The Relevance of Thomas Kuhn to Teaching and Intellectualism

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Introduction

When Thomas Kuhn first introduced the terms "paradigm" and "paradigm shifts" in his 1962 book, *The Structure of Scientific Revolutions*, the intent was to address the changing nature of scientific knowledge and how it was conceived. However, as Joe Kincheloe shares in his 1993 book, *Toward a Critical Politics of Teacher Thinking*, these terms can apply to a broad spectrum of contexts, particularly education. My intrigue with Kuhn's terms is specifically relevant to epistemologies and ontologies, and their potential implications for education.

What is the role of education, and what is our teaching role? There are those who advocate educators being transformative intellectuals where teaching becomes an emancipatory process for learners to become knowledgeable and vocal citizens within a hopeful democratic society (Freire 1985; Giroux 1988; Kincheloe 1999, 2000). Unfortunately, as Henry Giroux (1988) and Joe Kincheloe (1999) note, conditions must be established to enable learners to become such citizens. Likewise, educational settings require conditions that allow educators to become transformative intellectuals without fear of reprisals, retribution, ostracization, and censure. Are we, as educators, allowed to be transformative intellectuals? Are we genuinely encouraged to advocate transformative intellectualism among our students?

I am a little pessimistic about this, particularly with regard to my experiences as an educator for nearly two decades in the United States. As unusual as this seems, perhaps the late comedian Steven Allen said it best.

> Do schools teach us how to think? They do not. They teach us *what* to think. But it's odd that at a time when "consciousness raising" is at least relatively popular, thinking itself has nevertheless enlisted the support of relatively few defenders, even though it is one of the chief means of raising one's consciousness. (Allen 1998, 41)

Epistemologies and Ontologies

Perhaps an examination of these terms is necessary. Many dictionaries define epistemology in terms of a philosophy of knowledge. I take a slightly different perspective, primarily due to the word "ontology." While some dictionaries may define ontology in terms of a philosophy or belief of being, or reality, I take a rather postmodern view and define ontology as a philosophy of knowledge.

Why? Both Reinders Duit and David Treagust (1998), and Stella Vosniadou and William Brewer (1992) describe "ontological belief" in terms of categorizing the world; I interpret this to be a philosophical recognition of knowledge, as in what constitutes knowledge. In this current era of education and accountability, we continuously deal with the issue of content knowledge recognized only as testable knowledge (Shiland 1998). If knowledge is only recognized according to assessment, of what ultimate value is it? Is learning merely for the sake of assessment and short-term competency? (Kincheloe 1991, 1993; Pushkin 1998a, 1998b, 1998c, 2001c, 2001d)

What constitutes knowledge? The words of textbooks? Are other perspectives trustworthy (e.g., indigenous knowledge)? To what degree are multiple views essentially equivalent? Recent scholarly writing is dedicated to this debate (Aikenhead and Jegede 1999; Akatugba and Wallace 1999; Allen and Crawley 1998; Atwater 1996; Tobin, McRobbie, and Anderson 1997; Waldrip and Taylor 1999). My point is, what do we acknowledge and respect, or dismiss, as knowledge, and what criteria do we use to make such distinctions? Is one person's knowledge another's irrelevant nonsense? Is only one view "The Truth," and all others inferior fallacy, or is "truth" contextual? (Pushkin 2001a)

Is there a worldview of information, subcategorized as knowledge and triviality? In essence, what do we deem "reality" and what do we deem, for lack of a better word, "fantasy"? Or is knowledge contextual? (Kincheloe 1991, 1999; Kincheloe, Steinberg, and Tippins 1992) Is reality contextual? This is the significance of ontological beliefs and/or views: they are individual and contextual; no one view is worthier than another at mere face value. This is not to say one view cannot be correct, but certain conditions need to be met; this is no different from how we view scientific laws and boundary conditions. Within a discipline of knowledge, there can be a correct view, or a "truth." However, in philosophical terms, the correctness of a view is personalized and contextualized.

If an ontological view represents how one recognizes knowledge, what does an epistemological view represent? Because one's ontology addresses a question of what knowledge is, it stands to reason an epistemology relates to a question of how knowledge exists. In other words, how is knowledge defined? How is it acquired? How is it evaluated? How is it shared?

Ultimately, we might be able to consider ontological views the philosophical underpinning to curricula, theory, and policy, and epistemological views the philosophical underpinning to pedagogy, practice, and *modus operandi.* Not only may both views go hand-in-hand; one may support or justify the other (Elliott 1998; Goodson 1993; Scheurich 1997). This can manifest in various ways: course enrollments, book choices, modes of assessment, expectations of faculty, decisions to reward, and decisions to punish.

