

Chapter 4

Avoiding Dogmatic Traps in Creativity and Education Through Awareness of Worldviews and Visual Metaphor

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Abstract This chapter explores how misguided school reformers, the policymakers and citizens who believe those reformers, and the school systems and teachers obeying reform mandates often become trapped within a single worldview and think they are being creative. They might be creative to an extent but they are limiting their creativity by confining their thinking within a single root metaphor. The chapter discusses ways in which awareness of the worldviews and the use of visual metaphors can provide an opportunity for broader and deeper creative understanding of educational improvement.

4.1 Introduction

It would be difficult to find many rational adults who wouldn't want to see education improve. Teaching and learning are complex, dynamic processes that have not been perfected and likely won't be for quite some time, at least not at our current level of cognitive evolution. But school improvement and school reform are not necessarily synonymous. While school improvement is a worthy endeavor, most of what passes for school reform in today's neoliberal ideological climate is based on some combination of dogmatism and corrupt profiteering. Some reform advocates have good intentions but only a limited grasp on what learning entails. Others have very narrow, dogmatic conceptions of teaching and learning, analogous to the satirical characterization of nineteenth-century schooling embodied in the Dickensian character Thomas Gradgrind:

Now, what I want is, Facts. Teach these boys and girls nothing but Facts. Facts alone are wanted in life. Plant nothing else, and root out everything else. You can only form the minds of reasoning animals upon Facts: nothing else will ever be of any service to them. This is

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the principle on which I bring up my own children, and this is the principle on which I bring up these children. Stick to Facts, sir! (Dickens, 1854/1981, p. 1)

Still others view public education as just another profit-making opportunity and promote reform as a way to line their own pockets. These various reform initiatives tend to pressure school systems to implement excessive prediction and control through high-stakes testing that narrows the curriculum while imposing barren, robotic teaching methods and quasi-militaristic discipline on teachers and their students. These variations on school reform are explored in an increasing number of analyses (e.g., Beghetto, 2010; Berliner, 2006, 2009, 2011, 2012; Berliner & Glass, 2014; Fabricant & Fine, 2013; Horn & Wilburn, 2013; Kozol, 2005; Lubienski & Lubienski, 2014; Nussbaum, 2010; Ravitch, 2010, 2013; Zhao, 2009, 2014; Zhao & Gearin, 2016).

The unintended results (in many cases) or intended results (in some other cases) include a narrowing of the curriculum and the removal of intrinsic motivation and creative and critical thinking. There are some exceptions. For example, the Common Core standards in the USA make far more room for creativity than is commonly believed (Baer, 2016; Beghetto, Kaufman, & Baer, 2015). Nevertheless, even with a more thoughtful set of externally imposed standards, creativity in the education system suffers when reformers ignore other important influences on instructional effectiveness such as the pernicious effects of socioeconomic inequality (see Cross & Borland, 2013; Fabricant & Fine, 2013; Ravitch, 2010, 2013).

4.2 Metaphor and Dogmatism

Both creativity and school reform can react to the implicit influence of metaphor on the mind. Metaphor has inspired and shaped thought and action in a wide variety of academic disciplines, professional fields, and cultural arenas.

4.2.1 *Research on Metaphor and Cognition*

Dogmatism is the primary enemy of creative, ethical thought and action because it confines human minds to narrowminded, superficial, shortsighted perspectives on complex phenomena (Ambrose & Sternberg, 2012; Ambrose, Sternberg, & Sriraman, 2012). Virtually all of the enormous problems we face in the twenty-first century are caused by dogmatism (Ambrose, 2016b). Interestingly, one of the primary causes of dogmatism, and one of its most effective antidotes, is the use of metaphor.

Serious scholars tend to ignore metaphor, assuming that it is a playful tool used in high school and college English classrooms. Nevertheless, metaphor has been attracting the interest of researchers and theorists in multiple disciplines because

they appreciate the ways in which metaphorical thought exerts powerful, implicit influence on theory, research, and practice. Metaphor frames the tacit understandings that underpin the structure and dynamics of cultures and academic disciplines (see Ambrose, 1996, 2000, 2012, 2014a, 2014b; Amin, 2009; Bowers, 1993; Bowers & Flinders, 1990; Boyd, 1993; Cohen, 2008; Eisenberg, 1992; Gibbs, 2008; Harmon, 1994; Holton, 1996, 1998; Johnson, 2009; Kuhn, 1993; Lakoff, 1993; Lakoff & Johnson, 1980, 1999; Larson, 2014; Osowski, 1989; Overton, 1984; Pepper, 1942; Schön, 1993; Sternberg, 1990).

