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A STUDY OF THE FUNCTIONAL RELATIONSHIP BETWEEN
JOHN DEWEY'S THEORY OF INQUIRY AND
CLASSROOM TEACHING STRATEGIES
DESIGNED TO IMPLEMENT
INQUIRY THINKING

A Dissertation Presented
By
JAMES C. BARBER

Submitted to the Graduate School of the
University of Massachusetts in partial fulfillment
of the requirements for the degree of
DOCTOR OF EDUCATION
May 1979
Education
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School of Education
DEDICATION

I dedicate this dissertation to a great teacher, my wife Judith. Without her sacrifices and encouragement, I would never have started nor finished this dissertation. Its completion is a tribute to her love and understanding. Us can!

I would also like to dedicate this dissertation to all those who along the way have given me a kind word or two of support. This has been much appreciated. A lesson that I have learned is that support from others is as necessary to life as is the air that is breathed.
ABSTRACT

A Study of the Functional Relationship Between
John Dewey's Theory of Inquiry and
Classroom Teaching Strategies
Designed to Implement
Inquiry Thinking

(May 1979)

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The principal question addressed in this study is, "How can John Dewey's theory of inquiry contribute to constructing strategies of inquiry teaching?" There are also five secondary questions which are addressed. These secondary questions assist in answering the primary question. The secondary questions are: (1) What are the issues involved in the relating of theory to practice? (2) What is Dewey's theory of inquiry? (3) Have there been any significant attempts to implement the theory?
(4) What would the integration of theory and practice be like? (5) What are some conclusions and recommendations regarding the use of the theory?

The issues involved in the question of relating theory to practice and Dewey's position on the issues are presented. Dewey's theory of inquiry is explicated. Attention is focused on the logic of inquiry and on the role of experience. Comparative analysis is used to heighten the distinctions between Dewey's philosophy and the philosophy of logical positivism. The "project method" of William Heard Kilpatrick is offered as an example of a distorted conception of Dewey's philosophy. The use of Dewey's philosophy at the laboratory school which Dewey founded and directed is presented. Inquiry teaching strategies that conform to Dewey's theory of inquiry are presented. These strategies are critiqued with reference to the philosophical foundation of Dewey's theory of inquiry. Recommendations and conclusions regarding Dewey's theory and possible uses of it as a basis for teaching strategies are offered.

The teaching strategies presented are derived from an interpretation of Dewey that rejects an exclusively child-centered as well as a positivistic approach to inquiry. A teacher's use of Dewey's entire philosophy as a basis for making classroom decisions about inquiry teaching is stressed.
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CHAPTER I
INTRODUCTION

The Problem

In general, most classroom teachers tend to view philosophy and theory as not having much relevance to teaching practice. In particular, in their inquiry teaching, most teachers tend to overlook the philosophy and theory of John Dewey.

The separation of Dewey's theory from its practice has resulted in teachers failing to take advantage of teaching strategies which logically can be derived from the theory. This failure has resulted in teaching that misrepresents Dewey's notions of inquiry. Equally, this failure to connect Dewey's theory with practice has resulted, as Lawrence Metcalf has pointed out, in Dewey's theory of inquiry never receiving a substantial test in practice.¹

The Purpose

The purpose of this study is twofold. The first is to examine the use of John Dewey's theory of inquiry as a guide to teaching practice. The second is to examine the practical value of philosophy and theory. Dewey's theory of inquiry, and the function that it can serve to guide in the development of inquiry teaching strategies, is offered as the quintessence of the relationship between theory and practice. Thus, the primary question addressed in this study is, "How can Dewey's theory of inquiry contribute to constructing strategies of inquiry teaching?"

