Organization Model of a Constructivist Learning Community: A Teilhardian Metaphor for Educators

STEPHEN R. WHITE
Appalachian State University

ABSTRACT: Within educational thought there are interests to advance constructivist learning and to conceptualize educational organizations as learning communities. At the convergence of these notions is the organizational foundation for a constructivist learning community model.

The objective of this article is to provide a metaphor of a constructivist learning community organization. The metaphor is grounded on French scientist and philosopher Pierre Teilhard de Chardin's (1881-1955) theory of evolution. The study asserts that Teilhardian thought is beneficial for conceptualizing a constructivist learning community. Uniquely, extracted Teilhardian concepts are congruent with many notions of constructivism and learning community organization. Thus Teilhardianism is an intellectually fertile platform for the development of a constructivist learning community metaphor.

RESUMÉ: Dans la recherche sur l'éducation, il y des intérêts certains à avancer cette étude évolutive et à imaginer des centres éducatifs comme des collèges polyvalents pour tous. La solution pour organiser ce collège polyvalent pour tous, se trouve au milieu de ces notions.

L'objectif de cet article est de montrer la structure d'un collège polyvalent pour tous. La structure est basée sur la théorie de l'évolution du scientifique et philosophe français Pierre Teilhard de Chardin (1881-1955). Cette étude affirme que la pensée des Teilhardiens est bénéfique pour imaginer le concept d'un collège polyvalent pour tous. Les concepts Teilhardiens sont parmi ceux qui sont compatibles avec de nombreuses autres notions sur l'organisation de collège polyvalent pour tous. Ainsi, le Teilhardanisme est intellectuellement une plate-forme positive pour développer un concept sur le collège polyvalent pour tous.

The Constructivist Learning Community

Constructivist's literature is abundantly expansive. Yet, two specific theoretical categorizations exist: cognitive constructivism and social constructivism. Cognitive constructivists explore an individual's learning processes while cognitively they attempt to understand

Journal of Educational Thought
Vol. 36, No. 2, 2002, 111-128.

reality (Bertrand, 1996; Woolfolk, 1998). Social constructivists explore the relationships that exist between individuals as they share thoughts, negotiate meaning, and bring their knowledge base to present learning relationships with others (Bertrand, 1996; Wink & Putney, 2002).

Three suppositions are inherent in both constructivist musings: (a) cognitive development occurs in evolutionary stages, (b) knowledge construction is a dialectical process, and (c) the quality of knowledge construction is influenced by the social context of the learning process (Bertrand, 1996; Cooper & Boyd, 1999; Gray, 1999; Jalongo, 1993; Starrat, 1996; Wink & Putney, 2002).

The first two suppositions rest upon the belief that learning is a creative process and that knowledge acquisition is transformational. Learners actively integrate their existing knowledge base with new information resulting in higher levels of cognition. Thus learning is progressive as the mind evolves toward increasing levels of cognitive complexity and higher orders of knowledge construction (Bertrand, 1996; Brooks, 1990; Piaget, 1970; Tobin & Dawson, 1992; Twomey, 1989; Woolfolk, 1998).

The third supposition is that cognitive development is accelerated through social interactions resulting in greater depth of knowledge construction. The social context of learning is intrinsically linked to cognitive development (Bertrand, 1996; Piaget, 1970; Thayer-Bacon and Bacon, 1998; Vygotsky, 1978; Wink & Putney, 2002). Thus some educationists argue that the organization of a learning community is the most fruitful milieu for cognitive development and knowledge construction (Boyer, 1995; Joyce & Weil, 1996; Sapiro & Levin, 1999; Sergiovanni, 1993, 1999).

Educationist Lev S. Vygotsky (1896-1934) was an early thinker of social constructivism and learning community organization. He asserts that each learner's cognitive development takes place from within the learner but, also, from without as a collective social endeavor (Wink & Putney, 2002; Vygotsky, 1978). The Vygotskyian thesis is that learning is a social process, which he termed *intersubjectivity*. Defined, intersubjectivity is the creative process of constructing shared definitions, negotiation of meanings, from social interactions. The learning community provides the social context for creating cognitive strategies collectively, reflectively solving problems, and to construct common knowledge (Crook, 1994; Edwards & Mercer, 1987; Putney, 1996; Kozulin, 1990; Tharp and Gallimore, 1988; Wertch, 1985; Wink & Putney, 2002).

Educationist LeAnn Putney (1996) further elaborates on the Vygotskyian sociological notion of communal learning when she writes. "Intersubjectivity, the sharing of a social world through the process of negotiating meaning, allows us to see what the participants jointly construct in their talk and actions, and thus, how practices [within the community] associated with being literate...come into being (pp. 129-130). Social collectivity does not undermine learner's diversity, but empowers the learner by advancing their cognition, intellectuality and knowledge foundation (Vygotsky, 1978, Wertch, 1985; Wink & Putney, 2002).

