Why metaphor matters in education[1]

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I track the influence, presence and pivotal role of changes in the understanding of metaphor, which accompanied the paradigm shift from objectivism to pluralism and relativism in education. These shifts are also reflected in the choice of teaching methodology. I argue that metaphors are constitutive of educational activities, events and processes and that they inter alia *mediate foundational world view assumptions of these events and activities. Metaphor carries epistemic and ideological freight, functions as a vehicle of a world view and provides access to a discipline's assumptions about the way the world and humankind are structured.*

Why do metaphors matter?

There is a widespread recognition of the fact that metaphors play a significant aesthetical, ornamental and pedagogical role not only in literature but also in education. This positive appreciation does not necessarily differentiate between the different ways that metaphors function on diverse levels in education. It also does not necessarily imply that metaphors have cognitive import or play a constitutive role in theorizing. Much of this lack of discernment concerning the role of metaphor has to do with the fact that many educationalists still adhere to the "double language thesis". In this thesis the fundamental distinction between literal and metaphorical language assumes an ascription of primacy to literal language. This thesis has been subjected to critique on all sides mainly on the basis of the fact that it does not allow for the recognition of metaphors constitutive of the theories underlying the pedagogical practice of teaching and learning or the acceptance of the fact that metaphors and models are essential and constitutive of the subject matter being taught or learnt. It also does not recognize that metaphor and analogy fulfill more than instrumental but indispensable role in mediating the acquisition of new knowledge.

In order to achieve a better understanding of the role of metaphor in education a number of things must be done:
- An exploration of the way metaphor is used in education in general;
- a clarification of the different levels on which metaphor functions;
- an overview of the fundamental changes that have taken place in the understanding of the nature of metaphor; and
- an illustration of the constitutive role of metaphor in objectivist and constructivist teaching methodologies.

Definitions of metaphor abound: Perhaps the simplest one with respect to education defines metaphor as seeing, describing or interpreting some unfamiliar educational phenomenon, event or action in terms of a familiar thing,

event or action (e.g. teachers are guides, learning is an uphill battle). A more sophisticated description is one by Scheffler, (1979:128-130) who says: Metaphors are "… inventions of thought to explore a certain kind of possibilities in a heuristic way". They give rise to ideas and hypotheses which can be explored and perhaps even tested. They act as powerful cognitive models through which educators and learners can understand educational phenomena by relating them to something previously experienced. As Petrie and Oshlag (1993:58) state "… metaphor is one of the central ways of leaping the epistemological chasm, between old knowledge and radically new knowledge". And it is exactly the creative and innovative and interactive role of metaphor which creates the similarities between a student's earlier understanding and the acquisition of new knowledge of an unfamiliar topic. Where metaphor is seeing, describing or interpreting one thing, act, event or experience in terms of another, recent theories, following Black (1962; 1977; 1993) have shown that in a metaphor an *interaction* takes place between two semantic fields. This leads to the creation of a novel meaning. From this perspective metaphorical meaning is not merely the comparison of traits of two entities or the substitution of a more literal meaning for a metaphorical one — both reductionist strategies — but the creation of novel meaning by means of interaction in which the meaning of both the literal and metaphorical elements of the two semantic fields are shifted and a new meaning is generated. Reductionist strategies in the use of metaphor (comparison and substitution) are not as productive and innovative as the interactive creation of radically new meanings are (Black). This is confirmed, with respect to education, when Petrie and Oshlag (1993:585) say:

> Interactive metaphor would allow truly new forms of knowledge and understanding to be acquired by the student without presupposing the student already knows, in some sense, that which is being learned.

In contrast to views that see metaphor mainly as ornamental or an aesthetic device, I agree with Hesse (1983) that metaphors make cognitive claims, permeate all language use and are constitutive of most higher level theories.