An assumption of this study is that, in general, connections are rarely established between philosophy and educational practice. The American temperament tends to reject dealing with abstractions and tends to be impatient with philosophy. Significant philosophical issues, such as the nature of knowledge, the role of values, and the nature of reality, tend to be viewed as speculations having little, if any, relationship to practice. On this matter, the educational philosopher Hugh Black said, "Most of the time we pay no attention to theory, and in American education knowledge of educational philosophy counts for very little."²

A second assumption of this study is that if there is, in general, a lack of relating theory with practice, there is, in particular, a lack of relating Dewey's theory of inquiry with inquiry teaching practices. In fact, research indicates that the average classroom teacher does not have an understanding of Dewey's philosophy.³

On the other hand, teachers do have ideas. These ideas may not qualify as full-fledged philosophical thought, but nonetheless they affect classroom teaching behavior. Some of these ideas conform to Dewey's philosophy. Some of these ideas are in conflict with Dewey's philosophy. Hopefully, this study will serve to assist one to clarify his ideas relative to Dewey's philosophy. It is hoped that by doing such, Dewey will not be associated with teaching strategies and ideas contrary to his philosophy.

It should be stated that Dewey has become a comparatively neglected figure. He is hardly ever studied anymore. In fact, he is studied even less today than in previous years.⁴ Steven Cahn has recently remarked, "Ironically, Dewey, so long the dominant force on the


American philosophical scene, is now, less than twenty-five years after his death, no longer much studied or discussed."^5

The irony is extended even further when it is realized that inquiry teaching does take place in the nation's classrooms. Consequently, an important issue is the kind of inquiry teaching taking place. The author of this study contends that the kind of inquiry teaching presently being employed is not lacking in a philosophical foundation. The foundation may be by default rather than by design; nonetheless, it is contended that the concrete activities of the classroom will manifest a philosophy. In this regard, this study may serve to shed some light on the philosophical nature of present inquiry teaching efforts.

The teaching strategies that will be presented here have been derived from a particular interpretation of Dewey's ideas. The interpretation of Dewey represented in this dissertation is not a unique or a novel one. If it should seem to the reader that this interpretation of Dewey is an unusual one, it may be because it is less well known than are other interpretations of his work.

It is asserted by the author that an explanation of Dewey's theory of inquiry with concomitant teaching ex-

^5Ibid.
amples happens to be a rarity. There have been countless articles and books on Dewey's philosophy, but there have been few attempts to examine the relationship between Dewey's theory and the development of inquiry teaching strategies.  

Finally, the author feels that a contribution of this dissertation has been to reopen a neglected interpretation of Dewey's philosophy and to present actual teaching examples that would logically follow from the interpretation.

The Design

Research has been made into the major writings of John Dewey. Primary sources, as well as supplementary sources, are used. Comparative analysis is used. For example, Dewey's philosophy is compared to traditional notions of logic.

Critical analysis is used. A critical analysis is made of the "Project Method" of William Heard Kilpatrick. The critical analysis is used to illustrate the distortions that may result when an attempt is made to relate Dewey's philosophy to educational practice.

It can be said that the design of the dissertation has four major characteristics:

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(1) The descriptive-analytic, articulating and making explicit Dewey's theory of inquiry.

(2) The prescriptive-practical, presenting examples of inquiry teaching which conform to Dewey's theory.

(3) The historical study. A critique of Kilpatrick's conception of Dewey's ideas.

(4) Conclusions and recommendations. As a result of this study, there will be conclusions and recommendations pertaining to Dewey's theory of inquiry and its use in the classroom.

The primary question addressed in this study is, "How can Dewey's theory of inquiry contribute to constructing strategies of inquiry teaching?" There are also five implementing questions to be addressed in this study that assist in answering the primary question. The five questions are: (1) What are the issues involved in the relating of theory to practice? (2) What is Dewey's theory of inquiry? (3) Have there been any significant attempts to implement the theory? (4) What would the integration of theory and practice be like? (5) What are some conclusions and recommendations regarding the use of the theory?

The five implementing questions serve as the basis for the chapters of the dissertation. They establish the purpose of each particular chapter. By responding to these
questions, the primary question of the dissertation will be addressed.

**Delimitation**

This dissertation will not attempt to justify or defend Dewey's theory of inquiry or his philosophy, neither will it attempt to change those people who are resistant.

The dissertation attempts to examine the significance of Dewey's ideas as they pertain to inquiry teaching. The significance of these ideas, and not the defense of them, constitutes the major emphasis of the dissertation.