At the convergence between cognitive and social constructivism emerges the theoretical foundation for an organization model. This organization is termed a *constructivist learning community*. Broadly defined, the constructivist learning community is an organization system, an interconnected social and cognitive network of learners, evolving toward higher levels of cognitive complexity and knowledge construction (Cooper & Boyd, 1999; Gray, 1999; Moffet, 1994; Thayer-Bacon & Bacon, 1998; Twomey, 1989; Sapiro & Levin, 1999; Wink & Putney, 2002).

Developing an Organization Metaphor

Organization theorist Gareth Morgan (1997) states that a metaphor is the symbolic interplay between objective and subjective realities. That is, "we see [organization] in a way that actually influences what we see" (p. 429). The metaphor stretches the mind into an innovative, yet rational, conceptualization of reality through describing the intangible in tangible terms and linking predictable objective reality to subjective indiscernible phenomena. Thus a metaphor is a cognitive map of organizational dynamics.

To bring metaphorical illumination to the organization system of a constructivist learning community, French Jesuit scientist and philosopher Pierre Teilhard de Chardin's (1881-1955) theory of evolution is utilized. Teilhardian thought applied in both an organizational and educational context is a unique contribution to both disciplines.

Teilhardian thought is sometimes abstract and esoteric but also intellectually challenging and reflectively stimulating. His theories are grounded in empirical scientific research and rigorous philosophical inquiry. He conducted extensive paleo-anthropological field research into human origins producing over 200 scientific publications (Birx, 1991). However, paradoxically, some of his writings are poetical avant-garde intellectualism, metaphysical

mysticism, and that of an idealistic futurist. These qualities have lead some to coronet him father of New Age scientism (Ferguson, 1980; Lane, 1996; Smith, 1988). Teilhard writes (1968a; 1968b): "The past has revealed to me how the future is built and preoccupation with the future tends to swept everything else aside ... I am a pilgrim of the future on my way back from a journey made entirely in the past" (pp. 131, 101).

Extracted Teilhardian scientific and philosophical concepts, interpreted pragmatically, regarding social and psyche evolution, are congruent with many notions of cognitive and social constructivism and learning community thought. Thus a Teilhardian metaphor of a constructivist learning community organization is rational and uniquely insightful. The Teilhardian metaphor is not a predictive model of a constructivist learning community process but is descriptive of the organizational system.

Teilhardian Epistemology and Research Methodology

A scholarly application of Teilhardian thought requires that consideration be given to his epistemological orientation and research methodology. His theory of knowledge and research strategy is intricately connected.

Teilhard is an interdisciplinarian. Broadly defined, interdisciplinarity rests upon the premise that all knowledge sources are holistically interrelated and interconnected. Interdisciplinarians integrate multiple knowledge sources in a way distinctly different than those defined by disciplinarian specialists (Vickers, 1992). Teilhard sought to integrate scientific, philosophical, sociological, and theological knowledge sources into a logically valid epistemological synthesis (Cowell, 2001; Lane, 1996; Provencal, 1998; Roberts, 2000; White, 2001).

He believed that scientific specialization had resulted in important advancements. However he feared that the trend toward extreme specialization would inevitably lead to an irreconcilable fragmentation of knowledge. Such a fragmentation will ultimately constrict our ways of knowing and dilute our ability to comprehend reality holistically. To support his position, he pointed to the fact that the evolutionary extinction of species is due to over-specialization. Extreme specialization is limiting in scope and does not allow adaptation thus it is a static world-view (Birx, 1991; Dobson, 1984; White, 2001). Therefore, Teilhard's epistemological orientation is exploring innate interdisciplinary relationships that exist between knowledge sources which have the potential to produce new

knowledge necessary to advance humankind (Teilhard, 1999; King, 1989 and 1996; O'Connell, 1982).

Teilhard termed his research methodology *Scientific Phenomenology*. Teilhardian Scientific Phenomenology is an integrative synthesis of scientific inquiry (objective empiricism and positivistic quantitative measurement) with phenomenological descriptive analysis (the subjective qualitative essence of conscious phenomena). Segregated scientific research provides knowledge of physical reality while philosophical analysis exposes metaphysical reality. Accordingly, a synthesis between knowledge of the physical world coupled with the vitality of the metaphysical world would impart greater depth of understanding regarding the structure of reality.

He applied Scientific Phenomenology research in order to acquire a holistic understanding of creative evolutionary processes. Such an ambitious goal requires an integrated analysis of evolutionary phenomena from both scientific examination and phenomenological observation.

The cornerstone of Scientific Phenomenology is that it merges the two methodologies into a new knowledge system. As such, Teilhard's epistemological interdisciplinarity and Scientific Phenmenology are rationally linked (Birx, 1991; King, 1981; McCarty, 1976; O'Connell, 1982).