In this article I propose to track the influence, presence and pivotal role of changes in the understanding of metaphor which accompanied the paradigm shift from objectivism to pluralism and relativism in education. I shall argue that these shifts are also reflected in the choice of teaching methodology. These shifts manifest themselves at various levels in the process of education. This position assumes a relationship between underlying philosophical assumptions and pedagogy. It also assumes that metaphor also functions as a vehicle of a world view. For this purpose the notion of a *root metaphor* is employed. Pepper emphasizes that root-metaphors or world hypotheses are often generated from everyday experience and then extrapolated by means of analogy to some other realm of experience. It often functions as a philosophy, metaphysics or world view which constitutes the ultimate presuppositions or frame of reference for discourse on the world or a domain within it (Pepper, 1942; 1973; 1982; Brown, 1977:125; Botha, 2007:156). Metaphors are consti-

tutive of the theories underpinning education at its various levels. This requires that the teacher be educated to discern the presence and role of metaphors at these various levels, that students and learners are taught the rhetoric of the universe of discourse and conceptual framework of a specific field, in order to discern the underlying assumptions and world views at work in the discipline (Postman, 1996:ch.9). Both students and teachers need to come to terms with the foundational nature of these metaphors that carry the ideological freight (Eubanks, 1999:419-442) of a discipline. Moreover it is important to note that there is no single metaphor that can best capture all of the complexities of the educational phenomena under investigation and that any phenomenon can effectively be accessed by a multiplicity of metaphors. Educational phenomena are complex and require careful analysis in order to ascertain the type of metaphors and the levels at which they function.

Reigning in the topic
Primary, secondary and tertiary education takes place in schools but differ in their goals and objectives. Most of what follows is applicable to all levels of teaching and education, but the focus in this article is primarily on the role of metaphors as world views in education at a tertiary (college and university) level. A provisional list[2] of roles of metaphor includes:
1. Metaphors could be constitutive to the *educational policies* we devise, e.g. the "market" metaphor or school choice (goods, services, consumers).
2. They can also be constitutive of the *teaching process* (e.g. teaching as orchestrating, conditioning, guiding or training).
3. They could function heuristically as a *tool for discovery* (spiral staircase or ladder).
4. The often function didactically as *approaches to teaching* (dramatization and role playing).
5. They some times qualify the *teaching actions* of the teacher (pottery, gardening, artistry, policeman, entertainer, sermonizer, scholar, a guide, a coach, a researcher, a sculptor, conductor, gardener, mid-wife, etc.).
6. At times they determine the way the *learner or learning process* is seen (sponge, filter, funnel, and strainer).
7. They are also characteristic of the content of the *subject matter* that is being taught and this in turn is often determined by the curricular metaphors (system, mechanism, organism) within which the subject matter is taught.
8. Metaphors can function as tools for *communication*.
9. Metaphors mediate the understanding of the *nature of the school* as educational institution (family, factory, etc.).
Acquisition of knowledge takes place on a number of dimensions. A significant distinction is the distinction between pedagogy in general and *pedagogical content knowledge* (Schulman, 1986; Petrie & Oshlag, 1993:590-591) specifically. The latter is the type of knowledge of the specific pedagogical requirements of a specific field of knowledge. Theories and practice are present at

both the general and the specific level. Another dimension is that of the subject matter being taught. When paradigm changes take place in these various dimensions they are often accompanied by shifts in the underlying epistemology of the theories dominant on that level. These changes in turn are reflected in different teaching methodologies. In all these dimensions and on a variety of levels metaphors play a significant role. The complexity is compounded even more when it is taken into consideration that metaphors chosen to qualify the task of the school also have consequences for views concerning the practice of teaching.

Education is a comprehensive term. It covers the acts and events that are typical of education, like teaching and learning, the theories and policies that govern these activities and ultimately also the type of institutions within which these processes take place. Metaphors are found in all these diverse areas of education and they are also constitutive of the models and theories that form the subject matter of the various disciplines taught in schools and universities. Education and teaching can take place in a large variety of settings of which the school is but one. Industrial workshops, church-related retreats and political caucuses all utilize some form of education, but this is not necessarily similar to education in the school. So when one is attempting to track the role of metaphor in education and teaching, it also requires a closer look at education and teaching in a school setting. In this article I intend to focus more specifically on the role of metaphor in the transmission of a body of knowledge

A "mortuary body" of knowledge: the demise of the objectivist paradigm of knowledge

