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ABSTRACT

This paper identifies the general shifts in curriculum research from the mid-1970s to the mid-1980s. Information is drawn from periodic reviews or summaries of the research literature. A comparatively larger number and variety of individual studies have been reported, but places to publish state-of-the-art curriculum reviews have become more scarce. Because of these factors, specialized and fragmented reviews have replaced systematic, comprehensive ones. Curriculum scholars have turned from positivistic inquiry to a range of newer forms of inquiry in a climate of uncertainty and defensiveness. Less attention has been paid to what needs to be studied in the curriculum field. Researchers' conception of curriculum has changed. Curriculum is no longer thought of as a deductive science but as a practical art. Recent curriculum research has become more aligned with this new conception. Two earlier papers by the author on this topic are appended. "Curriculum Knowledge: Kinds and Processes" (1974) discusses four types of knowledge generated by properly conducted curriculum research: disciplinary; conjunctive; technological; and practical. "Another Look at Curriculum Knowledge" (1984) contains the author's positive and negative reactions to his 1974 paper. (JAZ)

CURRICULUM RESEARCH IN RETROSPECT

by

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Paper presented to the Society for the Study of Curriculum History,
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In the years prior to the founding of the Society for the Study of Curriculum History in 1977, it was not common practice in the field of curriculum research to take stock periodically of where curriculum research was in its development, where it was heading, or whether it was going in worthwhile directions. In fact, curriculum research was less a self-conscious field of study than it was a domain of isolated attempts to deal with particular questions of interest to individual scholars. In a 1973 article, I made reference to this circumstance when I stated, "There is clearly a need for the field of curriculum [research] to study both quantitatively and qualitatively its own research productivity and to provide social policy makers [and practitioners] with an accurate picture of its needs and accomplishments" (Short, 1973, p. 247).

In a 1974 talk to Professors of Curriculum in Anaheim, I alluded to the need in the field of curriculum research for clarification of "the nature of the field of curriculum itself--gaining a definition of its boundaries, its subject matter, its major domains of inquiry, its more telling questions and pertinent problems, its key concepts, its generative ideas, and its conceptual systems" (Short, 1974, p. 18).

Mauritz Johnson observed in 1976 that "at the current rate at which we are pursuing genuine curriculum research, our great-grand children in our tricentennial year [of 2076] will know little more [than we do] about matters of curriculum." He gave a challenging appraisal of the field when he added, "Even some of the brighest of the younger curriculum scholars, though presumably better grounded in research

methodology, seem to be attracted more to curricular missionary work than to painstaking, rational scholarship on fundamental curriculum questions" (Johnson, 1976, pp. 506-507.

The AERA Special Interest Group that was formed in the 1970s to begin to address the relationship between curriculum research and curriculum practice (SIG on Creation and Utilization of Curriculum Knowledge) has not undertaken to prepare a status report on where we are in addressing that relationship. It has never prepared a summary of what has been accomplished in that regard nor proposed an agenda of future research that needs to be pursued in that area. While individual members of the SIG have made a number of significant contributions to the field of curriculum research, the SIG itself has not attempted any systematic analysis of the problem it was formed to address and remains today relatively indifferent to questions of whether the curriculum research field is going in worthwhile directions or not (Short, et al., 1985, pp. 18-20).

It was about the time of the appearance on the curriculum research scene of the Society for the Study of Curriculum History in 1977 that something of a historical consciousness began to develop among curriculum researchers. (I won't claim that there was any cause-effect relationship involved in this.) This historical consciousness allowed these scholars to ask questions about their collective work that had not been asked before. Bellack and Kliebard opened their 1977 volume of readings, Curriculum and Evaluation, with a section on "How Should Curriculum Problems Be Studied?" and made this introductory statement, "This [section] is, in one sense, a reflection of the continuing dialogue that must exist in any field as to its domain, its heritage, and its ways of attacking problems" (Bellack and Kliebard, 1977, p. 1). Some dialogue was beginning on this subject. Walker soon afterward noted the following:

> "The past few years have seen the publication of an unprecedented number of works inquiring into the nature and fate of the curriculum field itself.... This period of introspection has not yielded a consensus of opinion...about the nature of the field or the nature of inquiries proper to it...[but this] does not imply that nothing of value has been achieved in these writings (Walker, 1977, pp. 299; 302.

Indeed, from the vantage point of 1987, the shape of the curriculum research field looks as though a great deal has been accomplished in the last ten years. It has taken on configurations that could not have been foreseen in the early 1970s and ones that were certainly not projected by any carefully managed collective plan of action. Still, I think we can say in retrospect that curriculum researchers are reasonably satisfied with the developments that have occurred and with the directions that have been taken.

The Strategy and Aims of This Paper

In getting a picture of trends in curriculum research, I have drawn upon the several periodic reviews or summaries of the research literature that have been published over the last ten years rather than upon first-hand analysis of the individual curriculum studies to which they refer, although I am not unfamiliar with most of the citations given in these summaries or reviews. [You have a list of these sources so that you may recognize the confines of my research.] I do not intend to present a systematic review or critique of the actual contents or conclusions contained in these summaries or reviews; my time and purpose here do not permit

this. But I will attempt to identify ways in which curriculum research has shifted during this period, make some observations about how the field as a whole sees its work at the present time as compared with a decade ago, and indicate the current situation in the field of curriculum research with respect to certain perennial problems of inquiry faced in any field of study.[1]

General Shifts Noted from Mid-1970s to Mid-1980s

The first thing to be observed is the expansion of the number of individual studies reported and cited in these summaries. Much more published material has appeared in both article and book form, and much more unpublished work has been cited as well. In addition, an impressive variety of types of research has been undertaken, including empirical work of the descriptive and the comparative type to be sure, but an increasing amount of work using historical, enthnographic, humanistic/artistic, interpretive, critical, and other forms of inquiry (Schubert, 1982; Jenkins, 1985).

Partly because of this proliferation of curriculum research reports, the effort to summarize and review the existing studies in the field has become less systematic and more sporadic. Indeed, the state-of-the-art reviews of curriculum research that have appeared in this past decade are fragmented and limited in focus rather than comprehensive and synoptic. The last attempt to review the entire field of curriculum research in a single article of publishable length was made by Decker Walker in 1976 in his review entitled, "Toward Comprehension of Curriculum Realities" (Walker, 1977), and even here Walker admitted he had to slight some of the relevant studies. Other more recent attempts to deal with the field as a whole (Schubert, 1982; Jenkins, 1985) have been even more frustrated in their effort to be thorough and synoptic because they were obliged to cover very long spans of time,

as encyclopedia entries must necessarily do. It took a full-length book (Schubert, 1986) to cover the range and variety of curriculum research adequately. Even so, this was done in the context of portraying curriculum as a field of practice and knowledge rather than merely summarizing available research at a given point in time.

What has also contributed to the dilemma of presenting periodic systematic state-of-art-reviews of curriculum research is not only the expanded number and variety of studies being done but also the drying-up of available places to publish such reviews under the control of scholars in the curriculum field. AERA no longer devotes regular attention to curriculum syntheses or reviews, as it once did in RER. While its editors receive and publish such work when submitted, there is no assurance that the field will be covered adequately or often enough because no attempt is made to commission such work on a regular basis. There is one exception. It does so in its Encyclopedia of Educational Research, which is published every ten years or so, but then so much ground has to be covered in so few pages that this effort cannot compensate for the absence of a full range of intervening reviews or summaries.

What has developed in place of truly systematic, comprehensive reviews is an array of specialized and fragmented work that appears in a variety of publications on a very irregular basis. Some domains of the field do not receive continuing attention; some seem to be entirely overlooked, e.g., historical work and empirical work. This was not true a decade or so ago, and the current situation poses special new problems for organizing and managing this facet of the work of the curriculum research field. It is a shift that has occurred almost without being noticed and one which the curriculum historian who attends to the status of curriculum research must bring to light for the sake of the field as a whole.