Teilhardian Narrative of Evolution

Teilhard is an evolutionist. British scientist Charles Darwin's (1809-1882) theory of biological evolution and fellow Frenchmen Henri Bergson's (1859-1941) philosophy of creative evolution greatly influenced his thinking (Birx, 1991; Cowell, 2001). Teilhard (1999) wrote:

> Evolution is the general condition to which all other theories, all hypotheses, all systems must bow and which they must satisfy henceforth if they are to be thinkable and true. Evolution is a light illuminating all facts, a curve that all lines must follow. (p. 27)

Teilhardian narrative of evolution is from the perspective of systems thought (Capra, 1988; Dobson, 1984; Kraft, 1983). Systems theory is the scientific notion that an organization is a web of interconnected and interrelated variables. These variables are so closely connected that they cannot be completely segregated into parts. He describes the Earth's evolution as occurring in distinct creative phases resulting in the systematic organization of earthly spheres: (a) pre-life, (b) life, and (c) thought.

The first stage was from a point of disorganized elementary particles converging into pre-life matter. This is the physical organization of planet Earth, the pre-life *Geosphere*. The second stage is emergence of organic matter converging into the organization of complex life forms upwards to the emergence of plants and mammals – the life-based *Biosphere*. Most significantly, this stage produced Homo sapiens (humankind) who possess a complex cerebral system resulting in psyche and reflective thought. The capacity for reflective thought, meta-cognition, psyche or consciousness, means that humankind is the apex of past evolutionary events and the leading shoot of future evolutionary movement (Birx, 1991; Teilhard, 1995; 1999). Because we know and understand evolutionary processes, humankind is evolution reflecting upon itself and consciously directing it's own movement. Thus evolution is continuing through humankind in the social and psyche realms. For Teilhard, this is the key to understanding future evolutionary movement (Provencal, 1998; Roberts, 2000; Teilhard, 1995, 1999; White, 2001).

The shift of evolution to the social and psyche realms is the formative stage of a new sidereal sphere – the thought-based *Noosphere*. The prefix *"noos"* is from Greek meaning mind (Birx, 1991; Cowell, 2001; Lane, 1996; Teilhard, 1995, 1999).

The formation of the Noosphere has two distinct stages. The first stage of was that of divergence. This is when humans began to spread across the Earth and organized themselves into societies. The current phase is that of convergence. This is where societies are now integrating forming new social organizations and networks of thought on a planetary scale. With modern advances in technology, communication systems, and transportation, Noospheric convergence is systematically becoming increasingly dense. The social organization of international institutions coupled with transnational interconnections of information and thought are creating a state of global consciousness. Thus we are living in the embryonic stage of the Earth acquiring a global brain and cultivating a planetary mind. The Noosphere is metaphorically described as a semi-imposed layer of thought forming around the planet like a neurological membrane (Teilhard, 1999).

Projecting his theory of Noospheric evolution forward, Teilhard conjectured a rather cavalier history of the future. That is, he sees humankind's ultimate destiny as the convergence of a fused global society forming a totally unified system of planetary collective consciousness (Birx, 1991; Cowell, 2001; King, 1996; Teilhard, 1975, 1995, 1999).

The Law of Complexity and Consciousness

Teilhard argues that reality is composed of systems interacting between complexity and change. The systematic interaction between complexity and change has driven evolutionary movement and creative processes (Birx, 1991; Dobson, 1984; King, 1989; Kraft, 1983; Teilhard, 1999). This interaction exists between two distinct, yet interconnected, energies: physical energy that forms matter and psyche energy that forms consciousness.

He observed that, systematically as physical energy increases in material organizational complexity there is a change in the degree of psyche energy or consciousness. Scientifically, just as energy becomes matter at a low enough frequency, matter becomes consciousness at a high level of organizational complexity. He formulated this interplay between complexity of physical energy and a corresponding change of psyche energy as the *Law of Complexity and Consciousness (Law of Complexity/consciousness)*. He proclaimed that this law is the key to understanding the organizational structure of reality (Birx, 1991; Cowell, 2001; Lane, 1996; King, 1996; Smith, 1988).

The Law of Complexity/consciousness rests upon specific postulations. First, there exist external physical and internal psyche energies throughout reality. The external physical energy is termed *tangential energy*. Tangential energy is the classical mechanistic energy of Newtonian physics governed by the laws of cause and effect, quantitatively measurable, and is the focus of conventional scientific inquiry.

The internal psyche energy is termed *radial energy*. Radial energy is barely measurable in the physical realm thus historically it has been scientifically disregarded. Radial energy is the metaphysical energy of the psyche (consciousness), which is qualitatively observable, regulated by a process of pattern probability (Birx, 1991; Dobson, 1984; McCarty, 1976; Roberts, 2000). Evolutionary movement toward increasing tangential energy results in complex material organization producing predictable elevated patterns of change in radial energy. Thus these two energies, though distinctive, are intimately interrelated (Birx, 1991; Cowell, 2001; Lane, 1996; Teilhard, 1999).

Second, the dialectical interaction between these energies systematically drives evolution process into new organizations. Examples of this process are the formation of the Geosphere, Biosphere, and the current development of the Noosphere.