Just a few examples of the impact of metaphor can facilitate understanding of the ways in which it influences perceptions of complex phenomena such as scientific discovery, environmental policy, and conceptions of intelligence. Metaphorical thought has been an extremely powerful shaping influence on scientific discovery. The prominent physicist/historian of science Gerald Holton (1996) articulated just a few of the metaphors that have inspired and guided scientific inquiry:

...concepts such as the flow of heat or of electricity; of lines of force in the field; of all those metaphors, particularly the military ones in medicine—invasion, attack, defense—and elsewhere in the sciences, e.g., Darwin's Tree of Life, or the tangled bank; and before that, Newton's centers of attraction, his clockwork universe, and on and on.

Larson (2014), an environmental scientist, illustrated additional ways in which metaphorical constructs help scientists develop their understanding of scientific phenomena. However, he also discussed the flip side of metaphorical influence on science—its provision of dogmatic frameworks in social contexts that justify resistance to well-established environmental policies coming out of credible scientific work.

While working on clarifications of the nature of intelligence, Sternberg (1990; Sternberg, Tourangeau, & Nigro, 1993) engaged in large-scale metaphorical analyses of the conceptual frameworks for intelligence theory. He categorized an array of intelligence theories according to their alignment with various metaphorical frameworks including computational, epistemological, biological, geographic, anthropological, sociological, and systems metaphors. More recently, he used the metaphor of a drifting lifeboat to represent the ways in which ethical drift plagues otherwise intelligent individuals and groups within and beyond academia (Sternberg, 2012).

In addition, metaphor can be used as an effective tool for creative leadership because it captures the imagination of audiences and injects the leader's message with power and meaning (Charteris-Black, 2005). For example, Dr. Martin Luther King's "I have a dream" speech that catalyzed the civil rights movement featured frequent invocations of powerful metaphors such as "a lonely island of poverty in the midst of a vast ocean of material prosperity," "tranquilizing drug of gradualism," "rise from the dark and desolate valley of segregation to the sunlit path of racial justice," and "the whirlwinds of revolt will continue to shake the foundations of our nation until the bright day of justice emerges."

If metaphor has such a powerful influence on human thought in a wide variety of academic disciplines and in societal systems it likely exerts strong shaping influences on educational policy and practices. If so, falling prey to entrapment within a

single, limiting metaphor could do considerable damage to teaching and learning, handcuffing talented teachers and stunting the growth of bright young people. But if we become aware of the metaphors that shape our thoughts about education we will gain some power over them and be able to use them as inspiration for educational progress as do the scientists who use metaphorical constructs to generate productive new theories and research agendas.

4.2.2 Metaphorical Worldviews

There are metaphors that shape small-scale decisions and then there are extremely powerful metaphors that make enormous impact on the world. Long ago, philosopher Stephen Pepper (1942) introduced academia to a set of the latter type of metaphor. He described the nature and impact of four root metaphors, which were known initially as world hypotheses and then became worldviews. The four worldviews include mechanism, contextualism, organicism, and formism. Each of the worldviews is based on a root metaphor, and includes a set of beliefs about the ways in which the world works. Here are descriptions of the four worldviews synthesized from Ambrose (1996, 2000, 2012, 2014a, 2014b):

Mechanism The root metaphor of mechanism is the machine. The mechanistic worldview portrays reality as machinelike so its basic tenets include reduction of the whole into discrete component parts, a penchant for precision and appreciation of detail, a search for linear causal effects, and a striving for objectivity in research. Examples of mechanistic influences in the world include reduction of intelligence to an IQ score, the prominence of quantitative-empirical research methodology in the social sciences, and the predictability and precision of scientific management in manufacturing processes.

Contextualism The root metaphor of contextualism is an ongoing event within its context. The contextualist worldview portrays phenomena as unpredictably evolving and contextually shaped so its basic tenets include magnification of the importance of context and the unpredictable emergence of novelty. Examples of contextualist influence in the world include the context sensitivity of complexity theory and the work of cognitive scientists who study the context-embedded mind, highlighting the influence of environment on cognition instead of confining human thought within the cranium.

Organicism The root metaphor of organicism is an organism developing through stages toward a particular end. The organicist worldview portrays phenomena as holistic, comprised of interacting systems within systems so its basic tenets include the notion that the whole transcends its parts and the importance of long-term developmental processes. Examples of organicist influence in the world include developmental theories in psychology that highlight the integration of the affective, physical,

and cognitive dimensions of human experience; the interdisciplinary synthesizing that takes place when scholars establish connections among diverse bodies of knowledge from various fields; and the teambuilding that occurs in organizations that manage to break down bureaucratic barriers.