I turn now to another shift that concerns the general welfare of the curriculum research field, one that is due in part to the growth and specialization that

increasingly characterize the field, but one that has been affected by some other developments as well. This is the tendency for curriculum scholarship to coalesce around each new method that has gained legitimacy, sometimes around particular interpretations of a method. The shift from positivistic to a whole range of newer (at least to curriculum researchers) forms of inquiry has occurred in a climate of uncertainty and defensiveness where acceptance has often been problematic. It is understandable why individual researchers would band together in mutual support behind new approaches and behind leading scholars using those approaches, given this climate. But the net result of this situation in many cases has been to work, publish, and discuss curriculum research in isolated enclaves somewhat protected from the interaction with tough critics of an approach or of its use in a particular study. While this isolationist tendency has gradually softened as time has passed (interactions and mutual criticism is, admittedly, more frequent now than they were in the mid-1970s), there still remains what might be called a kind of irrational allegiance on the part of some persons to a particular method or a particular interpretation of a method long after a need to sharpen or to modify or to abandon the method has become clear to others. What at first may look like a promising approach to curriculum research may lose its potential for useful inquiry if it is not objectively appraised. There has been a tendency for persons to be apostles for a particular form of inquiry without regard to telling criticism or the utility of the research results. Here, then, is a problem that rapid advancement of curriculum research has produced and one that needs to be addressed once again.

Contributing to this state of affairs has been a drop in attention being paid over the last decade to the matter of what needs to be studied in the curriculum field and how to conceptualize the problems needing attention. Walker in 1977 summarized a whole series of studies aimed at addressing these matters, while recent reviews (Jenkins, 1985; Short, 1985) reveal very little work being done in this

vein. Research topics common in 1977 (McNiel, 1977) had to do with curriculum purposes selection and organizing content, curriculum evaluation and change, and how to study curriculum. Walker (1977) organized the studies he reviewed around these topics: relation of curriculum variables to achievement, maintenance and change in response to social forces, the change process in school and classrooms, and studies of the curriculum field itself. Similar commonplaces, studied within an ecological framework, have become foci for recent research, except that the examination and conceptualizations of the field as a whole has given way to what is known as "curriculum theory" (Benham, 1981; McCutcheon, 1982, Schubert, et al., 1984). Debates persist about what curriculum theory is, what function it performs, how to generate it (in a variety of forms and languages), and what it should address. (See Vallance article, "The Practical Uses of Curriculum Theory," in McCutcheon, 1982. See also Schubert, 1980.) Nevertheless, without some practical conceptual work on what curriculum is or could be and what the elements are on which we need theory and research, theorizing and new forms of inquiry can easily become objects of devotion in and of themselves. There is some evidence from the last decade that some curriculum scholars have fallen prey to this tendency. Creative studies of the field of curriculum as a focus of intellectual inquiry are clearly not as prevalent today as they were in decades past.

One major contribution to rethinking curriculum and its associated conceptual problems has emerged since the mid-1970s, however. It has come into view rather gradually but it has affected the kind of research being done in the field quite radically. Because our conception of curriculum has changed, the kind of curriculum research has necessarily shifted.

We no longer think of curriculum as a deductive science in which curriculum decisions result from some linear means-end thought process. We no longer expect such decisions to follow logically from certain scientifically determined premises or

theories, nor do we expect them to be derived from reasoning backward from some predetermined goal or aim to certain technologically tested or proven prescriptions. Rather, we have come to think of curriculum as a practical art in which both ends and means must be negotiated through arguments involving practical judgment and practical reasoning. That is to say, all curriculum decisions, whether policy-oriented ones or ones related to program development, design, and enactment, are essentially moral and political rather than technical and deductive in type, and the arts of deliberation are at the core of this kind of thinking and decision-making.

A strong hint of this shift in our conception of curriculum appeared in Walker's review in 1977. The case for this new conception of curriculum was compellingly and convincingly presented by William Reid in his 1978 book (chapter four), based on the earlier work of Schwab, Walker, and others. Jenkins review of 1985 made clear that that this shift has persisted and has affected subsequent curriculum research. He says, "Curriculum is a practical art rather than a theoretic art, typically concerned with defensible judgments rather than warrantable conclusions" (Jenkins, 1985, p. 1257). The consequence of this view is that curriculum research has come more and more to be aligned with this new conception of curriculum. Reid explained this necessary shift by saying,

> "Curriculum research...should...cultivate approaches other than the scientific to the creation of curriculum knowledge: for the kinds of knowledge required to assist in the performance of curriculum tasks are the kinds that are relevant to public policy-making. Not statements of lawful relationship which might tend to devalue the role of responsible judgment, but data that help us identify and define problems for decision and that increase our capacity for generating alternative solutions and for

improving the quality of our deliberations about which of these should be adopted" (Reid, 1978, p. 27).

Now, this shift in our conception of curriculum has had all sorts of impacts on the way we do curriculum research and inquiry. For instance, the reviews of research on curriculum and political or economic ideology (Apple, 1979; Giroux, 1979; Boyd, 1979; Schubert, 1982; Jenkins, 1985; Beyer, 1986) clearly reflect that work of this kind assumes a conception of curriculum and of the curriculum decision-making process that embraces judgment and value, deliberation and power. The critical form of inquiry associated with these kinds of studies could not proceed under a highly rationalistic or technical conception of curriculum. Indeed, where empirical work turns up this sort of conception, critical inquiries can be expected to try to reveal the ethical and political contradictions inherent in this concept as well as other kinds of contradictions operating in such settings.

The humanistic and artistic forms of curriculum research (Pinar, 1978; Eisner, 1978; van Manen, 1978; Benham, 1980; McCutcheon, 1982 (b); Schubert, 1982; Jenkins, 1985; Beyer, 1986; Pinar, 1987) also presuppose a conception of curriculum wherein the results of these qualitative types of inquiry may influence values and expectations of various parties to curriculum decision--pupils, teachers, administrators, planners, and the public. If there is no possibility of the various human agents to the decisions being able to present and argue their particular viewpoints, adjudicating their differences through reasoned and judicious procedures, and legitimating their joint decisions, there would be little point in doing most of the humanistic and artistic forms of research. Narrative portrayals, educational criticism, naturalistic and ethnography studies, and interpretative, autobiographical, psychodramatic work--all these have been used and have flourished in a decade when curriculum planning is no longer thought of as the province of a single expert or a small set of authorities who "know" how best to construct curriculum.

Even historical research in curriculum has taken on the flavor of the critical and the humanistic scholars (Tanner, 1982; Kliebard and Franklin, 1983; Schubert, 1986) while embracing the search for school curriculum policies and practices, not just the records of curriculum ideas. Empirical research has taken on naturalistic and ethnographic approaches (Walker, 1977; McNeil, 1978; Eisner, 1978; Schubert, 1980; Kliebard and Franklin, 1983; Jenkins, 1985; Schubert, 1986) rather than searching for law-like propositions or theories (Reid, 1978; Walker in McCutcheon, 1982; Jenkins, 1985; Schubert, 1986).

Whether this dynamic conception of curriculum-making as practical judgement and reasoning will persist and be sustained under future scrutiny and use is, of course, impossible for a curriculum historian to say. But, it is quite possible to say that the greatly expanded and varied research efforts in the field of curriculum over the last decade have been energized by a conceptual breakthrough of considerable proportions in the form of this new normative conception of curriculum. It remains for those intimately associated with this important intellectual shift to articulate for future historians exactly what has changed from the old view to the new.

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[1]In this retrospective account I draw heavily upon two papers of my own, written a decade apart (Short, 1974; Short, 1984), which were state-of-the-art reviews of curriculum research in 1974 and 1984 respectively. Because I cannot deal in this brief paper with all of the important topics addressed in those reviews and because they provide certain documentation for assertions made and inferences drawn herein, those previously unpublished papers are appended to this paper in order to provide full reference to sources and clear bases for many of the statements made in this paper. (See Appendix A for the 1974 paper and Appendix B for the 1984 paper.)

