p. 14). Open systems are characterized by perturbations, flexibility, diversity, and adaptability as they operate in the space of uncertainty and disequilibrium and accordingly engage learning as a continual process or unfolding of events. These open and “free” spaces seek to create Greene’s playful communities whereby pre-set guidelines or plans are not viewed as prescriptive endings, but rather proscriptive beginnings (Davis & Simmt, 2003).

Contemporary educational methods need to move beyond a tradition steeped in the Socratic dialogue that is designed to seek out pre-existing or “closed” facts. The real or factual is more often a process of creation rather than discovery. For example, in many of the traditional lesson plan models that are taught in contemporary pre-service education programs, students are instructed to outline the objectives of the lesson, detail how they will meet those objectives (instructional methods) and then evaluate to ensure that the objectives have been met (evaluative component) (Davis, 2004). This very linear, and modernist approach is rooted in an educational framework that positions the teacher as the one who instills knowledge, rigor, and discipline into students. Based upon this model, learning is positioned as an

end result (defined by measurement) that is conceptualized as being outside of the student.

Doll (1993) describes these methods and the curriculums that they are built around as transactional approaches. These “banking style methods” break down knowledge into discrete units of study, and the units into even more discrete individual lessons that are allotted specific amounts of time for subject mastery. Whereas, Doll posits, a transformational model is composed of engagements and interactions that are not strictly time dependent. These transformational approaches recognize the importance of variety, creativity, and the need for unstructured play and interactivity as important, if not vital, aspects of learning. In the current curricular model these spaces for creativity and play (spaces of being, becoming, and belonging) are often only found in the in between or liminal spaces or gaps that exist between formal knowledge and disciplinary structures.

In a contemporary discussion on educational research Mourad (2001) states, “critical scholarship in education is largely confined to critique about education as a discrete social and cultural institution. The shortcoming is that such work does not really step ‘outside’ of the histories and practices of schooling” (p. 740). Mourad outlines these traditional approaches to scholarship as being limited in several ways. First, a myopic research lens discourages a multi-perspective analysis that positions education at the confluence of interdisciplinary studies. Second, these limited theoretical approaches have placed distinct conceptual and theoretical boundaries on what legitimates a serious and critical investigation into the purposes of education. These frameworks are often limited to the teaching-learning interaction that is centered on prescriptive curriculums, instrumental pedagogical methods, and classroom management techniques. Third, Mourad posits that much of contemporary educational critique has been based on a Marxist theoretical orientation⁵ that takes up capitalism as the foundational reference point for analysis (p. 740). From these vantage points, Mourad posits that the majority of educational theorizing has served to simply replicate itself instead of posing “compelling challenges to mainstream educational theory and practices” (p. 741).

Post perspectives, such as Mourads, seek to provocatively propose “compelling challenges” to re-conceptualize our current educational practices by rendering formal what is implicit across our society. These approaches often explore the unconscious, the unseen, and the strange yet familiar, and the many other structures that are often hidden from view. For example, many post perspectives argue that these discursive structures have become literalized metaphors that are often described simplistically as the “body as machine” and “brain as computer.” These statements become so common and taken for granted that they would appear almost invisible, except for the

faint traces, residues, ruins, or more metaphorically, the ghosts that they have left behind (Doll & Gough, 2002). It is from these residues of the present absent that we should investigate the modern institution of schooling as a purposefully constructed closed system of normalization, power, and control.

The rise of bureaucracies, formal education systems, cities, and even nation states are all modernist projects that emerged as attempts to control vast and expanding networks in the name of efficiency, centralization, and profitability. In response to the rising critiques of the modernist project, one of the most significant theoretical reinventions was critical modernism. Critical modernism arose as a promise to return to a Kantian sense of enlightenment that is based in reason. For example, Habermas argued that this critical reasoning could be found through language, which he described as the "medium of reason" (Cooper & Burrell, 1988, p. 97) that would allow for individuals to transcend the colonization of their life-worlds. Critical modernists, like Habermas with his theory of communicative action, argue that discourses can help us to find a truth or reason that exists out in the world, and that a unified and rational subject can be achieved through communities of dialogue that actively work to reach consensus. Approaches such as Habermas's believe in a grand unifying theory and the presumption of a knowable rational subject that exists.