Formism The root metaphor of formism is ubiquitous similarity such as that portrayed by Plato's ideal forms. The basic tenets of the formist worldview include the search for patterns of similarity in diverse phenomena. Examples of the impact of formism in the world include complexity theorists identifying patterns of similarity in the behavior of complex adaptive systems—for example, the ubiquity of the chaos-order continuum, which shows how complex systems tend to exhibit simple behaviors when they are excessively ordered or excessively chaotic, and highly complex behaviors when they strike a balance at the edge of chaos in the area of dynamic tension between chaos and order.

Much of Pepper's (1942) discussion of the root-metaphorical worldviews emphasized the importance of using more than one worldview conceptual lens to scrutinize and understand complex phenomena. Appropriately, he used an intriguing metaphor to convey the importance of employing multiple metaphorical worldviews when studying something complex:

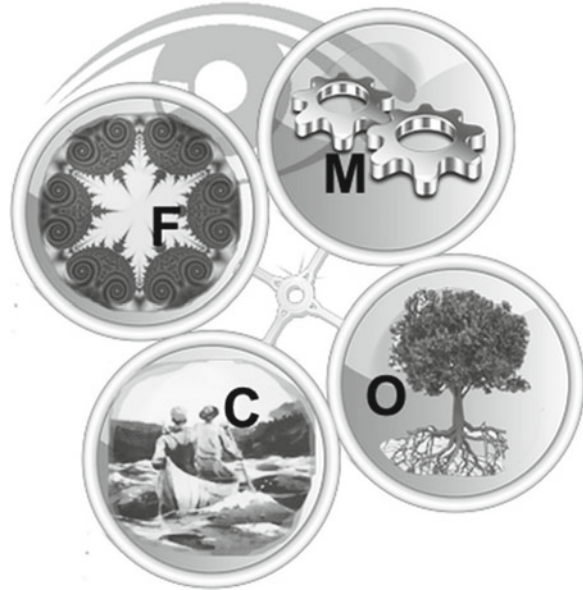
Post-rational eclecticism is simply the recognition of equal or nearly equal adequacy of a number of world theories and a recommendation to not fall into the dogmatism of neglecting any one of them....Four good lights cast fewer shadows than one. (p. 342)

Overton (1984) later made similar points about the need for multiple worldview perspectives on psychological phenomena. Ambrose promoted the use of various worldviews in analyses of creativity theory (1996), the ethical and unethical behavior of the gifted (2000), the dynamics of the chaos-order continuum in complex adaptive systems (2014a), and combatting the dogmatism that plagues theory and research in most academic disciplines (2012). Gillespie (1992) argued that cognitive psychology could benefit from augmenting the important discoveries gleaned from mechanistic approaches with more attention to contextualist conceptual frameworks. Others made the same case for going beyond mechanism in special education (Dombrowski, Ambrose, Clinton, & Kamphaus, 2007; Heshusius, 1989) and gifted education (Cohen & Ambrose, 1993; Cohen, Ambrose, & Powell, 2000).

In yet another example, analyses of root-metaphorical worldview influences in education reveal some creativity-suppressing phenomena in classrooms and schools. Forsyth (2016) showed how the worldview preferences of students influenced the type of content they recall when reading history and science texts. In essence, the preference for a particular worldview conceptual lens in a student's mind magnified the importance of some content while obscuring other content.

These are just a few examples of the ways in which Pepper's four good metaphorical, worldview lights can cast fewer conceptual shadows. Figure 4.1 employs yet another metaphor to reveal the importance of the metaphorical worldviews. Here, each of the four worldviews is portrayed as one of four conceptual lenses rotating around the hub of a wheel that positions one metaphorical lens at a time

Fig. 4.1 The root metaphorical worldviews as conceptual lenses rotating over a human eye



over a human eye. The fact that only one lens at a time can cover the eye signifies the incommensurability of the worldviews. Pepper (1942) argued that the worldviews provide discrete perspectives on the world and tend to be incommensurable, making it extremely difficult if not impossible for the human mind to simultaneously entertain more than one worldview.

In Fig. 4.1 the mechanistic worldview is the upper right-hand lens, which includes mechanical gears signifying the precision, causality, and reduction of mechanism. The organicist worldview lens in the lower-right corner is portrayed by a tree and its roots signifying the holistic integration of subsystems and long-term developmental processes. The contextualist worldview in the lower-left corner is represented by canoeists paddling down a set of rapids signifying the importance of contextual influences (currents, waves, and wind) and the unpredictable emergence of novelty (capsizing or hitting a submerged rock). Finally, the formist worldview in the upper-left corner is portrayed by a fractal image to illustrate the repeating patterns of similarity in diverse phenomena.