The dissertation does not attempt to answer the question of the overall effectiveness of using Dewey's theoretical base to derive instructional strategies of inquiry.

The dissertation will not attempt to definitively establish what constitutes inquiry behavior. It will give general norms for inquiry behavior from the Deweyan perspective.

The dissertation does not establish itself as the grand interpreter of Dewey's philosophy, or of what constitutes teaching behavior according to and from his philosophy. The dissertation does suggest, however, that the teaching strategies developed are dependent upon the interpretation. Therefore, to do justice to Dewey, this dissertation does not hold that it has the absolute interpretation.
Definition of Terms

Concept: The relationship made from data or experience. Concepts are ideas. They are the intellectual deposits of an experience. They have varying degrees of generality. Concepts are used to organize our experience. E = MC^2 is a concept, and so is "Culture is learned." A relationship between culture and learned has been established.

Experience: Used in the Deweyan sense, it is the transaction between self and environment. Through the process of self and environment acting upon and influencing each other, experience is created. Experience is the result of a transaction. It stands for all of our commerce with the world. It is binary, not solitary. Experience is dependent upon something else with which to transact. Hitting a tennis ball is an experience. There is the person and there is the tennis ball, not to mention the racquet.

Inquiry: This term can be described more than it can be defined. For the purposes of this study inquiry has two meanings. In one, it is the method of science. In the other meaning, inquiry is more than the method of science. In this usage, it is the process formulated by Dewey of deriving and testing concepts. The concepts can be used to solve problems. It is the method of thinking
by which human beings organize their experiences through 
the construction of concepts that can be tested and trans-
ferred to many different situations. Use of the method 
could result in warranted assertions or knowledge claims 
being made. Inquiry carries within it its own value 
system. Inquiry is an experimental attitude. It is a way 
of viewing life. It is a way of dealing with life. It is 
a way of dealing with experience.

**Inquiry Teaching Strategies:** This is a very inclu-
sive term, and it is meant to be. Inquiry teaching 
strategies refers to all of those things a teacher can do 
to have students develop skills and values which conform 
to Dewey's philosophy. The criteria used are that the 
learning experiences planned by the teacher must have a 
basis in Dewey's philosophy and can be related to the parts 
of his philosophy as well as the whole of his philosophy. 
In essence, what the teacher does in one particular learn-
ing situation can be understood by viewing it in its rela-
tionship to other parts of the philosophy the teacher has 
used for constructing learning experiences. Inquiry teach-
ing strategies refers to what the teacher is doing, which 
is basically planning his teaching using Dewey's philosophy 
as a guide.
Empiricism: The philosophical belief that our knowledge is the result of our experiences with the world. Experience is external. Experience imprints upon us what we know. We do not have to transact with experience. We merely have to be exposed to it.

Pragmatism: The belief that knowledge comes from experience. However, experience is a transaction, not an imprinting of sensations. The given world of "brute facts" depends upon human beings to give it meaning. The elements of experience may be a given, but the experience itself is not a given. The experience is the relationship made from our transaction with the given elements. The experience, thus, results in concepts or hypotheses being developed. When we talk about pragmatism we are referring to Dewey's philosophical position.

Positivism: The view that knowledge comes from experience. However, there is an objective world that exists independently of human transaction. Reality is an objective world with an already formed character. Human transaction is not necessary to its meaning. Positivism also contends that the knowledge that comes from experience can be reduced to basic elements. Certain statements which cannot be reduced, generally value statements, are meaningless.
Functional Relationship: A relationship of utility. A and B both have utility in relation to each other. Theory serves to give practice direction. Practice serves to implement the ideas and principles of theory.

Theory: Theory is a logical framework. Ideas are related to each other so as to explain a set of facts or experience and provide guidelines to action. For our purposes, theory can be used interchangeably with the term philosophy. They both deal with abstractions to guide human conduct. On the other hand, as used in this study, theory is assumed to be subsumed within philosophy. Many theories constitute a philosophy. For example, a philosophy comprises a theory of knowledge, a theory of values, and a theory of being or ontology.