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Appendix A

CURRICULUM KNOWLEDGE: KINDS AND PROCESSES*

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This article reports the results of a conceptual analysis of the kinds of research that are possible in the field of curriculum. Conceptual distinctions are drawn among types of knowledge that can be generated by valid knowledge-producing methods in any type of research and are applied to the field of curriculum. Clarification of these distinctions, together with examples of them, are presented in this article in order to suggest their utility for improving the conduct of research in the field of curriculum. The analysis draws upon a study of knowledge production in general and of the inquiry approaches related to various kinds of knowledge production, which is reported in a recent article in the Review of Educational Research.[1]

Four distinct types of knowledge can be produced as outcomes of properly conducted research. The four types may be labeled as follows: disciplinary knowledge; conjunctive knowledge; technological knowledge; and practical knowledge. These four are as applicable to curriculum research as to any applied field of study. Curriculum knowledge, therefore, may be produced in four distinguishable forms, six if we identify some subdivisions of these four. It is also possible in principle to identify unique methods of inquiry appropriate to each of these types of knowledge production. Thus, in curriculum, it should be possible to

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* This article is an extension of a paper presented to the Professors of Curriculum, March 9, 1974, Anaheim, California.

[1] Edmund C. Short, "Knowledge Production and Utilization in Curriculum: A Special Case of the General Phenomenon," Review of Educational Research, 43 (Summer, 1973), 237-301. For a condensation of this article, see Mental Health Digest, 5 (November, 1973), 7-15.

formulate inquiry approaches that can be utilized in creating curriculum knowledge of each of these four types.

These categories represent, to put the matter differently, various types of research goals. It is important to note that anyone carrying out inquiry, with the purpose of establishing valid knowledge, must know before he starts which category of knowledge he is seeking to create. The results of research are not all of the same order. A particular kind of inquiry can lead only to a particular type of knowledge. Thus, the ability to distinguish what type of knowledge one aims to produce is a prerequisite for determining what questions to ask, what methods to use, what criteria for acceptance of knowledge claims are appropriate, and the like.

A few examples will give some preliminary indication of the differences among these categories of knowledge. An illustration of disciplinary knowledge might be the historical work produced by Herbert Kliebard, indicating particular ideas that occurred in the history of curriculum as the result of particular actions or influences of individuals or groups in the society at large.[2] This research employs the methods of historiography. One may also recall a study by Hilda Grobman, entitled, Developmental Curriculum Projects: Decisions Points and Processes, (Peacock, 1970). Here, conclusions were generated about what socio-political factors were operating in a number of the national curriculum developmental projects of the 1950's and 1960's. Many other studies could be cited as examples of studies that yield disciplinary knowledge. Since disciplinary knowledge is relatively familiar to most researches, perhaps no other examples need be given. These types of studies are essentially descriptive

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[2]Herbert M. Kliebard, "The Field of Curriculum in Retrospect." In P.W.F. Witt (Ed.), Technology and the Curriculum. New York: Teachers College Press, 1968. Pp. 69-84; "Bureaucracy and Curriculum Theory." In Vernon F. Haubrich (Ed.), Freedom, Bureaucracy, and Schooling, 1971 ASCD Yearbook. Washington, D.C.: Association for Supervision and Curriculum Development, 1971. Pp. 84-101.

and result from asking particular sorts of questions capable of being handled by the research approaches of particular disciplines, historial, political, sociological, philosophical, psychological, and so forth.

In contrast, conjunctive knowledge is the result of attempting to conceptualize the nature of some whole (defined in a situational, reality context) rather than the result of limiting the data, the perspective, or the phenomena to be studied (as in the case of disciplinary inquiry) to that which is amenable to the tools of the particular discipline one chooses to utilize. These wholes are messy phenomena, where one seeks to understand the realm of activity in all its dimensions. For example, conceptualizations of the phenomena we call curriculum have appeared in numerous forms, from Ralph Tyler, John Goodlad, James Macdonald, Mauritz Johnson, and others. In the conjunctive domain referred to as moral education, an attempt was made in 1968 to delineate the nature of moral education at a conference sponsored by the Ontario Institute for Studies of Education.[3] Another instance of a conjunctive study is one published in 1971 which describes and analyzes the decline in pupils' valuing of their public school experience from many different perspectives.[4] Note that in all of these conjunctive studies, the statements, theories, or knowledge being sought required drawing upon knowledge of a disciplinary sort, from many diverse disciplines, in fact. In addition, this kind of inquiry must account for a circumstance or an activity in its undifferentiated state in such a way as to make its overall nature intelligible to us.

A third type of knowledge, technological knowledge, is the kind sought when someone like Robert Stake or Joel Weiss prepares and tests a technology for

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[3]Clive Beck, Brian Crittenden, and Edmund Sullivan (Eds.), Moral Education: Interdisciplinary Approaches. Toronto: University of Toronto Press, 1971.

[4]Vernon F. Haubrich (Ed.), Freedom, Bureaucracy, and Schooling. 1971 ASCD Yearbook, Washington, D.C.: Association for Supervision and Curriculum Development, 1971.

conducting general program evaluation. Or when someone like the CEMREL staff creates a set of rules by which programs in aesthetic education can be designed.[5] Or when someone like Marcella Lawler generates a set of twenty-one tested guidelines for introducing planned curricular innovation into a school system.[6] These research and development efforts aimed at producing technological knowledge have a particular desired practical goal in mind and, together with whatever pertinent conjunctive knowledge may be available, conceive and test out a set of processes, procedures, or guidelines that will achieve the stated goal in the given kind of circumstance.

Finally, the creation of practical knowledge, the fourth type, is internal to each individual who produces it. The methods of producing it are uniquely individual and, therefore, cannot be extracted and generalized for use by others. This fact can be detected by observing an exceptionally talented and experienced curriculum worker, for instance, who is recognized as making judgments and taking actions that are eminently appropriate and successful. Such a person is in possession of considerable practical knowledge which is uniquely his own and which makes possible consistently wise performance. This type of knowledge is a result of a person's unique accummulation of experience and an excellent command of a variety of appropriate technologies for accomplishing goals for which he is responsible. No doubt, as well, he has a wide repertoire of accurate conceptualizations of conjunctive and disciplinary domains of knowledge upon which he can draw when he needs to create practical courses of action for which tested technologies do not exist.

This individualistic, situational character of practical knowledge makes it

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[5] Manuel Barkan, et al., Guidelines: Curriculum Development for Aesthetic Education. St. Ann, Missouri: CEMREL, Inc., 1970.

[6] Marcella Lawler (Ed.), Strategies for Planned Curricular Innovation. New York: Teachers College Press, 1970. Pp. 13-47.

of more concern to the educator and trainer of practitioners than it is to the producer of knowledge, who views the matter from a research perspective. Since the chief interest in this article is with the creation of curriculum knowledge and with those valid communicable methods of inquiry which can be identified and learned by those seeking to conduct curriculum research, this fourth type of knowledge will not be stressed. Nevertheless, practical knowledge is of such importance that it cannot be ignored, even in the context of an analysis of research. To leave out an analysis of the fourth type of knowledge would leave unclear the value and use of the other three categories of knowledge produced, for it is in the forming of practical knowledge that all of the others reach their ultimate application. It should also be clear from this analysis why so many persons who are at the point of having to make judicious practical judgments are handicapped if they have not incorporated knowledge of the first three types into their own operational repertoire.[7]

Behind this analysis of the conceptual distinctions among four types of knowledge that can be produced lies the hope that curriculum researchers may recognize the significance of these different categories of research goals and be able to avoid confusing one with another. Curriculum researchers may at times be unclear about the type of knowledge they wish to produce and the methods of inquiry appropriate for generating that type of knowledge, and may, therefore,

[7] Whether it is proper to classify knowledge of this practical kind as knowledge at all is an interesting question. I have chosen to do so because I think it can be and should be validated; it is not a result of idiosyncratic perception. It is the one type, however, which cannot be made publicly generalizable; consequently, it is not possible to talk about how to teach someone the research methods appropriate to the generation of practical curriculum knowledge, at least in the same way it is possible to do so when the goal is the creation of disciplinary, conjunctive, or technological knowledge. In the interest of advancing the number and quality of persons who are able to produce valid curriculum knowledge, I shall limit the remaining analysis to those three types of knowledge production where we can know something about the inquiry processes involved that can be utilized by all persons attempting to create knowledge.

fail to conduct their studies in the fashion most likely to produce quality results. On the other hand, if they are able to classify what types of knowledge they are aiming to produce, they may be able to avoid wasting considerable time and energy in making, then correcting, some mistakes that often occur in carrying out research (for example, applying empirical methods of inquiry to a conjunctive problem, or working to synthesize disciplinary knowledge in an effort to generate technological knowledge). Conceptual clarification, such as is being set forth here, should be considerable value to the researcher in determining what exactly he is aiming to produce and what methods of inquiry are appropriate to the task.

