

## World Hypotheses and their Relevance to Curriculum

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This paper provides a sketch of the areas in which Pepper's work is potentially useful to the field of curriculum. *World Hypotheses* has been used as an aid to interpreting different factions with regard to educational research methodology. This work has been used to address the broad question of the kinds of "world views" projected to students by the curriculum. It has been used to address specific issues concerning the curriculum (e.g., creation/evolution). Further, it has potential to serve as a background and a guide for curriculum development. In the area of teaching, *World Hypotheses* has been useful (as the object of what is taught) in graduate instruction in curriculum. Recent developments suggest that it has potential for informing us about the relationship between the structure of the subject-matter and pedagogical moves made by the teacher.

These brief remarks concern the relevance of Pepper's *World Hypotheses* (1942) to the field of education in general and, more specifically, with regard to work in the field of curriculum. In part, the function of these comments is to serve as a backdrop for viewing the following paper by Art Geddis. While my specific examples will relate only to work in the Department of Curriculum at The Ontario Institute for Studies in Education, I intend to provide a rough structure for seeing the relevance of Pepper's work to several aspects of the educational enterprise.

It will be helpful to make some general comments about the field of curriculum itself in order to explain why Pepper's work has intuitive relevance to those who are familiar with it. Curriculum, as an academic field, concerns research and reflection on schooling. Most research questions concerning the what, why, and how of teaching fall within the purview of curriculum and address one or more educational commonplaces: teacher, learner, subject-matter, and milieu. The current evolution/creation controversy, for instance, is an issue which has its roots in conceptions of the *subject-matter*, and largely concerns *what* should be taught in public schools.

The field of curriculum is normative and practical. Research is usually oriented toward and shaped by a view of what should be done in the practice of educating people. Its generalist quality is reflected in the fact that its supporting, or foundation, disciplines are conventionally seen as drawing from the social sciences—for example, psychology, sociology, philosophy, and

cultural anthropology. Each of these disciplines in turn has its own factions, paradigms of research, and so on. Various "sub-fields" within curriculum have grown from the disciplines as they are reflected in schools. Hence there is English education, science education, social studies education, and the like. Still other "sub-fields" within curriculum arise from methodological preoccupations (e.g., curriculum evaluation) or other foci (e.g., early childhood education). All of these considerations represent choices for the worker in this field.

The upshot of this is a literature which is complex and frequently confusing. The (usually) implicit assumptions of any single piece of the literature reflect a few of the enormous number of permutations which can be generated by emphasizing some choices over others. The irony of course is that while the field of curriculum is appropriately generalist in spirit, it is fragmented in practice. To see where different curricular analyses and prescriptions are located on the "map" of curriculum activity can be a formidable task.

If this sets the context accurately, then it is easy to see the intuitive appeal of Pepper's work. At one level it provides a heuristic structure which contributes to an understanding of the metaphysical and epistemological assumptions of curricular arguments. In reading Pepper's work one comes to appreciate the extent to which the world views (and their eclectic combinations) permeate the individual and indeed, constitute his/her intellectual essence. Pepper's work helps enormously in understanding the psychological/philosophical strength of intellectual positions—including those which outrun evidence and argument. Three simplified examples of educational illumination are: the "back to basics" movement is driven in part by formism; the "teach by behavioral objectives" movement is generated by a mechanistic conception of humankind; the "teach the whole child" movement is inherently contextualist.

At another level, the curriculum worker can see in Pepper's work the potential for the kind of intellectual integration which is lacking in the field itself as well as the potential for an intellectually integrated curriculum for students in schools. These are exciting potentials.

### **Meta-Research**

From this brief discussion of the intuitive relevance and appeal of Pepper's work let me turn to some concrete examples of the use of his work in an educational setting. One domain of application concerns meta-research—that is, research which comments on either the substance or methodology of research in a field itself. For example, at the present time the educational research community is in the throws of a methodological shift from research which represents a "scientific," experimental, quantitative orientation to that which represents an "ethnographic," holistic, qualitative orientation. Within

the subfield of science education there has been considerable resistance to this shift, largely because of the tendency of science educators to identify with research paradigms of the physical sciences. It is not surprising, then, to find some who try to make the case for the legitimacy of qualitative research in science education—and here Pepper's work has been valuable. Roberts (1982) has used Pepper's categories with considerable effect in dealing with this meta-research issue and it is illustrative to quote the abstract from his paper entitled "The Place of Qualitative Research in Science Education":