If you are not yet convinced of the need for a strange cognitive apparatus such as the rotating worldview lens wheel in Fig. 4.1, the results of extensive analyses reported by the leading economist and complexity theorist Scott Page (2007, 2010) are worth considering. According to Page, cognitively diverse problem-solving teams in a wide variety of organizations have proven to be more effective than homogenous teams when it comes to complex problem solving. A problem-solving team is cognitively diverse if it encompasses diverse theories, philosophical perspectives, and problem-solving heuristics.

If we apply these findings about cognitive diversity to the worldview lens apparatus in Fig. 4.1, a cognitively diverse team would be able to creatively integrate

discoveries from multiple perspectives as it rotates the worldview lenses on the apparatus across its collective eye, perceiving the world through mechanistic, organic, contextualist, and formist conceptual lenses. The philosophical frameworks, favored theories, and research methodologies (i.e., problem-solving heuristics) of each worldview differ markedly from those of the other worldviews.

In contrast, we can conceive of a problem-solving team that is locked into perceiving the world through only one worldview lens as being dogmatic and less effective when it comes to complex, creative problem solving. The effectiveness of this problem-solving team suffers because its entrenchment in a single worldview derives from the rust of dogmatism that locks up the central axle of the device, preventing the rotation of the conceptual lenses past the group's collective eye.

While Page's (2007, 2010) analyses of cognitive diversity apply to groups, we can conceive of the same dynamics applying to individuals. A single problem solver might experience the same creative opportunities offered by the rotating conceptual lenses in Fig. 4.1, and the same problems when the axle of his or her worldview apparatus locks up due to the rust of dogmatism. An individual who comes to understand the benefits deriving from perceiving the world through multiple worldview lenses can inject some creativity inducing cognitive diversity into his or her own mind.

4.3 The Dominance of the Mechanistic Worldview in the Minds of School Reformers

The four worldviews are ethically neutral (Pepper, 1942). The benefits or damage the worldviews can cause are determined by the use to which they are put. In most cases, benefits are derived when multiple worldviews are employed to create more comprehensive understanding of complex, multidimensional issues such as the nature of effective teaching and learning. Also in most cases, damage occurs when thinkers hold fast to a single worldview in efforts to grapple with complexity. Much of the severe damage caused by superficial school reformers appears to arise from their dogmatic, implicit adherence to a single worldview—mechanism.

An emphasis on machinelike structures and processes can be soothing to superficial reformers who lack the cognitive complexity to embrace ambiguity and do real creative work pertaining to the design and function of educational systems. When they reduce the whole education system to select micro-elements of cognition for use in the determination of objectives and accountability measures it does much to clear away clouds of ambiguity and to simplify their task. The mechanistic emphases on precision, detail, and linear causality align with and guide the development and application of the standardized tests required for their accountability systems. Finally, the mechanistic emphasis on objectivity cleanses them of responsibility for whatever damage they do to the educational system because they were simply being objective in their attempts to improve that system.

4.4 Using Worldview Perceptual Lenses to Escape Dogmatism and Generate Insights About School Reform

Because metaphor exerts such powerful implicit influence on our minds we can use it more purposefully to escape at least some forms of dogmatism. Based on the foregoing analyses, one obvious strategy for escaping such entrapment would be applying differing worldview metaphors to a difficult, complex problem or issue. In the case of dogmatic school reform, rotating the contextualist, organicist, and formist root metaphors over our field of vision can help us escape from the dominance of the mechanistic, human-as-machine, root metaphor that dominates the reformers' shortsighted, blinkered minds. For example, while the machine metaphor encourages reformers to force educators to narrow the curriculum so achievement can be measured precisely through psychometrics, the other metaphorical lenses can enable us to see alternative visions of achievement.

4.5 An Alternate View Through the Lens of Contextualism

Positioning the contextualist conceptual lens over our collective eye shown in Fig. 4.1 will focus our attention on aspects of education that the mechanistic root metaphor marginalizes because we will be viewing the education system through the conceptual framework highlighting the "ongoing event within its context generating the unpredictable emergence of novelty." The *ongoing event* of significance here is child and adolescent development and the *contexts* of primary significance are the socioeconomic systems of various nations and regions within nations. Instead of overemphasizing decontextualized knowledge and skills that are easy to capture through precise, mass-applied, standardized testing, the contextualist root metaphor will magnify the importance of context in teaching and learning. As a consequence, policymakers, citizens, and educators will become more aware of the ways in which socioeconomic inequality strongly influences educational achievement.