Transference: The principle that what is learned in the formal school setting should be able to be used outside of the formal setting, and what is learned outside of the formal school setting should be able to be transferred inside to it. It is also the attempt to apply previously learned ideas and skills to a new situation.
CHAPTER II

THE RELATIONSHIP OF THEORY TO PRACTICE

The purpose of this chapter is to introduce the significant issues generated by the debate over the nature of the relationship of theory to practice, and then to present Dewey's position on the matter. The contention is that Dewey's position on the matter is reflected throughout his philosophy.

An Introduction to the Function of Theory

A brief overview of the function of theory finds that it has many functions. Theory puts the results of scientific investigation into a system. Theory plays a part in establishing empirical laws. Theory is used to explain experience. Theory is used to guide inquiry.1

The philosopher Ernest Nagel maintains that there are four functions of theory. In the first function, theory is a body of propositions used to explain experience, for example, Marxian theory. In the second function,

theory is used to refer to an individual law or generalization, for example, "The law of effect" in psychology, or the laws of thermodynamics in physics. In the third function, theory is used to designate a class of variables or attributes. Keynesian economic theory is an example. This theory rests on single attributes such as the national income, and the total investment and consumption expenditure, which are classified into a structure. In the fourth function of theory, theory is used to clarify concepts. For example, the concepts of Newton's theory of gravitation would receive further analysis and clarification in light of Einstein's theory of relativity. In essence, one theory is used to clarify another theory.²

**Introduction to Descriptive and Prescriptive Theory**

Two critical points of view concerning theory and its relation to practice are identified in the literature. The focus is on the meaning of these views in terms of educational theory and practice. The first point of view is represented by those philosophers who contend that theory does not have a relationship to practice. In this view, ²Ernest Nagel, "Philosophy of Science and Educational Theory," *Studies in Philosophy and Education* 7 (Fall 69): 8-11.
theory is perceived to be purely a detached scientific account of the teaching and the learning process.

Conversely, the second point of view is represented by those philosophers who contend that theory can provide guidelines for teaching practice. Generally, but not always, empirical findings provide the basis for the guidelines. The tendency is to view behavioral scientific theory as capable of providing guidelines for teaching practice. This view perceives educational theory to be normative. In this view, theory is capable of establishing a criterion for practice.

These two points of view reflect two philosophical positions. The positions can be stated thusly: theory is descriptive. Theory is prescriptive. It is contended that the adoption of either one of these positions or variations of them can have a bearing on the treatment of theory in its relationship to practice.

**Descriptive Theory**

Descriptive theory is empirical theory. It is scientific theory. Scientific principles are constructed. Logical conclusions are drawn from the principles. Predictions are made. There is experimental confirmation of
hypotheses. Descriptive theory purports to tell what is the case. It attempts to describe the world as it is, without making use of value judgments. Newton's theory of gravitation is an example of descriptive theory. Newton's theory is used to describe and explain actual events in experience. Experience is deemed to be capable of being described objectively. Much research and evaluation claims to be descriptive. It claims to be an objective measurement of observable facts. It claims that experience can be quantified uncontaminated by subjective factors, or measures can be employed that make allowance for the contamination. In this view, there is a division between objectivity and subjectivity. There is a division between facts and values. Facts are facts. They can be measured. They can be counted.

Descriptive theorists. Ernest Nagel is one of the most prestigious proponents of the descriptive theory view. Nagel holds that the function of empirical theory is to describe and to explain experience, not to make prescriptive assertions about what ought to be. Nagel does not believe that descriptions can be yielded from prescriptions. Nagel objects on the grounds of logic. Logically,

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prescriptions and descriptions are unlike terms. Nagel argues that descriptive propositions do not contain value terms; therefore, it is logically impossible to derive a value term from them. Nagel says, "In short, I subscribe, certainly, to the very ancient proposition that statements as to what ought to be are not deducible from statements of what is despite the attempts to confuse the issue by a great number of people, who argue that in some way this is possible." 