From a curricular perspective, we need to understand and appreciate how knowledge is constructed, not in terms of learning theories, but in terms of arbiters of knowledge exchange. In other words, who decides on the curriculum content, the mode of assessment, and the textbooks? Who ultimately possesses the power and control over knowledge in schools, at any educational level? For example, how much voice did science teachers in Kansas have regarding the debate to teach evolution? (Pushkin 2001c, 2001d) From a pedagogical perspective, we need to understand and appreciate how knowledge is acquired, shared, and assessed, not in terms of pedagogical theories, but in terms of power relationships, personal meaning, and knowledge regulation. Is knowledge holistic or disconnected? Is learning viewed holistically or in terms of the whole never being greater than the sum of its parts? (Kincheloe 1999)

Consider Vygotsky's concept of mediation, but for all learning contexts (children and adults). The authority figure in a classroom, even a university lecture hall, has enormous influence on learners. A professor can be a nurturing facilitator or a hegemonic gatekeeper, stifling students' desire to think and learn (Pushkin 2001a, 2001b). Ultimately, we ask whether students learn to be passive, deskilled, superficial thinkers, or conscious, empowered, deep, critical thinkers (Kincheloe 1999). Do students get their "money's worth" or do they feel unfulfilled at the end of learning experiences? (Pushkin 1999, 2001b) Are students encouraged

to look beyond "factoids" (Kincheloe 1991) and textbook glossaries for deeper and broader meanings? Are they encouraged to challenge themselves beyond the boundaries of their course syllabi?

But more importantly, are students engaged in active discussion or debate about the validity of knowledge, or do they merely record it as the gospel, dictated by authorities? What message does this send to aspiring educators, who may not have the sophistication to discriminate between positive and negative teaching/learning experiences? What practices will they unconsciously perpetuate? What new paths will they blaze, and how will they have the capacity to blaze such paths? If new generations come from a culture unfamiliar with transformative intellectualism, how will they someday help create this new culture? Where is their model? In short, as faculty members of the university community, it's us!

Relevance

Kuhn's influence on my epistemology reflects more of what Jerome Bruner shares in his 1996 book *The Culture of Education*. Bruner notes science's ability to resist "scientific revolutions." Scientific knowledge was supposed to be fairly stable, tried, and true. I wish to take this thought further, for there is knowledge, and then there is the process of knowledge. By scientific knowledge being resistant to revolutions, one could infer that science itself becomes what the nineteenth-century philosopher Herbert Spencer considered mostly inert—a collection of dead facts (DeBoer 1991; Hurd 1998). Course content could be considered "stuff" teachers disseminate in classical "chalk-and-talk" lecture mode. Facts are facts, and constants are numbers to substitute into algorithms. No one is to question the origins, as such information is considered sacred and valid through the generations. Perhaps this is a bit extreme. Students of all generations need to have the opportunity to explore, question, and critique scientific knowledge as it has evolved and continues to evolve. Those who do not question knowledge essentially become "cognitive capitulators" (Pushkin 2001a, 2001b).

However, we should appreciate a subtle distinction within this discussion in terms of knowledge versus process of knowledge. Again, we return to our fundamental concepts of epistemologies and ontologies. In terms of science, several aspects of knowledge have evolved greatly due to significant paradigm shifts. Copernicus helped us to view the solar system as heliocentric. Priestly, Scheele, and Lavosier helped us understand the existence and significance of oxygen. Einstein helped us to view motion in an entirely new context. By questioning the sense and validity of current knowledge, these men and others brought us further along the continuum of understanding the works of nature and our universe. If such knowledge went unquestioned, who knows what knowledge we would possess as we begin a new millennium?

Granted, many scientific principles have stood the test of time and remained "stable." Sometimes, principles were erroneously accepted and sustained, based on *a priori* limited assumptions. Who knew atoms contained neutrons, until subsequent experimental data suggested flaws in theoretical models? Then again, on a more contemporary level, who knew vote count projection models were fundamentally flawed until last year's U.S. presidential election? Until we're confronted with a genuine reason to question the general validity of a principle, we're inclined to accept and advocate it.

Sometimes, principles indeed remain "stable" for the "right" reasons; sometimes they remain "stable" for the "wrong" reasons. The same could be said for changing principles. In other words, principles can withstand the test of challenges or not be challenged at all. Principles can also change due to asking better questions and posing better challenges, or they can change for the sake of change.