Each of the first three types of knowledge and the inquiry processes related to each of them will now be taken up in some detail in the context of curriculum research.

Disciplinary Knowledge and Inquiry

The work of the researcher who utilizies the tools of the basic disciplines to produce new knowledge is relatively easy to distinguish. He may use any of the approaches to inquiry associated with historical, philosophical, political, economic, or sociological methods of research (among others) to produce a kind of knowledge which can be recognized as disciplinary knowledge. Historical studies in curriculum, such as Seguel's treatment of seven curriculum leaders in the field,[8] and Kliebard's studies of the relationship of social thought in the United States to developments of curriculum, are familiar examples. Philosophical works in curriculum include, for example, Broudy's analysis of educational objectives,[9] and Phenix' or Schwab's analyses of the relationship of the structure of the

[8] Mary Louise Seguel, The Curriculum Field: Its Formative Years. New York: Teachers College Press, 1966.

[9] Harry S. Broudy, "The Philosophical Foundations of Educational Objectives," Educational Theory, 20 (Winter, 1970), 3-21.

disciplines to the curriculum.[10] Examples might be cited which employ almost every kind of disciplinary model of inquiry in attacking a range of curricular research questions.

As curriculum researchers discover that many different kinds of disciplinary knowledge may be generated in the field of curriculum, their proficiency in understanding and employing disciplinary modes of inquiry must increase. The volume, Research for Tommorow's Schools: Disciplined Inquiry for Education,[11] attempt to acquaint the researcher with the importance of utilizing a broad range

isciplinary modes of inquiry in educational research. Illustrated in this book are methods of objective inquiry from the various disciplines, including philosophy, history, economics, political science, anthropology, and the humanities, as well as the more commonly employed methods (in education) of psychology and sociology. The intelligent use of any of these modes of inquiry requires an understanding of their sources in philosophy of science and in epistemology. Three recent surveys of these sources are now available to educational researchers. Gowin and Millman[12] indicate how the contexts of inquiry, the methods of work, the products of research, and value considerations differ among the several modes of disciplinary inquiry. They point out that there are unique phenomena of interest, certain telling questions, specific principles of evidence to be adhered to, particular key concepts, conceptual systems, and assumptions to be found within each discipline. Mastery of the use of any particular mode of inquiry must come from emersion in the traditions and applications

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[10] Philip H. Phenix, Realms of Meaning. McGraw-Hill, 1964; Joseph J. Schwab, "Structure of the Disciplines," pp. 6-30 in G. W. Ford and Louis Pugno, The Structure of Knowledge and the Curriculum. Chicago: Rand McNally, 1964.

[11] Lee J. Cronbach and Patrick Suppes (Eds.), Research for Tomorrow's Schools: Disciplined Inquiry for Education. New York: McMillan, 1969. See also the entire issue of Review of Educational Research, December, 1969.

[12] D. Bob Gowin and Jason Millman, "Research Methodology - A Point of View," Review of Educational Research, 39 (December, 1969), 553-560.

of that discipline. The seventy-first Yearbook of NSSE (Part I) and the 1973 AERA book of readings entitled, Philosophy of Educational Research, both give extensive treatment to the promises and pitfalls of the various approaches to disciplinary inquiry.[13] They also provide considerable insight into the epistemological bases and appropriate application of these modes of inquiry.

Northrup suggests that the inquiry process consists of three stages: first, the analysis of the problem; second, the natural history stage; and third, the stage of theory formulation.[14] In the first stage, according to Northrup, "the problematic situation must be reduced to the relevant factual situation (p. 30)." A specific question must be formulated which is capable of being answered through the determination of certain facts. The method of analysis, applied to the problem, is appropriate here. In the second stage, the facts are "immediately apprehended by observation, expressed in terms of concepts with carefully controlled denotative meanings by description, and systematized by classification (p. 35)." The natural history stage, consequently, is characterized by the Baconian inductive methods of observation, description, and classification and ends with described fact in the form of propositions. The stage of theory requires the use of previously observed factors to suggest hypotheses from which consequences may be deduced and checked. This involves the construction of a deductively formulated theoretical system of related concepts in which there are "epistemic correlations which join them to the objective entities and relations designated by concepts by postulation (p. 131)."

In the educational research literature, discussion of stage one, the

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[13] Lawrence G. Thomas (Ed.), Philosophical Redirection of Educational Research. Seventy-first Yearbook of the National Society for the Study of Education, Part I. Chicago: The University of Chicago Press, 1972; Harry S. Broudy, Robert H. Ennis, and Leonard I. Krimmerman (Eds.), Philosophy of Educational Research. New York: John Wiley and Sons, 1973.

[14] F. S. C. Northrup, The Logic of the Sciences and the Humanities. New York: Meridian Books, 1947.

analysis of the problem, is frequently given little space or technical guidance. In the literature of curriculum research, almost no authoritative guidance for this stage is to be found at present. For stage two, some general assistance is given by most texts on educational research, but the importance of the natural history stage is often not stressed nor are the methods of deriving facts clearly laid out. Recently Joesph Schwab has explicitly brought to the attention of curriculum researchers the importance of this natural history stage and has recommended that this level of inquiry be pursued vigorously in a field such as curriculum which is short on theoretical grounding.[15] The stage of theory formulation has been treated often, perhaps not comprehensively, in the educational research literature. Herrick and Tyler in 1950 and Beauchamp, more recently, have written on curriculum theory.[16] A number of others have also been giving attention to limited aspects of the nature of theory in curriculum.

In general, disciplinary inquiry in the curriculum field has had to depend upon the ability of individual researchers to locate and use authoritative knowledge about the application of disciplinary methods of inquiry to their own field rather than being able to rely upon standard systematic sources on curriculum research that have already drawn this information together for all to study and to learn to utilize.

Some studies that yield disciplinary knowledge are not simply the result of individual inquiries but are the result of taking the products of these individual studies and integrating them into some systematic or comprehensive synthesis. Inventories or critical reviews of disciplinary research are also to be found. Methods of producing integrative studies are of course different from those

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[15] Joseph J. Schwab, The Practical: A Language for Curriculum. Washington, D.C.: National Education Association, 1970.

[16] Virgil Herrick and Ralph Tyler (Eds.), Toward Improved Curriculum Theory. Chicago: University of Chicago, Press, 1950; George A. Bauchamp, Curriculum Theory, Second Edition. Wilmette, Illinois: Kagg Publishing Co., 1968.

employed in producing individual disciplinary studies, but the knowledge produced is clearly of the disciplinary sort. Examples of intregrative studies in education are numerous, the most familiar being those found in the issues of Review of Educational Research, in Encyclopedia of Educational Research articles, and in each Annual Review of Educational Research. Major textbooks also sometimes provide summaries of disciplinary knowledge on particular questions. Examples of syntheses of curriculum research findings that could be mentioned include the recent study by Kirst and Walker of curriculum policy-making using socio-political inquiry approaches and the review of historical studies in curriculum by Bellack.[17]

Conjunctive Knowledge and Inquiry

While disciplinary inquiry has long held an honorable place in the history of scholarly research, conjunctive inquiry has been more tenuous and suspect. This may be due in part to the less rigorously explicated methodologies of research associated with this form of inquiry. Then, too, it may be that the product of this kind of inquiry at first seems indistinguishable from the kind of knowledge generated by disciplinary methods. However, when examined closely, in terms of the kind of questions asked, the kind of inquiry approaches utilized, and the kind of knowledge yielded, conjunctive inquiry turns out to be quite different from disciplinary inquiry. Norman Storer, who has chosen to refer to education and similar fields of activity as conjunctive domains, has recognized that knowledge which accumulates discipline by discipline is not the kind of knowledge which is required if one is to understand the contours of a particular realm of practical

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[17] Michael W. Kirst and Decker F. Walker, "An Analysis of Curriculum Policy-Making," Review of Educational Research, 41 (December, 1971), 479-509; Arno A. Bellack, "History of Curriculum Thought and Practice," Review of Educational Research, 39 (June, 1969), 283-292.

activity.[18] Research directed toward producing knowledge of this latter kind brings together, or conjoins, studies related to a particular kind of action setting, or to some aspect of it, for the purpose of seeing accurately and in their entirety the "givens" upon which action has to be based. This kind of inquiry goes on all the time and deserves to be recognized as a distinct kind of scholarly research along with disciplinary (and technological and practical) forms of inquiry.