Pedagogies based on an objectivist understanding of knowledge differ from those based on a more constructivist approach. The former approaches are characterized *inter alia* by a lack of appreciation of the cognitive import of metaphor. Absence of the recognition of the cognitive import of metaphor Johnson (1981) attributes to the legacy of the "troubled life of metaphor", which has its antecedents in the classical or traditional view of metaphor, initiated by Aristotle. In this view there is a fundamental difference between literal and metaphorical language. The literal is given priority and the metaphorical is primarily seen as decorative or ornamental. Learning processes are "… primarily objectivistic, which means that knowing and learning are processes for representing and mirroring reality" (Jonassen, 1991:5). In learning theories cognitive learning models are devised to "… discover the most efficient mapping of external reality onto learners" (Jonassen, 1991:7). Methodologies of teaching are based on behaviourist mental models and a Cartesian bifurcation of reality and are rooted in objectivism (Jonassen, 1991:8). About objectivism, Jonassen, (1991:10) writes:

> Objectivism — the more common scientific conception of reality — holds that there is an objective reality that we as learners assimilate. The role of education is to help students learn about the real world. Students are

not encouraged to make their interpretations of what they perceive; it is the role of the teacher or the instruction to interpret events for them. Learners are told about the world and are expected to replicate its content and structure in their thinking.

This approach could be designated as the "mortuary view" of knowledge. Teaching based on positivist and objectivist assumptions assumes that the body of knowledge to be transmitted to the student is "dead". This means that the student passively receives the body of knowledge without taking responsibility for interactively appropriating the knowledge as his own. The radical demise of the objectivist paradigm in educational circles led to the rise of a variety of constructivist theories. Simultaneously with the demise of the objectivist paradigm of knowledge the research of Lakoff, Johnson, Turner, *et al.* (1980; 1981a; 1981b; 1986; 1987; 1988; 1989; 1999) proposed the existence of "conceptual metaphors" and argued that these conceptual metaphors are anchored in embodiment. The new embodiment theories of metaphor and empirical research concerning metaphor comprehension, in a wide variety of disciplines, brought about changes in the understanding of the nature of knowledge, reference, rationality, truth, meaning, reality, language and its relationship to the world.

Jonassen (1991:10-11) contrasts the objectivist approach with that of constructivism, which believes there is no real world, no objective reality that is independent of human mental activity. Constructivists hold to an important epistemological assumption that "... meaning is a function of how the individual creates meaning from his or her experiences". He points to some of the insights that can be gained from the latter theory. Their emphasis on instruction within context is one such an advantage and another strategy is the presentation of multiple perspectives to learners. On the other hand, views that do recognize the cognitive and constitutive role of metaphor in theorizing and the interactive view of knowledge formation will give rise to different approaches in teaching. The insightful articles of Ogborn (1997), Quale (2002) and Yob (2003) shed light on various aspects of this phenomenon.

In both approaches the *level* of the discussion needs to be identified. Theory or practise in pedagogy or in the subject matter of a discipline or pedagogical content knowledge, represents different facets of education. Recognition of the role of metaphor and choosing a specific understanding of metaphor (comparison, substitution or interaction view) will also have consequences for understanding the implications on all the mentioned levels. These theoretical positions require more systematic analysis, but are mentioned here to demonstrate that epistemological assumptions embedded in metaphors play a role in education. I assume that metaphors are prevalent at all the above levels of education and agree with Boyd (1993:358) that "... metaphor is one of the many devices available to the scientific community to accomplish the task of accommodation of language to the causal structure of the world ...". In the case of pedagogy the influence of metaphor is via the theories that underpin pedagogical practise (Miller, 1987:222) (e.g. students are sponges) and also via the content of the subject matter being taught (e.g. atoms are

[like] solar systems). In both these cases the interactive view of metaphor pro-
vides the best understanding of how metaphor mediates conceptual change
and becomes constitutively embedded in theories.