The "ongoing event within its context" dimension of the contextualist metaphor will encourage us to pay attention to the work of social epidemiologists Wilkinson and Pickett who generate extensive international comparisons of developed nations regarding their levels of inequality and social problems (see Pickett & Wilkinson, 2015a, 2015b; Wilkinson & Pickett, 2009, 2011). The nations with the highest levels of socioeconomic inequality manifest by far the most severe social problems including elevated levels of mental illness, drug and alcohol abuse, violence, incarceration rates, obesity, and teenage births, as well as poor life expectancy, low levels of trust, weak performance on mathematics and literacy educational achievement, and weak social mobility (the chances that a child eventually will surpass her/his parents' socioeconomic level).

The contextualist metaphor can encourage us to pay attention to the ways in which these enormous contextual problems faced by the deprived suppress their educational achievement while severely diminishing or precluding the discovery of aspirations and the discovery and development of talents related to those aspirations (see Ambrose, 2013; Biddle, 2014; Cookson, 2013; Cross & Borland, 2013; Duncan & Murnane, 2011; Fabricant & Fine, 2013; Lipman, 2004; Sacks, 2007). With the benefit of insights from the contextualist worldview, shortsighted reformers will find it more difficult to make excuses for their own lack of intellectual scope such as their ignorance of context in the “no excuses” admonitions they impose on teachers of impoverished children (see Sondel, 2015). American school reformers’ ignorance of context is especially pronounced because the United States is the most unequal of the developed nations so it is the nation most severely plagued by the oppressive societal problems that accompany extreme inequality (Wilkinson & Pickett, 2009).

In addition, the “unpredictable emergence of novelty” emphasized by the contextualist worldview will magnify the importance of spontaneous, emergent creativity and learning. For example, it will make policymakers, citizens, and educators more aware that students are complex, adaptive systems navigating between excessive order and excessive chaos in their classroom settings and socioeconomic contexts and occasionally finding the creativity generating dynamic tension between chaos and order (see Ambrose, Sriraman, & Pierce, 2014).

4.6 Perceiving Additional Dimensions of Reform Through the Organicist Lens

While the hyper-mechanistic reformers tend to ignore the importance of exceptionally powerful contextual pressures on teaching and learning, they also ignore interconnected dimensions of the learner that extend beyond easily measurable cognitive processes. By flipping the organicist conceptual lens in front of our field of view we can perceive the intricate integration of subsystems within individuals and groups, the long-term sense of purpose that drives important creative achievement, and the senses of altruism and ethics that tie all of us together in a complex, turbulent world. Arguably, child and adolescent development that attends to these dimensions of human potential is at least as important as the learning of measurable academic content.

Cognitive processing of academic content is an important aspect of a good education but that processing can be much more dynamic and successful if it is augmented with other forms of development. Interestingly, some of the nations we most often put on a pedestal for their high levels of measurable academic achievement don’t always employ the test-and-punish mentality of our superficial reformers. Finland, for example, has been very successful in international comparisons of student achievement but the educational system of that nation places strong emphases

on the social and affective domains, independent thinking, the development of a sense of purpose, ethical sensitivity, altruism, and an egalitarian mindset (Tirri, 2011, 2016). In essence, this international exemplar of lofty academic achievement emphasizes the whole child, not just some easily measured decontextualized fragments of cognition.

Similarly, the Roeper school in Bloomfield Hills, Michigan values subject area content learning but does not prioritize it. Instead, the school emphasizes intrapersonal discovery of aspirations and talents, the development of a long-term sense of purpose, and ethical awareness (Ambrose, Sriraman, & Cross, 2013). Much of the reason for the school's remarkable success with this whole-child approach is the emphasis on bottom-up, democratic decision-making. Instead of imposing top-down, test-based sanctions to motivate teachers and students to work harder, the school enables students and teachers to make important decisions about their own development and the interconnected workings of the school. Of course, they are able to take this approach because they don't work within the public education system, which is encumbered with the onerous, imprudent demands of our current crop of misguided reformers.