Conjunctive knowledge, such as that produced from the Beck or the Haubrich studies mentioned earlier, is the kind of knowledge which results from attempting to make intelligible a type of activity or real situation that occurs as an undifferentiated puzzle and which must be dealt with as a whole. One might attempt to deal with such a matter, by understanding its historical or philosophical dimensions, for example, but not its current empirical aspects; however, without full knowledge of the intertwining relationships among its several dimensions, one could fail to deal with the whole matter satisfactorily. The effort needs to be grounded in an adequate conceptualization of the whole.

In education, conjunctive knowledge is required about such problems as the nature and aims of education, curriculum design and validation, organization and policy, teaching and learning, and many others. Within the field of curriculum itself, conjunctive knowledge is needed with regard to the nature of curriculum per se, the role of objectives in curriculum development and implementation, the structural aspects of program design, curriculum evaluation, curriculum policy-making, and many other matters.

Conjunctive inquiry seeks a comprehensive conceptualization of the particular

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[18] Norman W. Storer, "The Organization and Differentiation of the Scientific Community: Basic Disciplines, Applied Research, and Conjunctive Domains," pp. 123-141 in Richard A. Dershimer (Ed.), The Educational Research Community: Its Communication and Social Structure. Washington, D.C.: American Educational Research Association, 1970. (ERIC: ED 057 275); See also Educational Researcher, 1 (3), (1972), 15-17.

type of problem situation being studied. Producing knowledge in the conjunctive domain is roughly a matter of investigating the variables operating in a problem situation, sorting out the relevance of appropriate knowledge from disciplinary studies, and in light of implications of this knowledge, drawing together and testing conceptualizations that accurately reflect or make intelligible a piece of the problem or the problem as a whole. The process is not merely one of relating all findings from disciplinary studies which focus upon the same question (as is the case in synthesizing or summarizing disciplinary knowledge), nor is it just a matter of seeing the relationships among the established generalizations within a discipline and producing structured (theoretical) knowledge consistent with them. Rather, conjunctive inquiry is a process of selecting and relating relevant findings from a number of separate disciplines which have a bearing on the several aspects of the practical situation being studied. Any of the disciplinary approaches to inquiry may be applied to a question or a series of questions within the larger conjunctive question, but of necessity it will always be doing so from its own disciplinary perspective. What is required in addition to this is for someone to integrate all such relevant work into an accurate picture of the total problem. Conjunctive inquiry is interdisciplinary, in the sense that the questions probed are not by their nature restricted to the use of but one of the modes of disciplinary inquiry. Perhaps the term "multidisciplinary" best describes this approach. The disciplinary knowledge which is brought together in a conjunctive domain will not be derived, however, from a multidisciplinary approach to a single question within the problem field, but to all of the pertinent questions that arise in an attempt to understand the conjunctive activity under study. This is essentially a task of "contiguous problem analysis" by various disciplinary methods as Dubin has pointed out.[19] Conjunctive research should not be thought of as the

[19] Robert Dubin, Theory Building. New York: The Free Press, 1969. Pp. 243-249.

application of some method that homogenizes two or more disciplinary modes of inquiry; while it may utilize the results of disciplinary inquires of various kinds, it employs a distinct mode of inquiry which has its own integrity and is integrative, rather than analytic, in character. The aim is to construct and validate some theoretical understanding of an entire human problem or activity. One difficulty associated with conjunctive inquiry seems to be the problem of testing the conceptualizations that are generated. Many are created but few are validated. Guidelines for the conduct of conjunctive inquiry in education are not commonly found among the handbooks on educational research. This omission is largely responsible for the low esteem in which conjunctive inquiry is held and for the low degree of defensible progress achieved by research efforts in practical fields such as curriculum. Further explication and clarification of the process of producing conjunctive knowledge is required before adequate guidelines can be communicated to researchers who wish to use them to engage successfully in conjunctive inquiry.

Technological Knowledge and Inquiry

Technological knowledge, the third type of knowledge to be analyzed in this article, results from inquiry which goes by the name of development. It is knowledge produced by people called "developers." It comes in two forms, one of which is referred to as general technological knowledge, and the other particular technological products. Technology, in either of these two knowledge forms, is not as familiar as technology in its hardware forms. Nevertheless, technological knowledge is perhaps the most frequently sought type of knowledge which can be produced by scholarly methods of educational inquiry.

Technology refers to a systematic body of facts and principles related to a practical end. Technological knowledge and products appear, according to Polanyi, as imperatives or conditional commands, declaring themselves, "in favor of a definite set of advantages," and telling people "what to do in order to secure them."

Technology "establishes a new operational principle serving some acknowledged advantage." The technologist "follows the intimation of a possibility of making things work in a new way for an acceptable purpose."[20] Nelson, et al., state that "the body of technological knowledge is a set of techniques, each defined as a set of actions and decision rules guiding their sequential application, that man has learned will generally lead to a predictable outcome under certain circumstances."[21] Each body of technological knowledge, therefore, pertains to certain specific problems and outcomes. There are many possible technological products that are capable of being derived from the same body of general technological knowledge. If that knowledge has stood the test of practice, and if the fabricating of specific procedures has adequately been performed in keeping with this technological knowledge, then any such technological products developed should be workable within the appropriate situations. Sound technological products, however, cannot be expected to attain the desired results without the experience of a skilled expert in carrying out the prescribed action. Knowledge of the specifics of the product alone does not necessarily mean the proper consequence will follow.

In the field of curriculum, the generation of bodies of technological knowledge has been extensive. Many of these technologies, however, are still being tested or remain untested. Curriculum technology falls into a number of different categories. The development of procedures for the evaluation of curricular programs is one kind of curriculum technology.[22] Louise Tyler, et al., have developed a

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[20] Michael Polanyi, Personal Knowledge: Towards a Post-Critical Philosophy. New York: Harper Torchbooks, 1964. Pp. 177-178.

[21] R. R. Nelson, M. J. Peck, and E. D. Kalachek, Technology, Economic Growth, and Public Policy. Washington, D.C.: The Brookings Institution, 1967. P. 8.

[22] Robert E. Stake, "Toward a Technology for the Evaluation of Educational Programs," pp. 1-12 in Ralph E. Tyler, Robert M. Gagne, and Michael Scriven, Perspectives of Curriculum Evaluation. Chicago: Rand McNally, 1967; Joel Weiss, Jack Edwards, and Olga Dimitri, Formative Curriculum Evaluation. Toronto: Ontario Institute for Studies in Education, n.d., (1972).

related technology of assessing or selecting curriculum materials.[23] There are many other kinds of curriculum technology that pertain to particular aspects of curriculum. Perhaps the chief kind of technology which is associated with the curriculum field is that which is concerned with the development of total programs. A number of general principles of curriculum design, for example, have been developed as a result of testing various designs in practical settings. Much of this kind of technology is provided in typical curriculum textbooks. The development of particular curricular programs from a general design technology is an example of the second form of technological knowledge production, the design of particular technological products. Other types of general curriculum technologies, such as those which deal with curriculum policy-making or decision-making, have been produced, and their derivative products suited to particular kinds of settings are familiar to anyone who has engage in this kind of activity guided by a set of knowledge-based (as opposed to ad hoc) principles of deliberation. Yet another important type of technology that is developed in the field of curriculum is technology of curriculum proposal-building. Curriculum proposals are alternative program models that may be considered for adoption in particular educational settings. Prior to their being considered, they must be created from combining some value position or assumptions with a technology of curriculum proposal-building. Such technology indicates how to go about building a curriculum proposal. This type of curriculum technology is at present rather poorly developed. Particular curriculum proposals utilizing this kind of general technology are somehwat more familiar than any general technology of

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23 Louise L. Tyler, M. F. Klein, and W. B. Michael, Recommendations for Curriculum Instruction Materials. Los Angles: Tyl Press, 1971.

proposal-building itself.[24]

The production of curriculum technology is wide-ranging but rather incomplete. Alternative technological products are frequently not available even when a reasonably sound volume of general technological knowledge is at hand. The poor quality of many existing specific products, however, would suggest that the general knowledge base from which they were derived may not have been adequate. Much work remains to be done, both in developing technologies and products of high quality in areas already under development, and in identifying categories of curriculum technology in which development work is urgently required.