In contrast, many postmodernist responses to the modernist *and* new critical modernist project arose based upon Derrida's (1980) notion of *différance*. For Derrida, *différance* is an investigation into the gaps, spaces, and in-between moments that occur in discourses. This *différance* seeks to rupture modernist claims to totalized understandings. Metanarratives are viewed as false narratives as all claims to truth ought to be understood as partial, situated, and self-referential experiences. Similarly, Lyotard's view of postmodernism engages a quest to "search for instabilities" (Lyotard, 1984, p. 53).

For Foucault, another extremely influential postmodernist, the body is the site where Derrida's notion of *différance* most notably takes place. In Foucault's eyes, one can only see clearly by making the familiar strange. The modernist project has made us so habituated to routine that we have become normalized into its machinery to such an extent that we have become blinded to our own estrangement and, as such, it becomes necessary for us to see the world anew "as though for the first time" (Cooper & Burrell, 1988, p. 101). For Foucault, Archeology, and later Genealogy, became theoretical constructs that could be used as a way to reveal "ideal essences [and] essential truths" as false narratives that reveal, in their place, "disparity, difference, [and] indeterminacy" (Copper & Burrell, 1988, p. 101). Unlike modernism that searches to find answers to problems, postmodernism and other post perspectives strive to problematize answers and create ruptures in seamless narratives or totalizing Truths.

Foucault places great emphasis on the importance of historicization as a critical attempt to explore the past in order to understand how the present has been actively constructed. Most notably, Foucault uses Genealogy to locate traces of the present in the past, not as an effort to recreate the past, but as a way to understand and interrogate the present. In this Genealogical approach, Foucault explores how institutions create disciplinary structures that regulate and maintain normative discourses or codes of conduct⁶. For example, in schools corporal punishment arose out of the modernist concern for control and governance over students' minds and bodies. A Genealogical approach might show how contemporary schools employ modern disciplinary structures, albeit through much subtler forms, of punishment and correction. These disciplinary devices are often cast in the language of "time outs," "detention," and "expulsion." According to this Foucauldian analysis, it is the hidden disciplinary structures or implicit norms that *most* effectively govern student and teacher behaviour in schools, not formal rules or written codes of conduct.

This disciplinary process also continues to occur within many traditional classrooms, which could be considered panopticons.⁷ In the traditional classroom the teacher is positioned at the center always ready to cast his or her disciplinary gaze.⁸ From these Foucauldian perspectives, discipline in schools becomes a discourse of continual surveillance and control. Students, and in many cases teachers,⁹ are monitored down to the most minute detail. This surveillance can be observed in many contemporary schools that feature dress codes, the alignment of desks in rows, the act of requiring students to raise their hands to speak in class, and even students being required to ask for permission to take bathroom breaks. In these "normal" schools the body can be understood as being located in a constant state of training. This process could more forebodingly be described as a disciplining of the mind and body in the service of a metanarrative that seeks compliant and obedient citizens who do not question authority and who quietly take their assigned place in modernism's machinery.

However, Foucault would also argue that power does not operate on its own. Where there is power there is also resistance. It is this resistance that promotes tensions or disruptions that encourages the spaces or gaps in which Derrida's notion of *différance* can appear. Significantly, resistance is also a central part of discipline. By having resistance, discipline grows stronger as it attempts to prevent unauthorized knowledge from "leaking" out of student bodies. Resistance also provides a clear target for control and power. For example, disobedient or resistant students are often made examples of as a mechanism to police other students into compliant behavior. Under these linear and mechanistic disciplinary approaches it is very seldom that the actual source of a student's behavior is ever analyzed or questioned. We see this simplistic cause-

effect approach still clearly operating in our schools today under the guise of zero-tolerance policies. For modernist institutions to operate efficiently and effectively, any act of disobedience must be quashed. Failure to respond will result in the loss of power, control will become decentralized, and dominant narratives may be brought into question. In essence, without these disciplinary structures the school might become an open and autonomous system with a decentralized network of power and distributed control.