This article develops a way to conceptualize the complementarity of quantitative and qualitative research in science education. The differing sets of metaphysical presuppositions that give rise to the two approaches are systematically examined by using Stephen Pepper's "world hypothesis": it is argued and demonstrated that quantitative research is formist/mechanist in its metaphysical preoccupation, while qualitative research is contextualist/organist. The vehicle for demonstrating how these metaphysical systems actually influence science education research is Stephen Toulmin's "argument pattern." It is demonstrated through analysis of examples that quantitative and qualitative research reports follow the same pattern of argument, even though the metaphysical roots behind the approaches, which control their differing methodologies and other features, are obviously different. Given the emergence of qualitative research styles, implications are explored for the development of science education research as a total enterprise. Special attention is paid to the problems of appraising the quality of qualitative research reports and to the need for a comprehensive view of what constitutes legitimate research in science education. (p. 277)

### Curriculum Research

While there is potential for using Pepper's work in a variety of educational research settings, his work is not well known to the bulk of the educational research community. One line of research is represented by Kilbourn (1974). Kilbourn used the categories of the world hypotheses as the basis for developing a framework for detecting world views projected to students in curriculum materials. Although the research was a case study analysis of a high school biology text it was motivated by a general concern for the kinds of messages implicitly being taught young people about the nature of reality. Later this work was continued by a discussion of the use of Pepper's categories for research into the relationship between the curriculum and social issues; and here again it is illustrative to quote from the beginning of Kilbourn's (1980-81) paper:

This exploratory paper addresses the question of the kind of inquiry needed in curriculum for examining the relationship between broad social concerns and schooling. The concept of "world view" is developed as a heuristic device for generating inquiry into the role that the curriculum might play in contributing to social problems. An assumption is that the nature of the curriculum might contribute to the development of belief systems which, when acted on by individuals and institutions, have long-term detrimental consequences for society. The brunt of the paper lies in formulating a conceptual framework which can be used as a foundation for examining various aspects of this assumption. (p. 1)

The conceptual framework referred to in this quote has its origins in Pepper's world hypotheses. In a related article, Kilbourn (1980) addressed

the potential of the science curriculum for contributing to a student's conception of the nature of reality in a philosophical sense. More specifically, it is argued that, if the view of reality implicitly portrayed in the science classroom is a mechanistic one, it has potential longterm consequences for students and for society as a whole. The argument concludes by briefly outlining the implications for science education of this aspect of the hidden curriculum. (p. 35)

In this case the attributes of mechanism are articulated with the aid of Pepper's categories. In a more recent paper Anderson and Kilbourn (in press) use Pepper's distinction between the four relatively adequate world hypotheses, and those not entailing a concept of evidence, in order to shed light on the creation/evolution controversy currently being waged in public education. In particular, the correspondence between the categories of animism and the beliefs of creationists is used to argue against their claim that special creation can be considered a scientific theory.

It should be noted that with both "meta-research" and "curriculum research" the relevance of Pepper's work is its use as a heuristic device. In all of the examples above, his categories are used to further understand and make sense of a variety of educational phenomena.

### Teaching

Although to this point I have been discussing the use of Pepper's work in educational research, it is important to point out that his world hypotheses also have more immediate relevance to the what and how of teaching. The direct application of his work occurs when the world hypotheses themselves become the object of teaching. For example, in my graduate course entitled "Knowing and Teaching" Pepper's *World Hypotheses* (1942) is used along with Phenix's *Realms of Meaning* (1964). Phenix constructs six distinct ways by which humans have conceived, interpreted, and given meaning to experience: symbolics, empirics, aesthetics, synnoetics, ethics, and synoptics. Each of these realms in turn can be interpreted from a formist, mechanist, contextualist, or organicist perspective. *The Basis of Criticism in the Arts* (1945), of course, is Pepper's systematic treatment of the aesthetic realm according to the four world hypotheses. The application of world hypotheses to realms of meaning provides for a broad understanding of the intellectual basis for most of the subject-matter in the traditional secondary-school curriculum. It also provides a strong background for exploring the development of an integrated curriculum in which epistemology and metaphysics provide the basis for integration.

The kind of application just described concerns *what* is taught. On the one

hand, Pepper's work itself is what is taught and, on the other hand, his work can be used as the foundation or intellectual background for guiding the development of curriculum materials and for guiding the structure of the curriculum in its broadest sense (Quina, 1971). However, Pepper's work also has considerable potential for addressing issues of *how* we teach and the relationship between what and how we teach. This is the topic of the following paper by Geddis. Geddis shows the essential link between evidence and teaching and explores how different interpretations of evidence can shape what the teacher does in the classroom.

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