Finally, he deductively reasoned that if the psyche, reflective consciousness, appeared with the arrival of the human phenomenon,

due to the organization of previous matter, then it must have pre-existed within matter, even if at a minute level. Therefore at the heart of matter, from the elementary sub-atomic level upwards, there is at least a minute kernel of consciousness in existence (Teilhard, 1995; 1999).

The Principles of Socialization and Personalization

Teilhard surmised that because evolutionary movement is continuing through humankind, there is still an interaction between external tangential energy and internal radial energy governed by the Law of Complexity-consciousness. The Teilhardian *Principles of Socialization* and *Personalization* correlate to this assertion.

The Principle of Socialization is external tangential energy moving humankind toward increasing physical organization. Socialization is an inherent drive whereby all that exists tends to converge and organize societies (Teilhard, 1999). An example of socialization is the convergence and organization of energy to atoms, to molecules, to cells, upward to biological species and Homo sapiens. Accordingly, humankind has collectively inherited an unconscious energetic drive to converge and physically organize into societies (Birx, 1991; Cowell, 2001; Dobson, 1984; King, 1989, 1996; Kraft, 1983; McCarty, 1976; Provencal, 1998; Provenzano, 1993; Roberts, 2000; Smith, 1988).

This unconscious drive is manifested by social organization. The depth of current socialization can be measured by the organization of societies and social institutions. These social organizations are the springboards for future socialization phenomenon (King, 1989; Teilhard, 1975, 1995). Teilhard believed that humankind is approaching a critical point of socialization where organizational convergence will greatly intensify the complexification of the Noosphere on a global scale.

The Principle of Personalization is the internal radial energy of social evolution. It is the process of individuals increasing levels of consciousness. Change in psyche activity is activated through the convergence of humankind through socialization. The close association with others differentiates individuals and personalizes them. The more fully personalized the individual the greater the capacity to objectively analyze the external social world while becoming subjectively aware of their own internal psyche development (Teilhard, 1969, 1995, 1999; White, 1997). The Teilhardian notion of personalization has a close affinity to the Swiss psychologist Carl Jung's (1875-1961) concept of individuation

(Cowell, 2001; Edinger, 1984; Sharp, 1991; Young-Eisendrath & Dawson, 1997). The greatest difference between Jungian individuation and Teilhardian personalization is the emphasis on the latter's collective social relations in the process of individuals achieving differentiated self-actualization (Teilhard, 1999; 1995).

Personalization is in stark contrast to the sociological notion of individualism. Teilhard staunchly advocated preserving individual diversity, but he rejected individualism. For him, individualism simply breeds egocentric isolation from others resulting in the fragmentation of societies. The personalization experience is not separation from others but rather community with others (Teilhard, 1995; Lignuel, 1968; White, 2001). Personalization culminates in drawing the individuals outside themselves and opens them to the world of persons where authentic being is discovered through community relationships (Dobson, 1984; King, 1989; Lignuel, 1968). The aspiration of the person is to build up a community of persons through facilitating socialization and collective cooperation (Browning, Alioto, & Faber, 1973; King, 1989; Roth, 1998). Teilhard believed that externally – physically – a human is merely an individual member of society, but the essence of the individual internally is the person – consciousness (1995, 1999).

Thus personalization is a state of intensified consciousness that emerges out of organized social relationships (i.e., socialization). The individual fully achieves personalism as they become differentiated from others, yet see others as themselves and themselves as others, while honouring these differences (Teilhard, 1969, 1995, 1999). The Principles of Socialization and Personalization are interconnected and interrelated systematically pushing social and cognitive evolutionary processes.

Teilhardian Metaphor of a Constructivist Learning Community

These Teilhardian concepts of social-psyche evolution discussed are congruent with constructivist theory and learning community thought. The similarities between these ideas can serve as the theoretical underpinning for an organization metaphor of a constructivist learning community. A description of the metaphor in a Teilhardian context follows.

First, the organization is a learning system. As a learning system, it is an evolutionary organization of interconnected and interrelated relationships governed by the Law of Complexity-consciousness. The Law of Complexity-consciousness governs the organization's external

physical (social) interactions and internal psyche (cognitive) dynamics. Accordingly, as the external physical interactions move toward increasing *complexity* there is a corresponding *change* with internal psyche dynamics.

Likewise, in a Teilhardian context, the organizational system consists of tangential energy (physical energy) and radial energy (psyche energy). Tangential energy is defined as the learning community's social relations. Radial energy is defined as the learning community's cognitive activity. Thus as social relationships become more complex there is a corresponding change in the quality of cognitive activity. This assertion corresponds to the Teilhardian Principles of Socialization and Personalization and the constructivist learning community's organizational system.

The Principle of Socialization is metaphorically descriptive of the constructivist learning community's social dynamics. Predictably the community will be in evolutionary movement toward greater community convergence resulting in a complex social relationships and a tightening of cognitive bonds. Teilhardian socialization is linked to the constructivist assertion that social integration is the most resourceful context for cognitive development and knowledge construction (Putney, 1996; Kozulin, 1990; Tharp & Gallimore, 1988; Wertch, 1985;Wink & Putney, 2002; Vygotsky, 1978).