Technological knowledge, whether in curriculum or in any other practical field, is produced by methods of inquiry especially suited to the development process. Development of technological knowledge in education or in curriculum is seldom described thoroughly in books on the conduct of educational inquiry. A few sources are particularly helpful. Guetzkow has defined the process of technological inquiry as having three phases: (1) the variables identified as relevant to the outcome being sought are selected from those that have been discovered by researchers in the pertinent problem area, (2) alternative theories involving these variables are composed, or a relevant one is selected if some are already available, and (3) the magnitudes of important constants are determined in order to make specific predictions. That is, developers must (1) consult conjunctive

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[24] Harry S. Broudy, B. O. Smith, J. R. Burnett. Democracy and Excellence in American Secondary Education. Chicago: Rand McNally, 1964; Philip H. Phenix, Realms of Meaning. New York: McGraw-Hill, 1964; Florence B. Stratemeyer, et al., Developing a Curriculum for Modern Living, Second Edition. New York: Bureau of Publications, Teachers College, Columbia University, 1957; B. O. Smith, et al., Fundamentals of Curriculum Development, Revised Edition. New York: Harcourt, Brace & World, 1957; Arthur J. King, Jr. and John A. Brownell, The Curriculum and the Disciplines of Knowledge. New York: John Wiley & Sons, 1966; Louise Berman, New Priorities in the Curriculum. Columbus, Ohio: Chas. E. Merril, 1968; Arthur Pearl, The Atrocity of Education. St. Louis: New Critics Press, 1972; D. E. Purpel and M. Balenger (Eds.), Curriculum and the Cultural Revolution. Berkeley: McCutchan, 1972; Jack R. Frymier, A School for Tomorrow. Berkeley: McCutchan, 1973.

knowledge, (2) invent a solution, and (3) test the effect of a given solution.[25]

Nadler has described a ten-stage process: (1) determining the functions to be fulfilled, (2) designing an idealized solution, (3) gathering information (4) noting wherein the idea is not feasible, (5) selecting an alternative feasible solution, (6) formulating details of the solution, (7) assessing the suitability of the solution, (8) testing it in real or artificial circumstances, (9) adjusting the solution to an "effectiveness" standard, and (10) establishing the features of the solution that permit its predictive value.[26]

In the field of education, Baker has outlined a six stage model for instructional product development which includes: formulation, specification, development, field testing, revision cycles, and implementation.[27] The process of technological development, as it is conceived and followed by the Educational Research and Development Laboratories, has been described in a recent volume by Hemphill and Rosenau.[28] The process of applying general technological knowledge to the development of particular technological products is a process more familiar in the various fields of natural science and technology than it is in the field of education or curriculum.

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[25] H. Guetzkow, "Conversion Barriers in Using the Social Sciences" Adminstrative Science Quarterly, 4 (1959), 68-80.

[26] George Nadler, "An Investigation of Design Methodology," Management Science, 13 (June, 1967), B642-B655.

[27] Eva L. Baker, "Curriculum Development Projects," in L. C. Deighton (Editor-in-chief), The Encyclopedia of Education. New York: Macmillan & Free Press, 1971. Volume 2. Pp. 579-585; Eva L. Baker, "The Technology of Instructional Development." in R. M. W. Travers (Ed.), Second Handbook of Research on Teaching, Chicago: Rand McNally, 1973. Pp. 245-285.

[28] J. K. Hemphill and F. S. Rosenau (Eds.), Educational Development: A New Discipline for Self-Renewal. Eugene, Oregon: Center for Advanced Study of Educational Adminstration, 1973. See especially the chapter by Paul Hood, pp. 101-107.

Summary

The goal of producing new knowledge in the field of curriculum is, of course, dependent upon adequate conceptualizations of the kinds of knowledge that can be produced and the processes of curriculum inquiry which are capable of generating such knowledge. Some advancement is detectable in recent years in achieving adequate conceptionalizations of curriculum knowledge production. The differentiations made in this article among various kinds of knowledge and their associated methods of inquiry are contributions to the conceptual clarification required. A number of other conceptual problems exist in the field of curriculum research. The fundamental task is to clarify the nature of the field of curriculum itself--gaining a definition of its boundaries, its subject matter, its major domains of inquiry, its more telling questions and pertinent problems, its key concepts, its generative ideas, and its conceptual systems. Perhaps these questions about the nature of curriculum can be attacked most successfully when it is recognized that the field of curriculum is conjunctive in nature and that its study must be approached through the conjunctive inquiry processes described here.

This examination of several aspects of the problem of knowledge production in curriculum can be summarized with one broad evaluative statement: a full understanding of the nature of the problem is just beginning to emerge. A look at specific reports of recent curriculum research efforts suggests that the level of understanding about the nature of curriculum inquiry does not always reach the standards required for quality knowledge production. Attention to sound epistemological and methodological principles of knowledge production in the field of curriculum inquiry seems in order. Conceptual analysis of the kinds of knowledge that may come from curriculum research and of the inquiry approaches related to each, such as has been set forth in this article, is but one effort to discover sound principles of curriculum knowledge production and to contribute to a more detailed understanding of the problem as a whole.

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Appendix B

Another Look at "Curriculum Knowledge"

Edmund C. Short
October, 1984

Looking back at one's earlier writing or speeches can be a disconcerting experience. Recently, I ran across a talk I gave in 1974 to Professors of Curriculum in Anaheim. It was entitled, "Curriculum Knowledge: Kinds and Processes" (Short, 1974). Based on ideas presented in an earlier article (Short, 1973), it addressed the topic of knowledge generated in the field of curriculum. I outlined four types of knowledge that can be produced - disciplinary knowledge, conjunctive knowledge, technological knowledge, and practical knowledge - and identified examples of each type drawn from the results of curriculum research. The major portion of that talk set forth a description of each type of knowledge and the inquiry processes associated with producing knowledge of each type.

As I look back at the contents of that talk from the perspective of 1984, ten years later, I am struck by several strong reactions I now have, both positive and negative ones. First of all, I am aware that today the ideas presented there are now much more acceptable than they were in 1974. Developments in curriculum research have moved along considerably in the direction of the language and perspective I used then. Our scholarly journals now report a greater variety of inquiry, both in types of knowledge produced (more disciplinary, technological, and practical than conjunctive) and in methodologies (historical, ethnographic, critical, humanistic, philosophical, phenomenological, etc.), than they did then.

I recall, however, that at Anaheim my colleagues grilled me on obscure points in my talk and generally did not find in it much with which they could resonate. In submitting my remarks soon after to a couple of journals for review, I also received considerable static on technical deficiencies in my presentation and little interest was expressed in the ideas themselves. Needless to say, it was never published. On re-reading it now, I can see more clearly than I did then its deficiencies in

expressing and communicating my ideas. But I am still struck by the value of many of the ideas themselves, and I do not think my contemporary colleagues think them to be so far out in left field as they once did. For that I am grateful, not so much for my own sake as for the sake of the curriculum field as a whole.

The curriculum field as a field of study has had trouble identifying a set of distinctive research questions and determining how they should be approached. Consequently, a unique body of substantive knowledge in curriculum has been slow to develop. What do we actually know in Curriculum? How well codified and teachable is this knowledge? How accessible is it to those who are engaged in practical curriculum activities who might wish to draw upon it? The least that can be said is that although more studies are now being published regularly in the field than was true ten years ago, the sense that we now possess more useable curriculum knowledge than we did then does not seem to have accompanied this proliferation of studies. Why not, we might ask?