Nagel contends that it is a mistaken view to contend that philosophy, even if it contains empirical propositions, can be used prescriptively. For that matter, Nagel does not think that behavioral scientific theory can be used to derive prescriptions for practice. Nagel is contending that from an empirical psychological theory such as Skinner's operant conditioning theory, it is logically impossible to derive educational practices. In this regard Nagel says, "And I would like to ask, in the first place, can educational aims be derived from any descriptive theory of human

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5 Ibid.

6 Ibid., p. 19.
nature? And I want to maintain that this is not, in point of fact, possible."7

Nagel is a dualist. He asserts rational method cannot be used to make value judgments because values are outside the ambit of scientific inquiry. Values do not have an empirical base. Facts can be empirical. Values cannot be empirical.8 Nagel argues for a philosophy of science, or a descriptive theory that, in his words, "calls attention to basic distinctions such as that between fact and value and the way in which factual statements require to be supported, and the way in which value judgments require to be justified."9

The philosopher B. O. Smith is in accord with Nagel's descriptive position. B. O. Smith states, "Any effort to apply philosophical or scientific knowledge directly to teaching will fail."10 Smith, like Nagel, is skeptical of inferring from any philosophical or behavioral scientific theory a prescription for teaching. In Smith's view, descriptive theory is empirical and not subject to the derivation of value assertions.11

7Ibid.
8Ibid., p. 19.
11Ibid.
Prescriptive theory recommends and provides guidelines for practice. Prescriptive theory is normative. It suggests what ought to be the case. An important claim of prescriptive theory is that what ought to be the case can be derived from what is the case. In essence, prescriptions can be derived or implied from descriptions. For example, if it is a finding of science that men engage in inquiry in a certain way, then this is the way inquiry ought to be taught in the schools. The findings also imply inquiry ought to be taught.

On the other hand, as P. L. Smith states, "Prescriptive assertions tell us what ought to be the case, regardless of what is the case." Generally, however, prescriptions are derived from a descriptive account of the world. Clements states, "Prescription in education should be based on descriptive knowledge of the world, educational phenomena, and acquaintance with the values and aspirations of a culture."13

There are countless examples of prescriptive theory. Marxist theory is an example. From its scientific account

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of experience, it prescribes what the role of the state ought to be in the life of its citizens. The organizational management theory of Douglas McGregor is an example of prescriptive theory. This theory prescribes how the management of organizations ought to be conducted.

Instructional theory is an example of prescriptive theory. Jerome Bruner states, "A theory of instruction is prescriptive in the sense that it sets forth rules concerning the most effective way of achieving knowledge or skill. By the same token, it provides a yardstick for criticizing or evaluating any particular way of teaching or learning."14

Prescriptive theorists. The educational philosopher Harry Broudy contends that prescriptions for practice can be yielded from empirical theories. Broudy states, "The behavioral sciences in principle can provide theory that could be 'applied' to problems of educational practice. One well known example is the theory of operant conditioning which has been turned into a strategy of teaching; another is John Dewey's description of the complete act of thought."15


It is apparent that Broudy is willing to generate prescriptive assertions from descriptive theory. On the other hand, Broudy does not feel that philosophy can be classified with empirical theory. In fact, Broudy maintains that to attempt to prescribe from philosophy is to misunderstand the role philosophy plays in educational thought and practice. The role of philosophical theory is to interpret and clarify objectives. The role of philosophy for Broudy is an interpretive role. Other disciplines that can be classified into the same interpretative category as philosophy are history, political science, and some forms of sociology.16

The educational philosopher Joe Burnett feels that if philosophical theory were to be used to entail prescriptions, the theory must be consistent with the tested conceptions of science. Burnett contends that this condition must be satisfied if prescriptions were to be implied from a philosophical theory.17 Burnett holds that, in general, formal philosophies cannot be used to derive logical implications for educational theory and practice. Burnett does have one qualification. He feels there is a possibility

16 Ibid.

of logically deriving propositions from a philosophy if the philosophy makes connections with previous ideas and values.\textsuperscript{18} Other than this exception, Burnett asserts, empirical theory must be used to derive prescriptions.