In essence, when the organicist worldview lens cycles into our range of vision it clarifies the integration of subsystems within the whole child thereby expanding our sense of educational possibilities. Children immersed in an educational system that pays serious attention to the whole child can find opportunities to integrate their growing knowledge bases with the motivational fuel of positive affect and ethical awareness. This integration can initiate long-term developmental processes along the lines of those experienced by the big-C creators studied by Howard Gruber (1989, 1993, 1999). Such development involves a powerful and growing sense of purpose and the exploration and mastery of multiple, intertwining projects throughout the lifetime. Obviously, this kind of development represents a worthy educational pursuit if school reformers can escape their pernicious dogmatism long enough to appreciate it.

4.7 Understanding Troubling Similarities Through the Formist Lens

The smug, dogmatic certainty of many reformers largely derives from their unshakable belief in the hyper-mechanistic achievement measures they use for accountability purposes. The context-ignoring, whole-child-dismissing reductive precision they achieve by confining their vision to the mechanistic conceptual lens enables them to assume that their portrayal of educational reality tells the entire story about educational purpose and achievement. But when we flip the formist world view lens over our field of vision some helpful insights from far-flung disciplines come into play. These insights enable us to perceive the limitations of the reformers' confinement to the single mechanistic worldview lens because it makes available constructs

such as market fundamentalism, the flight from reality in the human sciences, sterile certainty, and a troubling scientific illusion.

As with the repeating fractal patterns revealed by the transdisciplinary work of complexity theorists, the formist worldview allows us to cross disciplinary borders to discover patterns of similarity in the work of prominent political scientists, economists, and mathematicians, among others. First, the Nobel laureate economist Joseph Stiglitz (2010) argued that orthodox economics has been dominated for too long by *market fundamentalists* who believe that laissez-faire market dynamics unencumbered by government regulation will lead to the best possible economic outcomes. While illustrating the flaws in that logic, Stiglitz explained that he calls dogmatic economists market fundamentalists because their beliefs are resistant to new findings to the point where their thinking approximates the theological rigidity of radical religious fundamentalists. Positioning our similarity seeking formist perceptual lens over our field of vision enables us to perceive a similar phenomenon when it comes to the fundamentalist rigidity of school reformers who contend that unencumbered free-market dynamics such as school privatization can make education much more effective than it is under government control.

Three other prominent scholars provide additional formist patterns of similarity that can help us understand the limitations of holding firmly to the single mechanistic perspective on education. All three of these investigators call into question the extent to which academic research aligns with the reductive precision emphasized by the mechanistic worldview.

First, the well-known political scientist Ian Shapiro (2005) analyzed the conceptual frameworks dominating the law and economics paradigm in the social sciences and the rational choice model at its core. The notion that a *rational actor* makes clearly rational decisions based on comprehensive datasets for primarily selfish reasons doesn't align well with human nature, which includes considerable irrationality and healthy doses of unselfish, altruistic behavior. But the rational choice model works well as a framework for mechanistic model building and quantitative-empirical research; consequently, it retains a central place in the social sciences even though Shapiro calls the mismatch between the model and actual human nature the *flight from reality in the human sciences*.

Second, in his groundbreaking analysis of twenty-first-century capitalism, the leading economist Thomas Piketty (2014) argued that economics isn't nearly as scientifically precise as mainstream economists believe:

I dislike the expression 'economic science,' which strikes me as terribly arrogant because it suggests that economics has attained a higher scientific status than the other social sciences....For far too long economists have sought to define themselves in terms of their supposedly scientific methods. In fact, those methods rely on an immoderate use of mathematical models, which are frequently no more than an excuse for occupying the terrain and masking the vacuity of the content. (p. 573–575)

Piketty elaborated on this problem calling it a *scientific illusion*. He recommended that economists pay more attention to social, political, and cultural influences instead of relying excessively on reduction of the individual human being to a rational actor.

Third, the leading mathematician William Byers (2007, 2011) carried out extensive analyses of his own discipline and the natural sciences, arguing that theory and research in these fields, which are normally considered to be at the apex of the disciplinary hierarchy (see Simonton, 2004, 2009, 2012) are not nearly as logical, precise, and certain as many researchers and theorists assume. In actuality, there is considerable imprecision and uncertainty in the conceptual frameworks and central constructs of these fields and the scholars' craving of order makes them fall into a form of dogmatism that Byers calls *sterile certainty*.

By looking through the formist conceptual lens and perceiving the flight from reality in the human sciences, the scientific illusion of economics, and the sterile certainty that sometimes arises in mathematics and the natural sciences we are able to perceive parallels with the dogmatic, hyper-mechanistic conceptual frameworks that underpin school reform. If the social sciences and the natural sciences are prone to these forms of dogmatism we can safely assume that the much less rigorous conceptual underpinnings of school reformers' accountability systems likely are prone to severely damaging flights from reality, scientific illusion, and sterile certainty.