Metaphor in teaching

In a review essay titled "Thinking constructively with metaphors" Yob (2003)
reviews the work of Thayer-Bacon (2000), who provides us with a stimulating
example of the way these types of assumptions are at work in the process of
teaching. In this work Thayer-Bacon compares two different metaphorical ap-
proaches to teaching and learning. She applies the metaphor of a "quilting
bee" to the realm of teaching and learning. In this metaphor she draws heavily
on constructivism, critical thinking and a collection of feminist, womanist and
Third World thought (Yob, 2003:129). The quilt that emerges from the com-
bined activity of quilters is the accumulated and shared experience of a group
of thinkers. A quilting bee is a place of action. The metaphor conjures up a
number of *associated commonplaces*, as Black (1962) would say. Knowing is
a social enterprise, human beings are contextually embodied and they come
to know through their embedded bodies and minds (Yob, 2003:130). This
means the reason or mind is not the sole maker of knowledge, but that prac-
tical hands-on experience, emotion and intuition also play a role. She con-
trasts this with the symbol of an alternative prevailing viewpoint, Rodin's
sculpture *The Thinker*. She says:

> Here is a white male, solitary, detached, passive, representing the ideal
> knower, scholar or "man of letters". When these contrary grounding me-
> taphors are applied to classroom approaches, very different scenarios
> emerge. *The Thinker* predisposes one to imagine a classroom of quiet
> order, silent work, minds focused on abstractions, pupils sitting at desks
> with open books. The quilting bee conjures up a classroom full of talk,
> movement, manipulatives, experimentation, group projects, maybe some
> laughing, certainly some interaction with learning materials and each
> other ... (Yob, 2003:130-131).

Obviously both these metaphors have limitations, but they also convey two
different views of teaching and learning. The latter method emphasizes action
and interaction whereas the former method emphasizes the more objective,
distanced and abstract relationship of the learner to the object of study. The
curriculum to some extent also dictates the type of teaching required to ac-
complish its educational goals. In both these examples metaphors play a
significant role and convey some understanding of the meaning of the "world"
being portrayed.

Most teachers know experientially that their own view of the nature of
their task is often expressed by means of metaphor and that metaphor is one
of the central ways of leaping the epistemological chasm between old and radi-
cally new knowledge. When metaphor is seen as a comparison between selec-
ted similarities between two poles, it obviously can not lead to the acquisition
of new knowledge. The interactive view of metaphor on the other hand pro-

vides more cues for the substantiation of the claim that metaphor generates new knowledge. As the result of the interaction between two semantic fields a new field of meaning is construed which opens up new aspects of knowledge. But ultimately the context within which the metaphor is utilized sets the parameters of meaning of the new semantic field.

Quale (2002:454) says: "The act of teaching implies conveying a certain body of knowledge to the learners, and in so doing we cannot avoid also projecting an image of the "meaning" of this knowledge — i.e. an *epistemic content*". Quale argues that the teachers in the natural sciences will transmit to their students their understanding of the nature of science whether they are conscious of doing that or not. In teaching this often means that the teacher utilizes a text book with theories about the nature of the world and the nature of science that implicitly has a world view embedded in it — a world view that the teacher often tacitly adheres to and transmits to the student.

Root metaphors in and of education

Metaphor is one of the strongest pointers to the type and presence of world views and philosophical assumptions implicitly assumed or explicitly acknowledged in the theories as basis of the curriculum and pedagogy. It is important to note that "world view" in this context means the "scientific" world view of these two dimensions of education. (*cf.* Kuhn, 1973:ch.X: 11*ff*). It sets the boundaries for the permissible metaphors and analogies that are basic to a disciplinary paradigm. A number of other assumptions are basic to education in the comprehensive sense of the term. They include: the nature of humankind, of knowledge, of the school, of teaching and learning and the assumptions present in the subject matter of the theories being taught. There is a clear relationship between the metaphorical premises chosen to portray the nature of a school and those at the basis of the choice of a curriculum. For example: If one sees the school as a "factory", then it is just a small step to thinking about the curriculum as guideline for "production", the student as "raw material" and an even smaller step to visualize teaching and learning as processes that are aimed at some form of efficient production, rational control and testable outcomes. In this respect Cook-Sather (2003:954) says:

> The root metaphor of education as production and the multiple branches that spring from it — school as factory; curriculum as assembly line; teacher as factory worker, machine, or executive; and students as products — create a version of reality that is scarcely more humane than the construct of the Matrix.