The Principle of Personalization is metaphorically descriptive of the cognitive activity within the learning community. In this respect, Teilhardian personalization is akin to the Vygotskyian theory of intersubjectivity. Vygotsky (1978) wrote "the individual constructs the idea of his own person in the likeness of another individual" (p. 87). He believed that an individual's cognitive (psyche) functioning derives from participating in social interactions. These interactions within organized social processes result in an internalization of knowing and a transformation of the individual (Wink & Putney, 2001; Wertch, 1996). This assertion is visualized as the personalization process. There is a qualitative change in cognitive development and self-actualization (personhood) due to the socialization with others in the community.

The Principles of Socialization and Personalization are in systematic interaction energizing the learning system. The organization is evolving toward becoming a constructivist learning community, which is the catalyst for perpetual knowledge construction.

As described, the Teilhardian metaphor is a reflective appraisal of the constructivist learning community as an organizational system.

Teilhardianism metaphorically provides a mental map in which to visualize the constructivist process and community organization as an evolutionary learning system. As an evolutionary learning system, it is in movement toward greater social and cognitive communal activity resulting in the construction of new knowledge and learners' cognitive development (see Figure 1).

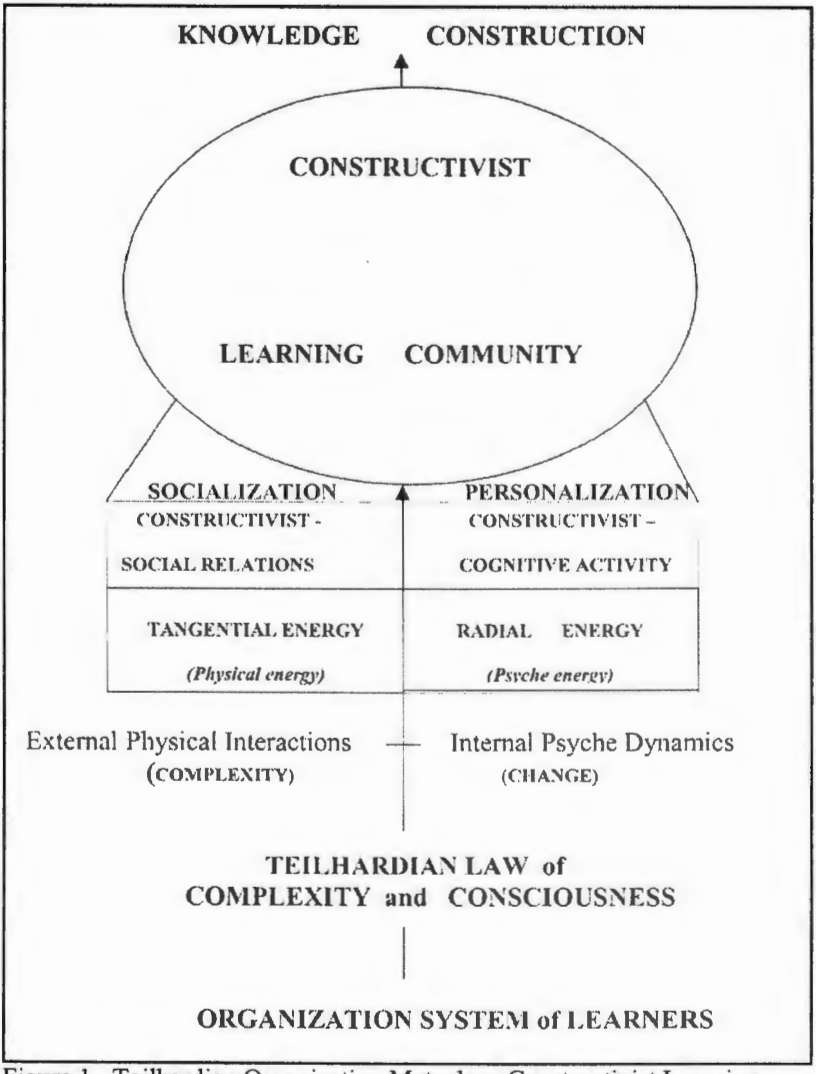

Figure 1. Teilhardian Organization Metaphor: Constructivist Learning Community.

Critical Assessment of the Teilhardian Metaphor

As with any metaphor, the Teilhardian metaphor is not exhaustive in scope. By design metaphors silhouette thought patterns and create new visualizations. Metaphorical vulnerabilities can lead to misconceptions (Grant & Oswick, 1996; Morgan, 1997). This assertion is nonetheless with the Teilhardian metaphor.

First, there is the language of constructivism and Teilhardianism that are sometimes difficult to reconcile. Frequently Teilhard uses the term psyche as an open-ended concept. Examples of this are his blurred uses of psyche *(noos)* as meaning mind, consciousness, or spirit. Can the Teilhardian notion of psyche or conscious evolution logically correspond to cognitive development and knowledge construction? To do so does require a liberal and not a literal understanding of constructivism and interpretation of Teilhardianism.