4.8 Visual Metaphor as an Unusual Dogmatism-Busting Tool

As is evident from exploration of education through the four worldview lenses in the previous subsections, school improvement is an immensely complex issue that goes far beyond the simplistic test-and-punish portrayals offered by most school reformers. Consequently, adequate understandings of creative, twenty-first-century teaching and learning require simplifications that don't entail too much loss of meaning. Convincing policymakers and citizens of the need for more comprehensive understanding of educational achievement also requires some creative scaffolding.

Complex but understandable graphic organizers can be helpful in this regard. Visual metaphors are particularly interesting graphic organizers. Depictions of the visual-metaphorical thought process come from the work of developmental psychologist Howard Gruber (1974, 1978) who carried out retrospective case studies on highly creative people. Gruber found that some prominent creators, notably Charles Darwin, constructed metaphorical images to clarify understandings of enormous amounts of data and difficult material. These *images of wide scope* synthesized a great deal of complex information in condensed form providing a basis for understanding the known and for launching more insightful searches into the unknown. Later, Cohen (1994) turned this process into a teaching strategy in which learners would *mode switch*, translating academic content from the way it originally was presented (e.g. text) into another form such as a visual-metaphorical sketch or painting.

The symbolism in the new piece of conceptual art would capture, simplify, and convey the content embedded in the verbal-symbolic work that was translated by the learner. An effective visual metaphor can synthesize a great deal of content and

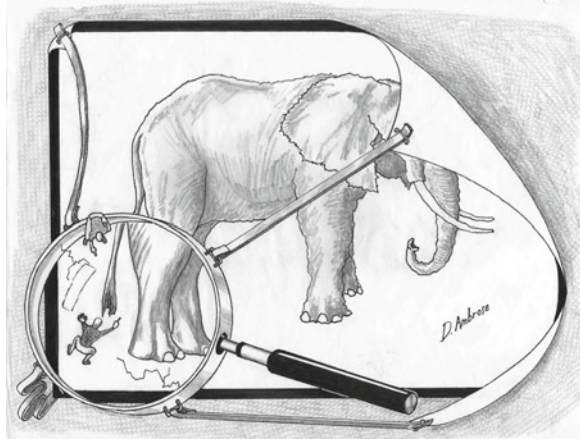
make it memorable for the learner, and possibly to her or his audience. The apparatus with the four worldview conceptual lenses in Fig. 4.1 is an example of a visual metaphor, in this case synthesizing a large amount of scholarship on the root-metaphorical worldviews by turning it into visual form.

I have created other two-dimensional and three-dimensional models to synthesize theory and research from multiple academic disciplines in order to capture the essence of complex phenomena while also making the transdisciplinary syntheses accessible to readers. For example, a two-dimensional model synthesizes scholarship from economics, history, political science, sociology, ethical philosophy, and gifted education to portray the dynamics of democratic growth and erosion in various societies (see Ambrose, 2005; Yamin & Ambrose, 2012). The model includes a double-ended ideological arrow signifying the dynamic tension between the right-wing tenets of individualism, economic freedom, and limited government and the left-wing tenets of community, distributive justice, and government regulation. A circle below the arrow conveys the dynamics of democratic growth in societies when widespread epistemic power (voter awareness) and prudent regulation are in place, as well as the erosion of democracy toward totalitarianism when either right-wing or left-wing ideological extremism takes hold. Implications of these socioeconomic phenomena are drawn for teachers and learners. The simplicity of the model conveys understanding of otherwise complex, obscure sociopolitical phenomena.

There is considerable metaphorical content in this model of democratic growth and erosion; consequently, it qualifies as a visual metaphor. Leading scholars of metaphor, Lakoff and Johnson (1980, 1999) described how spatial orientation is prominent in metaphorical thinking, especially the metaphorical notions that up is good and down is bad. The visual metaphor of democratic dynamics portrays growth of democracies as a vertical arrow going up through the middle of the model while democratic erosion is signified by movement down a slippery slope on either the left-wing or right-wing extremist edges of the model.