If, on the other hand, the school is visualized as an institution with the primary qualifying task of "curing" the ills of society, the school needs to diagnose these ills, and provide prescriptions for therapy and treatment (Cook-Sather, 2003:956). In this scenario the teacher becomes a therapist and the student or society a sick patient in need of a remedy. Cook-Sather (2003:958) states that although these two root metaphors are ostensibly opposites they lead to similar effects in the learning processes of the students. Both keep students passive and managed by or controlled by teachers. She suggests that educa-

tion must be guided by life-affirming creative metaphors "… that unsettle, that expect students to seek, find and invent what we do not yet know, that lead us not only to imagine but also to create other possible worlds" (2003:959). These life-affirming creative metaphors foreground human relationships, interdependence, communication and various forms of evolution and stand in contrast to the mechanistic and medical models (2003:960). Examples of such life-affirming metaphors are those that strive for more humane ways to conceptualize and practice education. Examples are education as growth, learning as participation and the teacher as a gardener. The latter example has also been worked out extensively by Smith in his exposition of the educational philosophy of Comenius (Smith, 2000:38-51; 2007). Comenius also pursued other metaphors such as the metaphor of "light" which was introduced in his *Via Lucis* (The Way of Light) written in 1668 (Yob, 2003:137; Smith, 2000:40). Cook-Sather's own suggestion is to work with the metaphor of education as "translation" (2003:1961). To this one could add a large number of others: education as conditioning, narration/story telling, as formation, as power/control or mental discipline, as socializing, as civilizing, as recapitulation, etc.

One dimension of Cook-Sather's helpful analysis requires comment. As indicated earlier the term "root metaphor" originated from Pepper (1942) but is used in a variety of meanings by others. In the literature the term root metaphor is not used in a uniform manner. I prefer to use the term to indicate the deepest religious, philosophical or perhaps even mythological type of metaphor which lies at the "root" of a way of looking at educational phenomena Here I intend to use the term "root" in two possible ways: If we assume that the primary structural task of the school is the development or disclosure of cognitive abilities, discernment and cultural formation of the learners (wisdom), one could make a choice out of a variety of possible (root) metaphors in terms of which the structure of the school can be understood. The school as "plant" (biological growth), as "factory" (mechanical images) and "systems" are some of the more obvious ones that come to mind. Cook-Sather (2003:964) has made an extensive list of potential metaphors used at various levels of education. She says that these metaphors are value-laden and suggests that

> Every metaphor assumes or generates a lexicon, a vocabulary, a way of naming within the conceptual framework of the metaphor, which embodies and reflects certain underlying values, and which has the potential, if taken as totalizing, to eclipse other ways of thinking and behaving. (Cook-Sather, 2003:950).

This poses the question whether and when all metaphors are apt, "fitting" and equally able to provide access to the nature of reality. Clearly, there are limits to the potential multiplicity of metaphors that could be utilized in any specific case. But, what sets these limits and how are they determined? Ricoeur talks abut the "itineraries of meaning" which a metaphor provides, indicating that some meanings are out of bounds and could lead one astray. Part of the answer to the question about the limits of the itinerary of meaning is the fact that the world in which we live is an orderly and stratified world and that this

orderly stratification is also characteristic of all human acts, relationships, events, processes and experience. It is imperative that one obeys the limits and boundaries set by such entry points and does not become victimized by the choice of metaphor. Victimization implies reducing the wide diversity of educational phenomena to one perspective. Closely related to this form of reductionism is the tendency to identify the theory constitutive metaphor or models at work in theorizing, with full reality — a phenomenon called "metaphorical hypertrophy" (Weltman, 1973).

Metaphorical maps of meaning

The fact that metaphors harbour this potential to become "totalizing" indicate that they are not only indicative of the structure of education (e.g. business, healing, etc.) but that they can also harbour a second meaning, which I would like to call "directional" meaning. This refers to the fact that "No metaphor comes without ideological freight" as Eubanks, (1999:419-442) states. The choice to portray a school by means of business discourse is a choice for a specific understanding of the nature or structure of the school. So too is a choice to portray the school as the extension of the family. In both these choices, i.e. the school as business or as extended family, the decisive directional element is embedded in the form of sets of norms that have to be adhered to. Eubanks speaks of the "cultural motivation of metaphoric mappings" (1999). Aptness of metaphors and metaphorical mappings prove to be determined by "licensing stories" (truisms, personal anecdotes, recounted stories reflecting their ideologies). Eubanks argues that his re-examination of metaphor reveals complexly operating rhetorical patterns. He states that these patterns help to constitute conceptual metaphors and that the development of a richer account of metaphor as a cultural phenomenon is possible if the patterned relationship between metaphor and other discursive forms like "licensing stories" are considered (1999:420). His research showed that a "licensing story ... expressed the discussant's view of ... *how the world does work and how the world should work*" (1999:424-426). These licensing stories are often embedded in or form the basis of a "standard cultural allegory" (Eubanks, 1999:29). Elsewhere Eubanks says

> Licensing stories are narratively structured representations of an individual's ideologically inflected construal of the world. Metaphor aptness — which is to say, the aptness of possible mappings — depends crucially upon this (Eubanks, 1999:437).