My assessment of our problem is very much the same as I stated it ten years ago. I said then, "The fundamental task is to clarify the nature of the field of curriculum itself - gaining a definition of its boundaries, its subject matter, its major domains of inquiry, its more telling questions and pertinent problems, its key concepts, its generative ideas, and its conceptual systems." On these matters, I am afraid we have made little progress since 1974.

In my talk I gave some guidance on what I thought would be required if we were to make some headway on these matters. I said, "Perhaps these questions about the nature of curriculum can be attacked most successfully when it is recognized that the field of curriculum is conjunctive in nature and that its study must be approached through the conjunctive inquiry processes described here." I don't recall a single colleague who spoke or wrote to me about what was meant by conjunctive

inquiry, as I described it there, or who indicated agreement that in this approach we might find our way to a greater fund of curriculum knowledge.

Again, in rereading my remarks, I find my discussion of the nature of conjunctive inquiry not particularly well stated or compelling, and this, of course, may be the reason so little response to the idea was generated. Nevertheless, the reasons why the generation of curriculum knowledge has been proceeding at such a snail's pace may have more to do with our tendency to undertake curriculum research one by one as individuals, rather than in conjunction with one another or in dialogue, and less to do with grasping the import of conjunctive inquiry as the kind of knowledge production that especially characterizes this field of educational research.

For in describing conjunctive inquiry, as one among several frequently used modes of curriculum inquiry, I stressed the comprehensive and multidisciplinary character (as over against narrow individual disciplinary approaches) of this type of inquiry. I did not outline the conditions under which this approach would have to operate, that is, the collaborative and mutually stimulative environment of scholars at work together in dialogue and deliberation. I now see that these implications should probably have been spelled out rather than left implicit in my remarks. In order to make the point again, and to argue for it this time as well as to assert it, let me quote at length some of the sentences I used to describe conjunctive inquiry and then add to and amplify those earlier ideas with some thoughts that reflection ten years later compels me to offer.

> Conjunctive inquiry seeks a comprehensive conceptualization of the particular type of problem situation being studied. Producing knowledge in the conjunctive domain is roughly a matter of investigating the variables operating in a problem situation, sorting out the relevance of appropriate knowledge from disciplinary studies, and in light of implications of this knowledge, drawing together and testing conceptualizations that accurately reflect or make intelligible a piece of the problem or the problem as a whole. The process is not merely one of relating all findings from disciplinary studies which focus upon the same question (as is the case in synthesizing or summarizing disciplinary

knowledge), nor is it just a matter of seeing the relationships among the established generalizations within a discipline and producing structured (theoretical) knowledge consistent with them. Rather, conjunctive inquiry is a process of selecting and relating relevant findings from a number of separate disciplines which have a bearing on the several aspects of the practical situation being studied.

Any of the disciplinary approaches to inquiry may be applied to a question or a series of questions within the larger conjunctive question, but of necessity it will always be doing so from its own disciplinary perspective. What is required in addition to this is for someone to integrate all such relevant work into an accurate picture of the total problem. Conjunctive inquiry is interdisciplinary, in the sense that the questions probed are not by their nature restricted to the use of but one of the modes of disciplinary inquiry. Perhaps the term "multidisciplinary" best describes this approach. The disciplinary knowledge which is brought together in a conjunctive domain will not be derived, however, from a multidisciplinary approach to a single question within the problem field, but to all of the pertinent questions that arise in an attempt to understand the conjunctive activity under study. This is essentially a task of "contiguous problem analysis" by various disciplinary methods as Dubin has pointed out (Dubin, 1969, pp. 243-249).

Conjunctive research should not be thought of as the application of some method that homogenizes two or more disciplinary modes of inquiry; while it may utilize the results of disciplinary inquires of various kinds, it employs a distinct mode of inquiry which has its own integrity and is integrative, rather than analytic, in character. The aim is to construct and validate some theoretical understanding of an entire human problem or activity.

One difficulty associated with conjunctive inquiry seems to be the problem of testing the conceptualizations that are generated. Many are created but few are validated. Guidelines for the conduct of conjunctive inquiry in education are not commonly found among the handbooks on educational research. This omission is largely responsible for the low esteem in which conjunctive inquiry is held and for the low degree of defensible progress achieved by research efforts in practical fields such as curriculum. Further explication and clarification of the process of producing conjunctive knowledge is required before adequate guidelines can be communicated to researchers who wish to use them to engage successfully in conjunctive inquiry.

Whether or not my colleagues see the problem of knowledge-building in the curriculum field as requiring the type of inquiry which was designated "conjunctive" in that 1974 passage, I should like to argue that we curriculum scholars do find ourselves doing the sort of holistic conceptualization (and the testing of these conceptualizations) that is alluded to there. We are constrained by real world problems that fall within functional domains of curriculum activity such as

"selecting content" or "evaluating curricular programs." These problems are often messy and ill-defined, as they occur in day-to-day curriculum work. William A. Reid (1978, pp. 56-69) has helped us see that the identification of these practical problems is as much problematic as are their supposed solutions. The role of knowledge in helping to cope with these problems is commonly accepted by practitioners, but when they turn to the sources of curriculum knowledge, they may not find that scholars have actually generated curriculum knowledge pertinent to the particular matters in question. Or, in contrast, they may find so many different conceptualizations of the problem (most just sitting there unevaluated and uncritiqued) that they do not see which may be appropriate, although all may appear to be pertinent to their particular situation. This dilemma should cause curriculum researchers to wonder seriously what kind of knowledge is indeed most fitting in practical curriculum matters. Prescriptions? Generalizations? Analogs? Concepts? Conceptual frameworks? Perspectives? Criteria? Or what? (This is no small matter, on which little work has yet been done). But more importantly, curriculum scholars should be driven to formulate research questions and generate valid answers that at least address these natural categories of functional activity in curriculum practice (Short, 1985). These are certain to be action-oriented categories, not analytic categories, such as disciplinary inquiry is designed to address. The difference calls for conjunctive, even multidisciplinary inquiry.

Now, how do we go about this within the curriculum research community? First, we need face-to-face deliberation over researchable problems of greatest significance and value for practitioners. Published forums are of great help, but with this procedure the amount of dialogue and conjoint decision-making is inevitably more limited than is possible in face-to-face discussions. Then, planning of joint research projects must be carried out. That calls for the work of inquiry to be divided according to a conjunctive plan among the most competent researchers

able to engage in inquiry of the needed kinds so that, when all pieces are done, the results may be related to one another around the "whole" or the entity being investigated. This third, integrative task is still another that no one researcher alone should be expected to do; it entails judgments, both technical and normative, over which deliberation must be conducted.

I would be among the first to admit that we are not now organized to do this sort of conjunctive inquiry readily, and it will be most difficult to mount the necessary organization to facilitate it. Nevertheless, in small ways, by volunteer groups, such work is being, has been, and still can be carried out in a fashion close to that described. In 1974, I mentioned conjunctive studies reported by Beck, et al. (1971), Haubrich (1971), Barkman (1970), and Lawler (1970). Today I can mention some more recent ones, Fullan (1983) and Short (1984). Someone may have to develop more appropriate structures more effectively supported, however, if this work is to flourish in the future.