Another example of an interdisciplinary synthesizing visual metaphor portrays theory and research findings from ethical philosophy, history, political science, sociology, economics, and education in the form of a gigantic glass cube several thousand miles on a side, half filled with earthen material that has been shifted around to create mountains, valleys, and flat plains (see Ambrose, 2009). In the metaphor, the mass of humanity spreads out across the surface of the landscape inside the glass cube with those who have made enormous, positive moral impact on the world climbing up the peaks of benevolence and those who have done enormous evil descending into the valleys of malevolence. Billions of other individuals stand in or near the midrange neutral territory on the landscape because they have exerted little positive or negative moral impact on the world. The simple metaphorical model captures and conveys the essence of a large number of complex constructs including notions of universalist and particularist morality, relational altruism, quasi-altruism, and the work of the eminent philosopher Hannah Arendt, among many others. Without the visual metaphorical rendering, the interdisciplinary synthesis would require hundreds of pages of dense academic jargon that would be inaccessible to all but the most obsessive interdisciplinary scholars.

Fig. 4.2 Pachydermic Proof: A visual metaphor capturing and conveying the essence of paradigm shifts and dogmatism in academic disciplines—or the dogmatism of school reform initiatives (From Ambrose, 2016a)



This chapter concludes with one more visual metaphor, shown in Fig. 4.2. This image, inspired by the old Sufi parable of the blind men and the elephant, metaphorically symbolizes an academic discipline as a giant magnifying glass hovering over a photograph of an elephant, which represents all of the phenomena within the scope of the discipline.

Tiny researchers and theorists crawl around on the surface of the glass gaining a magnified, crystal-clear view of a small portion of the elephant so they assume that they are seeing the entire elephant. Meanwhile, the steel frame of the magnifying glass represents the epistemological and methodological conventions of the discipline. The rim pressures the scholars to conform to the favored thought paradigm of the day and they are strongly discouraged from looking beyond the rim where they might catch a glimpse of more of the elephant. Rubber bands of dogmatism attach the rim of the magnifying glass to the corners of the photograph of the elephant. Wherever the magnifying glass is positioned there likely will be some distortion or covering of the picture because at least one rubber band of dogmatism will pull up a corner of the picture and hide a portion of the elephant. So even when there is a paradigm shift, represented in this visual metaphor as a movement of the magnifying glass to make it hover over a different portion of the elephant, the scholars will be unable to perceive the entire picture of the elephant.

The only way to capture a comprehensive vision of the photograph is for the scholars to (a) realize they are limiting their vision by confining themselves to a narrow set of epistemological and methodological conventions, (b) cut the rubber bands of dogmatism, (c) set aside the magnifying glass, and (d) elevate themselves high above the picture to gain a panoramic vision that is detail-poor but rich in scope. After doing this they can return to their detail-focused, magnified view of a portion of the elephant, enriched by their newfound awareness of the entire picture.

While this visual metaphor was designed to capture and convey the essence of dogmatism in academic disciplines it also can be interpreted as a critique of the school reform agenda. For example, the entire picture of the elephant now becomes all of the possible dimensions of student growth including academic knowledge and skills, social and emotional development, creative and critical thinking, physical development, ethical awareness, and more. The sturdy, magnified rear leg represents the limited range of knowledge and skill captured by the reformers' primarily mechanistic accountability systems. The small individuals crawling around on the lens are the reformers. They peer through the glass gaining a magnified vision of what they think is the essence of learning and remain oblivious to the rest of the elephant that stretches beyond the rim of the glass. Their rubber bands of dogmatism are particularly strong and hide considerable portions of the big picture, thus making broader conceptions of learning far less accessible to policymakers, citizens, educational professionals, and students. Their narrow, intense focus on what's measurable through the lens of their reform magnifying glass makes it far less likely that students will enjoy school systems that are aligned with the complexity of the twenty-first century socioeconomic and cultural environment.

Much more detail can be added to this visual metaphor. Individuals and groups of educators, creativity researchers, and policymakers can play with it to make it capture more of the ideas that they think are important for the creation of a stronger educational system. For example, what might the cracks in the lens of the magnifying glass signify?

4.9 Concluding Thoughts

The root metaphorical worldviews implicitly operate on the mind so it is difficult to appreciate the ways in which they trap of us in dogmatic thought frameworks. Meanwhile, school reform initiatives are operated by, or at least heavily funded by, enormously affluent individuals and groups. Some of these leaders and funders are talented and accomplished in particular domains but have little knowledge of student learning or pedagogy. Other affluent, powerful leaders and funders simply inherited their privilege and have rather ordinary minds incapable of understanding the complexity of creative educational systems. Still others are predatory profiteers with little concern for the well-being of the millions of children who rely on thoughtful educational improvement. Making the worldviews more visible might be one way to reveal the limitations of current reform initiatives. In addition, using the rather unusual creative process of visual-metaphorical rendering to capture and simplify complex educational issues could help policymakers and the general public become more aware of the structure and dynamics of creative educational systems.

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