Bullough and Gitlin (2001) express a similar idea when they claim that "... people are born into metaphorical meaning systems". This state of affairs also harbours some difficulties. Cook-Sather warns (2003:951) that if one embraces a single, definitive metaphor without acknowledging the premises underlying it, "... then the metaphor can be more deluding than illuminating". I would add that when "root" is used in the second sense it is closer to a *religious-directional* view of the world which indicates the fact that individual and communal allegiance to a specific root metaphor or a set of ideologically inflected metaphors are characterized by strong religious overtones. "Religion"

is used here in the sense in which Clouser (2005) suggests. These views of metaphor are a far cry from the Aristotelian legacy with its objectivist view of language — a legacy which also characterizes views of language in modernity. It is the changes in these views of metaphor that have led to new interpretations of the role of metaphors in a variety of fields and specifically education.

Perhaps the ideological inflection at stake here comes to expression in the choice of metaphors which inevitably lead either to objectivism on the one hand or to relativism on the other. In the objectivist and positivist tradition metaphor was ostensibly ruled out (*cf*. Neurath, 1973:ch.9) whereas with the growth of the recognition of the presence and role of metaphor in cognition the pendulum swung towards relativism, where there is no constant and invariable reality, no grand narratives and no total knowledge of the subject. On the contrary, the subject is decentred and local and particular knowledge and diversity of potential values are seen as characteristic of postmodern approaches to teaching

It needs little argument that these developments, in the understanding of metaphor and the revised view of cognition which followed from it, would impact the views of education, the school, its theories of teaching and learning, teachers and learners and the curriculum. All these dimensions of education harbour contextually embedded epistemological and anthropological assumptions which are conveyed to educational practice via metaphorical models. So what is it that the teacher attempts to achieve in the process of the interactive pedagogical disclosure of the meaning of reality?

Teachers: cutting the world at its joints

When it is acknowledged that most of the theories basic to teaching, learning and education find their sources in metaphor, then the acquisition of (metaphorically mediated) knowledge is per definition an interpretative activity embedded in patterns of action. This means that the learner should not only know that, for example, there is such a thing as "Systems Theory", but should be able to actively explore and unpack the sets of associated commonplaces and novel fields of meaning which such a metaphor unlocks.

Yes, poets use metaphors, but so do biologists, physicists, linguists and everyone else who is trying to say something about the world — says Postman (1996:173-174). Through metaphor we attempt to understand some unfamiliar thing, event or state of affairs in terms of another more familiar thing, event or state of affairs. We "... see the world as (if it is) one thing or another ...". A couple of more common examples are: Is history linear or circular? Is history unfolding according some instructions of Nature or according to a Divine providential plan? Are our genes like information codes? All these examples are rooted in overarching philosophical traditions and world views which dictate the itinerary of meaning of the basic concepts utilized. They harbour the implicit categorizations of the diversity and coherence of the world and the ideological freight embedded in these categorizations.

In Postman's classic book *The End of Education. Redefining the value of*

the school (1996:175) he states that "... definitions, questions, metaphors —
... are three of the most potent elements with which human language con-
structs a world view". Postman develops an intriguing chapter with the title
"The Word Weavers/The World Makers" (1996:172) in which he states that
many teachers have failed to notice the "... principal intellectual instrument
available to human beings ..." (1996:173; *cf.* Shulman, 1987), namely, ques-
tions, definitions and metaphors. He says that in most schools metaphor does
in actual fact come up, but usually taught by the English teacher illustrating
its use by poets. The effect of this type of teaching is that most students come
to believe that metaphor has a decorative or emotive function only. Moreover
the majority of students and teachers have a view of the nature of meta-
phorical language that juxtaposes it with "literal" language, which they would
regard as the primary form of language. Natural scientists are especially hard
to convince that their most significant theories are based on metaphors,
whereas some of the most significant work in the area of metaphor has been
done by mathematicians and physicists! (*cf.* Hesse, McMullin, Lakoff, and
Nunitz, *et al.*). This can be attributed to the residual impact of the objectivist
understanding of science and a stubborn allegiance to the "double language
thesis" which claims that there is a clear distinction between literal and
metaphorical language and that the latter can be reduced to the former either
by substitution or by means of comparison.