I now turn to other reflections and assessments of the types of curriculum inquiry I set forth in my 1974 paper. Disciplinary inquiry is one about which there was then, and is now, seldom any serious argument about its applicability in curriculum research. I described, and gave examples of, historical, philosophical, political, economic, and sociological studies that yield disciplinary knowledge from the literature of that period. The work of Cronbach and Suppes (1969), Gowin and Millman (1969), Thomas (1972), and Broudy, et al. (1973) were cited as having suggested the value and legitimacy of the use of more diverse forms of disciplinary inquiry than were commonly recognized prior to this period. Curriculum inquiry, I thought, was an appropriate field of research in which this recommended diversity of inquiry methods should be utilized. I urged that curriculum researchers learn as much as possible about how to conduct inquiry of a particular type so that the quality of our studies could be beyond fault. I bemoaned the lack of systematic

sources on conducting the various forms of disciplinary inquiry as applied to curriculum. In the intervening [illegible], we have had some very good articles appear on some of the newer forms, ethnography, criticism, phenomenology, critical theory etc., e.g., McCutcheon (1981), Willis (1978), Vallance (1983), van Manen (1984), Giroux (1979). But no authoritative handbook has yet appeared covering the variety of such approaches to curriculum inquiry. I stand by my assertation of 1974 that curriculum researcher's "proficiency in understanding and employing disciplinary modes of inquiry must increase." I know of no study which has attempted to detect whether curriculum inquiry in one or another of these disciplinary forms has, in fact, improved in quality over the last ten years. I am conscious, however, as I read the literature, that there is clearly more diversity in what is being produced. That I believe is a promising trend, for it bodes of our getting at matters from more perspectives than was possible when one or two modes of inquiry dominated our research efforts. My only criticism, apart from the absence or the ambiguity of available data on these trends, is that it may still be possible that the disciplinary inquirer is asking and answering irrelevant or unnecessary questions. Useless knowledge may thereby be accruing. We don't know for sure that this is the case because studies of curriculum knowledge use are scarce or non-existent. (That is a domain of concern that could usefully be examined.)

I did not in 1974 place a value judgment on the importance of disciplinary inquiry in relation to conjunctive inquiry. I suggested only classifications of inquiry, including these two and two others, technological and practical inquiry. Perhaps today I would be bolder and state that the amount and kind of disciplinary inquiry should be governed by the requirements of conjunctive inquiry. I do not mean, by saying this, as some have suggested when I more recently tried to make the same point, that we should control who studies what and attempt to sanction some and not other work. This would violate the spirit and intent of free inquiry, and I have no

desire to set these important values aside. I merely would argue that people are always making decisions about what to study and how; can this not sometimes be done in deliberation with others where information and arguments about what is most important to do now are honored and settled in light of known circumstances? This might result in knowledge that is more relevant and less wasteful of limited research resources.

My 1974 remarks on technological inquiry and technological knowledge seem to be less telling today than I thought they were then. Of course, it is true, as I said, that "technological knowledge (often called development) is perhaps the most frequently sought type of knowledge which can be produced by scholarly methods of educational inquiry." This type is related to achieving a practical end, already set in advance of development. Nelson, et al. (1967, p. 8) state that "the body of technological knowledge is a set of techniques, each defined as a set of actions and decision rules guiding their sequential application, that man has learned will generally lead to a predictable outcome under certain circumstances." I believed in 1974 that many curriculum scholars were devoted to producing this kind of knowledge in areas like program evaluation technologies, curriculum design technologies, decision-making technologies, etc., but that we needed to be proded to develop more varied technologies in these areas and perhaps new categories of curriculum technology as well. I listed a series of general technologies and particular products that had been added to the fund of curriculum knowledge by 1974 but suggested that our repertoire of curriculum technologies was insufficient to meet our current needs.

In the intervening ten years, not much development of new technological knowledge appears to have been generated. In view of what I then hoped for, perhaps I should be greatly disappointed by this lack of progress since 1974. I am not, however, very concerned about this state of affairs, and I think it is because we

have come to recognize more than we did then that procedural matters in curriculum, because they are so situationally oriented and quite often dependent upon unique factors that are different in each situation, require a large measure of deliberate judgment about what to do in the particular circumstances to bring about a given end, and not simply the application of a tested and a proven general technology. The goal of trying to find the one best technology for achieving a certain type of goal in curriculum affairs seems to me to be a less wise or helpful goal than I thought in 1974 (Apple, 1983, pp 149-153). Even if appropriate technologies were available, would they work in every instance? Probably not, unless a great deal of human adjustment of the technology were attempted, and here we are back to deliberation and judgment again. We are somewhat less enamoured in curriculum today by technological rationality than we were in 1974, and I think rightly so. Still, I remain uncertain of the role and extent to which we could benefit from the generation of technological knowledge in curriculum. It must have some valid place within our store of curriculum knowledge, but just what is its place? We have barely begun to raise that question, let alone answer it satisfactorily.

As for the methods of doing technological inquiry, I cited work by Guetzkow (1959), Nadler (1967), Baker (1973), Hemphill and Rosenau (1973) as descriptions of the idealized development process. Sanders (1981) gives a more resent view of this form of inquiry and it seems to be less "technological" than the earlier citations.

Finally, I want to comment upon "practical knowledge," as I described it in 1974. I declined to outline an appropriate inquiry approach yielding such knowledge because I construed it to be done ideosyncratically and thus was not communicable. I stated these ideas as follows:

> The creation of practical knowledge, the fourth type, is internal to each individual who produces it. The methods of producing it are uniquely individual and, therefore, cannot be extracted and generalized for use by others. This fact can be detected by observing an exceptionally talented and experienced curriculum worker, for instance, who is recognized as making judgments and taking actions that are eminently appropriate and

> successful. Such a person is in possession of considerable practical knowledge which is uniquely his own and which makes possible consistently wise performance. This type of knowledge is a result of a person's unique accumulation of experience and an excellent command of a variety of appropriate technologies for accomplishing goals for which he is responsible. No doubt, as well, he has a wide repertoire of accurate conceptualizations of conjunctive and disciplinary domains of knowledge upon which he can draw when he needs to create practical courses of action for which tested technologies do not exist.
>
> This individualistic, situational character of practical knowledge makes it of more concern to the educator and trainer of practitioners than it is to the producer of knowledge, who views the matter from a research perspective. Since the chief interest in this article is with the creation of curriculum knowledge and with those valid communicable methods of inquiry which can be identified and learned by those seeking to conduct curriculum research, this fourth type of knowledge will not be stressed. Nevertheless, practical knowledge is of such importance that it cannot be ignored, even in the context of an analysis of research. To leave out an analysis of the fourth type of knowledge would leave unclear the value and use of the other three categories of knowledge produced, for it is in the forming of practical knowledge that all of the others reach their ultimate application. It should also be clear from this analysis why so many persons who are at the point of having to make judicious practical judgments are handicapped if they have not incorporated knowledge of the first three types into their own operational repertoire.

I stand by these remarks today, but I am aware that this practical knowledge should probably have been referred to as personal professional knowledge. It is clear that some of a practitioner's personal practical knowledge is public knowledge, as my last sentence implied. There have been some recent attempts to study dimensions of the practitioner's practical knowledge which not only externalizes some of this personal knowledge but also renders it useful to others, if not in the form of valid generalizations, perhaps in the form unique expressions of common experience (Elbaz, 1983). While studies of what people possess in the way of practical knowledge is important, equally or more important is knowing how they process and acquire that personal practical knowledge. We are still a long way from knowing much about this.

The chief purpose of my 1974 talk was to demonstrate why clear distinctions among the four types of curriculum knowledge and their associated inquiry processes

are so important for curriculum scholars to understand. These distinctions are no less important in 1984. I said,

> Curriculum researchers may at times be unclear about the type of knowledge they wish to produce and the methods of inquiry appropriate for generating that type of knowledge, and may, therefore, fail to conduct their studies in the fashion most likely to produce quality results. On the other hand, if they are able to classify what types of knowledge they are aiming to produce, they may be able to avoid wasting considerable time and energy in making, then correcting, some mistakes that often occur in carrying out research (for example, applying empirical methods of inquiry to a conjunctive problem, or working to synthesize disciplinary knowledge in an effort to generate technological knowledge). Conceptual clarification, such as is being set forth here, should be considerable value to the researcher in determining what exactly he is aiming to produce and what methods of inquiry are appropriate to the task.

This statement holds today, I think, as well as it did when it was first set forth. Whether those engaged in producing curriculum knowledge today have become aware of these clarifications and are doing better research because of it, I do not have a valid way of determining.

Another look at the content of the 1974 paper may still be useful for those who may suspect they still need some clarification on what types of curriculum knowledge can be produced and generally how producing each type is different from all the other approaches. My reflections upon what was said then have yielded a few changes in specific points and perspectives, but the original distinctions seem to be trustworthy still. I hope their reiteration here will be useful for those who did not have the opportunity to hear the original presentation of these ideas and who may now wish to entertain them for whatever value they may have for them.

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