Second, harsh disparagement has been aimed at Teilhardianism regarding the rigor of Scientific Phenomenology, the validity of Law of Complexity/consciousness, objectivity of radial energy, and the soundness of socialization and personalization concepts. These scathing criticisms are well documented and do have merit (Birx, 1991; Lane, 1996; Smith, 1988). Obviously, these criticisms spill over into an extension and application of Teilhardian thought. For educationists, with a strict objectivist and pragmatic adherence, the criticisms can present a severe stumbling block.

Third, there is the risk of taking Teilhardianism too literally and converting it into an uncompromising ideology. Historically, some Teilhardian scholars, fueled by the fire of his inspirational vision of global socio-conscious evolution, have become dogmatically zealous, theoretically pompous, and ideologically pretentious (Lane, 1996; Provencal, 1998; Smith, 1988). Attitudes such as these can have negative educational consequences, as the Teilhardian metaphor becomes a political manifesto in regard to what "ought to be" in regards to a constructivist learning community. This sort of thinking can potentially fragment a learning community, create dysfunctional pedagogical practices, and promote ideologues as leaders.

Equally important, there is the question of members of the learning community acceptance of the Teilhardian metaphor. There are many vociferous social groups, political interests, and educators who dissent from any notion of evolution. This is particularly true in regards to an educational evolutionary orientation.

Similarly problematic is that the community's demographics will most likely be diverse learners from different socioeconomic and cultural backgrounds. Learners that come from marginalized groups

or divergent cultural milieus will most likely find it difficult to ascribe to a Teilhardian vision. Teilhardianism is a decidedly idealistic and an overtly utopian Western world-view. Can such a perspective seem relevant to a diversified multicultural learning community? Thus the metaphor may not have the strength to unite the learning community into a common organizational vision.

Another problem area is the assumption that the greater social complexity the more enhanced cognitive activity and knowledge construction. Metaphorically, the inferred implication is that the larger learning organization – classroom or school – the greater cognitive development and knowledge construction. However, the consensus of academic research, and the expert opinion amongst educators, is that the smaller the learning context the more fruitful the learning outcome (Bennett deMarrais & Lecompte, 1999). This conclusion is in acute contradiction to Teilhardian thought.

Finally, most educators are profoundly pragmatic in their orientation. The Teilhardian metaphor is highly abstract. This is problematic for educationists who desire to simply explore the productive and practical implications of a constructivist learning community. In our age of political liability regarding assessment-based learning, a pragmatic approach to a constructivist learning community will concentrate on meritorious accountability, objective cognitive measurements, and quantitative learning assessment. These are the foundation of objectivism in education. The Teilhardian metaphor focuses on the reflective subjectivism of a constructivist learning community. As a result, there exists tension between the educational realism of organizational objectives and the idealism of the Teilhardian metaphor and organizational dynamics.

The feasibility of these problems is very real. Nevertheless, counter arguments can be provided with regard to these problems.

Regarding the metaphorical language reconciliation, it is deferentially noted that constructivist purists and orthodox Teilhardians will have some validity in taking issue with the usages. Some metaphorical interpretations are not in exactness of constructivism or to the letter of Teilhardianism. However, they do hold integrity in relation to metaphorical musings.

Teilhard refused to allow his ideas to be shackled by the constraints and limitations of conventional scientific findings and philosophical deliberation. Often his interpretations of scientific ideas and philosophical concepts are liberal, subjectively animated, narratives. For him, it is the intent and spirit of an idea being communicated that outweighs linguistic precision. Where he found

the terminology to be an inadequate vessel to hold the depth of an idea, he defined the term accordingly while maintaining the essence of the concept. He did so with scholarly integrity and intellectual veracity. The development of this metaphor ascribes to this precedent while attempting to remain true to the essence of constructivism and to the spirit of Teilhardianism.

In response to critics of his scientific orientation, many findings in the New Science and systems theory seem to support many Teilhardian notions (Dobson, 1984; Jungerman & Cobb, 2000; King, 1996; Roberts, 2000). These scientific findings are being applied to postmodern organization theory (Morgan, 1997; Wheatley, 1996). Given this, Teilhardian thought should not be discounted as simply esoteric metaphysical speculation or mystical scientific fiction, at least in totality. The fact may be that his theories are still far ahead of current scientific investigation and the established philosophical culture.

When considering smaller class size and corresponding increase in the quality of learning, we can conjecture that Teilhard may have been in agreement with these conclusions. That is, in a Teilhardian sense, it is not the size of a constructivist learning community (classroom or school) that is the focus, but the aggregate complexity of diverse social interactions within the constructivist learning community. Greater diverse community convergence results in complex relationships within the learning community. The result is a more vigorous socialization and personalization dynamic. Therefore, the learning community's organizational size, though a critical factor, does not exclude the importance of complex social convergence and psyche transformation resulting in knowledge construction and learners self-actualization (Teilhard, 1969, 1995, 1999).