Postman speaks about "... our language habits are at the core of how we
imagine the world" (Postman, 1996:176) and states that metaphor provides
access to a discipline's assumptions about the way the world is structured.
He expresses his amazement at the fact that those who write about education
do not pay much attention to the role of metaphor in the understanding of the
subject. He says a student cannot understand a subject without paying some
attention to the metaphors at the foundation of the subject. In not doing this
teachers deprive the student of the opportunity to confront the basic assump-
tions of the theories in his subject. He urges teachers that the study of these
elements be given the highest priority in school. World making through
language is the story of how we make the world known to ourselves and how
we make ourselves known to the world. What we do or don't believe comes to
expression in our language. These beliefs reflect a community's habitual way
of talking about reality. Unfortunately, Postman laments, the ways in which
language creates a world view are often not a conscious part of the process of
schooling (1996:177). He cites a number of reasons for this:

1.   In the education of teachers, this topic is not introduced.
2.   It is generally believed that the subject is too complex for schoolchildren
     to understand.
3.   Metaphor is usually dealt with in language courses and predominantly
     addressed in poetry or formal grammar. The study of language as a world
     maker is inescapably of an interdisciplinary nature, so that teachers often
     do not know which subject should undertake it.

Postman proposes that in every subject — from history to biology to mathe-
matics — students be taught, explicitly and systematically, the universe of

discourse that comprises the subject. Each teacher would deal with the structure of questions, the process of definition, and the role of metaphor as these matters are relevant to his or her particular subject (1996:186). This also provides a great opportunity to show the way these definitions, questions and metaphors were formulated in the past and that there are currently also different views on these matters. This is an important argument for the inclusion of the history of the discipline in the process of education. Publications dealing with the history of "forces" and "fields" or atom theories provide ample examples of how important the study of the historical transformation and displacement of meaning of terms are in the history of physics. An important reason why this approach is not well received is the fact that many teachers still adhere to a positivist and objectivist understanding of their field. They also assume that these philosophical assumptions are either not present or dealing with metaphysical or world view assumptions delays the process of transfer of "factual" knowledge. Conceded, the focus on metaphor, definition and question may appear to be abstract, but he says: "Abstracting is the continuous activity of selecting, omitting, and organizing the details of reality so that we experience the world as patterned and coherent" (Postman, 1996: 179). An abstraction "... is a kind of summary of what the world is like, a generalization about its structure", Postman (1996:181) says. So when students are confronted with the basic metaphors of theories concerning wealth or the market, or health or normality, they are able to also identify alternative ways of thinking about these matters and above all critical alternative ways of thinking. Critique will be embedded in alternative views of the world that claim to do a better job at "... cutting the world at its joints" (Boyd, 1993). Alternative ways of thinking and knowing — articulated in new conceptual schemes — obviously require alternative ways of approaching teaching and learning.

An important issue remains to be addressed and that is the question concerning categorization that builds on the issue of "aptness" or "fittingness" mentioned earlier. It points to the need for the development of an integrated world view or philosophy which assigns normative anthropological, cognitive and educational itineraries according to which teaching and learning ought to take place. This would entail some systematic categorization of metaphors which does justice to the structural stratification of humankind and reality.

Notes

1.   An abbreviated version of this paper was presented at the *III International Conference on Metaphor in Language and Thought*. Universidade Estadual do Ceará, 21 (24de outubro de 2008).

2.   This list is randomly chosen from a number of lists available in the literature. *Cf.* Saban, 2006. Functions of Metaphor in Teaching and Teacher Education: A Review Essay, *Teaching Education*, 17:299-315, and Cook-Sather, 2003. Movements of Mind: The Matrix, and Re-imagining Education, *Teachers College Record*, 105:946-977.

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