“Keeping the conversation going”— Towards New Possibilities

Throughout history we have witnessed a continued resistance to closed systems approaches in education. These resistances have been evident in attempts at creating decentralized curriculums, student-centered learning, open schools, and notions of constructivism and critical pedagogy. However, these liberatory or student-centered approaches often fail to include an understanding of classrooms as complex (dynamic/open), not merely complicated (linear/closed) educational spaces (Davis, et. al., 2000). To engage a truly open and organic educational system, we ought to view our schools as more than a simple collection of teachers, subjects, and individuals. Moreover, we ought to view our schools as dialogic, diverse, alive, sentient, and nested spaces. Perhaps, a turn to complexity theory may help us to rupture our educational certainty in an effort to begin to take up the postmodern project of seeing our classrooms and curriculum differently. As Merleau-Ponty (1962) suggests, “whether it is [a] question of things or of historical situations, philosophy has no function but to teach us once more to see them clearly” (as cited in Greene, 1998, p. 257).

Similarly, Pinar (1995) and Rorty (1980) both call, for those of us who are concerned with matters of education and philosophy, to “keep the conversation going.” In our conversations lie Doll’s open and closed systems, Derrida’s gaps, Foucault’s ruptures, and Greene’s poetic call to re-imagine educational spaces as places not only as sites of absence and failure, but also as places of immense hope and possibility. Indeed, without this sense of hope and possibility our schools will never evolve from places of control to spaces of community. As Doll (2002) states

We are now in a transition period, one between paradigms. We are entering a period of “post” thought: postmodern, poststructural, post-colonial, postpatriarchal, postindustrial. In this new era, control is seen as being embedded within, not as lying outside or imposed on, situations, as arising naturally and complexly from rather simple interactions. This new sense of control—formed from the web of interactions that is life—is livelier, more varied, and dynamic than what we have known. (p. 54)

Notes

1. Ironically, these lessons and units are predominantly planned in isolation from or outside of the learner. Also, notice the language of business in education. Knowledge is thought to accrue like interest on an investment. In these terms, knowledge is viewed as an investment, not in the individual, but in society's future.
2. Doll (1993) suggests that even when a student scores a mark of 80% on an achievement exam there is still the implicit assumption that they do not know 20% of the material being tested.
3. This idea that knowledge exists outside of the knower ("knowledge is seeing") or that knowledge can be contained does not rest solely with Descartes. Notions of formal logic can be traced back to Aristotle's deductive reasoning and his statement that "ideas are essences", which are contained in the mind. See Lakoff and Johnson (1999), especially chapter 24, for greater detail.
4. From a complexivist understanding, Greene can be viewed as describing the need for bifurcations rather than simple dichotomies.
5. See the works of Giroux (2001) & Giroux & McLaren (1994) for cogent examples.
6. See Foucault (1973, 1977, & 1979).
7. A panopticon is an architectural structure or system that was designed by Jeremy Bentham in 1787 as a tool of surveillance and control. It is most often associated with an image of a guard tower in a prison tower that has one-way reflective windows that allow the guard or guards to see out, but the prisoners can never see in. As a result, the prisoners never know if they are being watch and as such end up "policing" their own behaviour.
8. The invention of the overhead projector might also be considered a disciplinary technology as it allowed the teacher the freedom to move away from the blackboard and correspondingly never have to turn his or her back on the students. The disciplinary gaze could continue on uninterrupted for indeterminate periods of time.
9. For teachers, this disciplinary gaze is often viewed in terms of teacher evaluation, record keeping, and unexpected classroom visits by the school principal. See Haughey (2002) for a detailed analysis of Foucauldian perspectives on educational administration.

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