Conclusion

A metaphor by definition is abstract and visionary in relation to the macro-logical dynamic of an organizational model. The Teilhardian organization metaphor challenges educationists to reflectively evaluate basic assumptions relative to social relationships, cognitive development and knowledge construction. As a result, they are better prepared to recognize and understand unconventionally collective social and psyche energies inherent in a constructivist learning community organization.

The significance of Teilhardian thought is evidenced recently within the European academic community. The British Teilhard Association and the French Teilhard Association, in juxtaposition

with the University of Sussex in Great Britain, have begun a meticulous project to translate Teilhard's writings into the English language. Over the next ten years a select international and interdisciplinary committee of academicians will conduct an analysis and assessment of his writings. The primary objective is to place Teilhardianism into a contemporary context. This ambitious project promises to create a resurgence of interest in Teilhard's pioneering scientific work and avant-garde intellectualism. This study may complement such an endeavor by infusing Teilhardianism into the domain of organization theory and educational thought.

REFERENCES

Bennett-DeMarrais, K. & LeCompte, D.M. (1999). *How schools work: A sociological analysis* (3rd ed.). New York: Addison Wesley Longman.

Bertrand, Y. (1996). *Contemporary theories and practices in education.* Madison, WI: Atwood Publishing.

Birx, H.J. (1991). *Interpreting evolution: Darwin & Teilhard de Chardin.* Buffalo, NY: Prometheus Books.

Boyer, E.L. (1995). *The basic school: A community for learning.* Princeton, NJ: Carnegie Foundation.

Brooks, J.G. (February, 1990). Teachers and students: Constructivists forging new relationships. *Educational Leadership, 47,* 68-71.

Browning, G., Alioto, J.L., & Farber, M. (Eds.). (1973). *Teilhard de Chardin: In quest of perfect man.* Madison, NJ: Farleigh Dickson University Press.

Capra, F. (1988). *The turning point: Science, society, and rising culture.* New York: Doubleday Books.

Cooper, C. & Boyd, J. (1999). *Schools are collaborative learning communities.* Tasmania, Australia: Global Learning Communities.

Cowell, S. (2001). *The Teilhard lexicon.* Brighton, Great Britain: University of Sussex Press.

Crook, C. (1994). *Computers and the collaborative experience learning.* London: Routledge.

Dobson, E.O. (1984). *The phenomenon of man revisited: A biological viewpoint on Teilhard de Chardin.* New York: Columbia University Press.

Edinger, E.F. (1984). *The creation of consciousness: Jung's myth for modern man.* Toronto: Inner City Books.

Edwards, D. & Mercer, N. (1987). *Common knowledge: The development of understanding in the classroom.* Cambridge, MA: Harvard University Press.

Ferguson, M. (1980). *The Aquarian conspiracy: Personal and social transformation.* Los Angeles, CA: J.P Tarcher, Inc.

Grant, D. & Oswick, C. (Eds.)(1996). *Metaphor and organizations*: Thousand Oaks, CA: Sage Publications.

Gray, A. (1999). *Constructivist teaching and learning.* Saskatoon, SK: University of Saskatchewan.

Jalongo, B. (1993). *Creating learning communities: The role of the teacher in the 21st century.* Bloomington, ID: National Educational Service.

Joyce, B. & Weil, M. (1996). *Models of teaching*. Heights, MA: Ally and Bacon.
Jungerman, J.A. & Cobb, J.B., Jr. (2000). *World in process: Creativity and interconnection in the new physics*. Albany, NY: State University of New York Press.
King, T.M. (1981). *Teilhard's mysticism of knowing*. New York: The Seabury Press.
King, U. (1989). *The spirit of one earth: Reflections on Teilhard de Chardin*. New York: Paragon Press.
King, U. (1996). *Spirit on fire: The life and vision of Teilhard de Chardin*. Maryknoll, NY: Orbis Press.
Kline, J.T. (1990). *The interdisciplinarity: History, theory, and practice*. Detroit, MI: Wayne State University.
Kozulin, A. (1990). *Vygotsky's psychology: A biography of ideas*. Cambridge, MA: Harvard University Press.
Kraft, W.R. (1983). *A reason to hope: A synthesis of Teilhard de Chardin's vision and systems thinking*. Seaside, CA: Systems Publications.
Lane, D.H. (1996). *The phenomenon of Teilhard: Prophet for a new age*. Macon, GA: Mercer University Press.
Ligneul, A. (1968). *Teilhard and personalism*. New York: Paulist Press.
Macroff, G. (1993). *Team building for school change: Equipping teachers*. New York: Columbia University Press.
Moffet, J. (1994). *The universal schoolhouse: Spiritual awakening through education*. San Francisco, CA: Jossey-Bass Publishers.
Morgan, G. (1997). *Images of organization*. Newbury Park, CA: Sage Publications.
McCarty, D. (1976). *Teilhard de Chardin*. Peabody, MA: Hendrickson Publishers.
O'Connell, R.J. (1982). *Teilhard's vision of the past: The making of a method*. New York: Fordham University.
Piaget, J. (1970). *The science of education and the psychology of the child*. New York: Grossman.
Provencal, Y. (1998). *The mind of society: From a fruitful analogy of Minsky to a prodigious idea of Teilhard de Chardin*. Newark, NJ: Gordon and Breach Publications.
Provenzano, J.P. (1993). *The philosophy of conscious energy*. Nashville, TN: Winston-Derek Publishers, Inc.
Putney, L.G. (1996). You are it: Meaning making as a collective historical process. *Australian Journal of Language and Literacy, 19*(2), 129-143.
Roberts, N.K. (2000). *From Piltdown man to omega point: The evolutionary theory of Teilhard de Chardin*. New York: Peter Lang.
Roth, R.J. (1998). *Radical pragmatism: An alternative*. New York: Fordham University.
Sapiro, N. & Levin, J.H. (1999). *Creating learning communities*. San Francisco, CA: Jossey-Bass.
Sergiovanni, T.J. (1993). *Building community in schools*. San Francisco, CA: Jossey-Bass.
Sergiovanni, T.J. (1999). *Leadership for the schoolhouse*. San Francisco, CA: Jossey-Bass.
Sharp, D. (1991). *Jung lexicon: A primer of terms & concepts*. Toronto, ON: Inner City Books.