Implications

The process of thought and questioning (e.g., metacognition) doesn't have to remain "stable." Taking things to an extreme, this stability can be viewed as an intellectual inertia of sorts. Regardless of knowledge, or its context, the process of knowledge (under the constraints of intellectual inertia) remains constant, as if thinking doesn't evolve. History expands, language evolves, and science innovates, but this is all supposedly independent of the human mind. How troubling, and yet this is the essential foundation to transformative intellectualism. How can things take place independent of the human mind? How can the world grow, yet leave the mind unaffected? Kuhn's assertion that scientific knowledge was resistant to paradigmatic shifts and revolutions sadly lends truth to common pedagogical and curricular practices we continue to cringe at. This resistance is more than resistance; it is a hegemonic inertia. As our world and knowledge continue to grow, how is it that education still retains contradictory perspectives towards teaching and learning? Knowledge evolves, but the process of knowledge doesn't? It simply doesn't make sense. This would resemble Albert Einstein formulating his theory of general relativity assuming Newtonian mechanics was universally valid.

There seems to be a great disconnection within education. Apparently, knowledge evolves in contrast to an inertial process of knowledge. On the other hand, when education is viewed to evolve, we forget to contextualize the knowledge. In my mind, Kuhn strikes a personal cord, since we are observing a slow and painful paradigm shift within education. This paradigm shift, however, is quite complex, as several individual "sub-shifts" exist: issues of content coverage, modes of assessment, teacher preparation, and academic accountability. Somehow, the critical issue seems to be our collective inability to resolve what to do (e.g., pedagogy and curricula) with knowledge as it has evolved.

Consequently, the most crucial paradigm shift I see within education involves a collective dysfunction. Teachers and students alike cling to their epistemological and ontological sacred cows, where the same decontextualized content is presented for passive consumption. Learning activities and assessment seek to confirm an assumed conclusion, emphasizing short-term reiteration of the arbitrary. That's not to say our course content is wrong, but how we package it might be. In many cases, the answers of yesterday remain the answers of today. People, dates, and places don't necessarily change, nor do chemical formulas or mathematical algorithms. But how do we come to understand and appreciate those people, dates, and places? How do we come to understand and appreciate those chemical formulas and mathematical algorithms? As I've discussed, it's more than simply concerning ourselves with what knowledge needs to be learned, but how it should be learned.

As we strive to shift away from this dysfunction, somehow it remains entrenched. The paradigm of stasis is so strong it resists and censors those seeking to change the paradigm. Both Michael Fullan (1993) and Peter Senge (1990) refer to education as a conservative system. By conservative, they did not necessarily mean political leanings, but perhaps meant it analogous to scientific laws of conservation (e.g., energy, mass, electric charge). Is it possible that, no matter how many reforms or innovations we enact, education will somehow return to its original form? Fullan warns us of the perils of reform starting at the periphery, and for good reason. If the core of a system remains intact, so does the power hierarchy; hence, reform fails, for it's incomplete. Essentially, it's change for change's sake, but there's really no fundamental change at all.

What seems to be missing? For a starting point, perhaps the key ingredient is consciousness (Allen 1998; Freire 1973). Somehow education lacks enough of this. We struggle to evolve but are fundamentally unclear as to what we're evolving from or towards. Do we genuinely have our own philosophical baselines? I'm perpetually trying to resolve and establish mine after many years of being a student and educator.

Transformative intellectuals need to create a steady barrage of opportunities for people to dare look themselves in a mirror and challenge their personal truths, realities, and sense of safety and comfort. But people

are perhaps too terrified to look and deconstruct, fearing the unknown within themselves. Introspection and growth may be too much to ask of those who know no differently. It is too painful to face challenges already presumed conquered, for this requires too much time and effort, as well as acknowledging our inherent flaws and a need to demand better of ourselves. Infallibility is a delusion, yet we reward the delusion to placate ourselves. For safety's sake and self-preservation, we suppress the challenge, shroud the mirror, and maintain a "cocoon of familiarity" (Pushkin 2001b). And yet, why should we assume pretty butterflies always come from the cocoon?

Yes, Kuhn's ideas have affected me, but in a troubling way. As I have become more conscious of my personal epistemological and ontological evolution, I observe too many who cannot and will not evolve. And this continues in our present-day education settings. These ideas remind me not to be a pedagogical hypocrite, to practice what I preach, and to emphasize the long-term growth and maturation of my students, both cognitively and affectively. These ideas remind me to be sensitive to the learning process and guide my students through it, but intellectually. Teaching and intellectualism mean more than knowledge itself; the process is perhaps ultimately more important than the product.

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