Smith, W. (1988). *Teilhardianism and the new religion: A thorough analysis of the teaching of Pierre Teilhard de Chardin*. Rockford, IL: Tan Books.
Starratt, R.J. (1996). *Transforming educational administration: Meaning*, community, and excellence. New York: McGraw-Hill.
Teilhard de Chardin, P. (1968a). *Letters to two friends: 1926-1952*. New York: New American Library.
Teilhard de Chardin, P. (1968b). *Letters from a traveler*. New York: Harper & Row.
Teilhard de Chardin, P. (1969). *Human energy*. London: Collins.
Teilhard de Chardin, P. (1975). *Toward the future*. London: Collins.
Teilhard de Chardin, P. (1995). *The future of man*. London: Collins.
Teilhard de Chardin, P. (1999). *The human phenomenon* (S. Appleton-Weber, Trans.). London: Collins.
Thayer-Bacon, B.J. & Bacon, C.S. (1998). *Philosophy applied to education: Nurturing a democratic community in the classroom*. Upper Saddle River, NJ: Prentice-Hall.
Tharp, R.G. & Gallimore, R. (1988). *Rousing minds to life*. New York: Cambridge University Press.
Tobin, K. & Dawson, G. (1992). Constraints to curriculum reform: Teachers and the myths of schooling. *Education Technology, Research, and Development, 40*(1), 81-92.
Twomey, F. (1989). *Enquiring teachers, enquiring learners: A constructivist approach for teaching*. New York: Columbia University Press.
Vygotsky, L.S. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
Wertsch, J. (1985). *Vygotsky and the social formation of the mind*. Cambridge, MA: Harvard University.
Wheatley, M. (1996). *Leadership and the new science: Learning about organization from an orderly universe*. San Francisco, CA: Barrett-Koehler Publications.
White, S.R. (1997). *Social reconstructionism and global education: Constructivist pedagogy in an era of global change*. Unpublished doctoral dissertation, Idaho State University, Pocatello, Idaho.
White, S.R. (2001). Reconstructionism and interdisciplinary global education: Curricula construction in a Teilhardian Context *International Education Journal*, 31(1), 5-23.
Wink, J. & Putney, L. (2002). *A vision of Vygotsky*. Boston, MA: Allyn & Bacon.
Woolfolk, A.E. (1998). *Educational psychology*. Boston, MA: Allyn and Bacon.
Vickers, J. (1992). Comparing disciplinary and interdisciplinary claims: How much discipline? *Association for Canadian Studies Working Document on Interdisciplinairty*, 5-14.
Young-Eisendrath, P. & Dawson, T. (Eds). (1997). *The Cambridge companion to Jung*. Cambridge, MA: Cambridge University Press.

Stephen R. White is an assistant professor in the Reich College of Education at Appalachian State University. He holds the Doctor of Arts (D.A.) Degree in political science and interdisciplinary social sciences. He has extensive post-secondary education teaching experience in community college, undergraduate, and graduate degree programs. Formerly, he was a systems analyst with the Federal Reserve Bank. His research interests are the foundations of education, constructivist theory, pedagogical scholarship, organization theory, curriculum development, leadership praxis, educational administration, policy analysis, and exploring the relationship between spirituality and education. A particular interest is infusing French philosopher Pierre Teilhard de Chardin's theory of social and conscious evolution and Swiss psychologist Carl G. Jung's theories into educational thought. Dr. White has presented research extensively. Publications include works in the *Journal of Instructional Psychology, International Education Quarterly, American Secondary Education,* and *New Directions in Higher Education.*