Probably one of the outstanding contemporary examples of an attempt to convert empirical findings into prescriptions for teaching is done with the research findings of the Swiss psychologist Jean Piaget. The findings of Piaget on the various stages of cognitive development are currently being utilized to devise teaching strategies that conform to the stages of development.

It should be pointed out that it is possible, although it may not be acceptable to some philosophers, to derive prescriptions from a philosophical theory that by and large does not have what is considered an empirical base. For example, this is done with a Jesuit education where educational practices are, in the main, derived from a value base.

Relevant to this point, the philosopher Israel Scheffler contends Dewey's account of the process of inquiry appears to be descriptive. However, Scheffler argues

\textsuperscript{18}Ibid., p. 67.
it is "rather normative than descriptive." Thus, Dewey may be deriving prescriptions from normative assertions. Dewey may be deriving guides to educational practice from a value base.

Summary

Several significant issues have surfaced: (1) Prescriptions can only be derived from empirical theory, (2) The empirical can only be identified with the behavioral sciences, (3) Prescriptions and descriptions are separate and distinct from each other. Therefore, prescriptions cannot be derived from descriptions. Prescriptions are normative assertions. They represent a value, a preference of what ought to be done. Values are separate from descriptive facts. It is a violation of logic to derive prescriptions from descriptive statements. Accordingly, there is not any relationship between theory and practice. Theory is one thing. Practice is another thing. Practice is prescription. Theory is description.

---

Dualism

The contention that prescriptions and descriptions are separate and distinct is labeled dualism. Dualism is the philosophical view that experience is composed of bifurcated entities. In a dualistic view, mind and matter, fact and value, theory and practice, knowing and doing, subject and object, the individual and society would be viewed as being separate and distinct.

The seventeenth century philosopher Rene Descartes represents the classic dualistic position. Descartes contended that mind and matter were separate and distinct. Mind was represented by thought. Matter was represented by the body. The things which belonged to the physical world of matter were external and objective. The things of the mind were internal and subjective. There was an objective world of facts. There was a subjective world of values. 20

Dualism Denied: The Critical Theory of Jürgen Habermas

The contemporary German philosopher Jürgen Habermas challenges all forms of dualism. Habermas challenges the

absolute distinction between empirical assertions and value judgments. He challenges a dualistic view of theory and practice.

Habermas contends that theory is very much related to practice. Habermas perceives theory as having a critical function, and as having a fundamentally practical interest to guide it. This practical interest is normative. For example, critical theory has a practical interest in radically improving human existence.21

Habermas contends that the practical tends to become confused with the technical. He maintains that the tendency of contemporary thought is to reduce all problems of action to problems of technical control and manipulation.22 Habermas maintains that this situation has come about because of the separation of values from practical concerns. However, for Habermas, practical questions are normative. They are not technical. For example, the practical question of "What ought I do" cannot be solved technically. In the classroom, techniques of behavior modification are technical. Nonetheless, the practical problem for the


22 Ibid., p. 188.
teacher is "Towards what ends should a student's behavior be modified?" This is a normative problem. In the view of Habermas, the technical is not separated from the normative.

Habermas's position shows us that practical questions that cannot be framed in terms of technical problems are not discussed very seriously, if at all. For example, there may be good reasons for building a nuclear plant. There may be good reasons for not building it. However, in the view of Habermas, the technical question of how would be more readily addressed than the normative question of why. By not addressing the why question, dualism results. Values are divorced from technical or scientific questions.

Campbell states that every practical problem is a problem in research. Habermas disagrees. He contends that practical problems cannot be solved solely by research efforts. A research problem tends to be viewed as a technical problem. Viewing a practical problem as a research problem denies the normative aspects of problems.

The inquiry of research is empirical. Empirical research, or descriptive theory, is limited in its critical function. Empirical inquiry seeks to establish scientific

laws and principles. It does not seek to engage in critical inquiry. Critical inquiry raises normative questions. Empirical inquiry separates values from empiricism. When this is done, Bernstein, in interpreting Habermas, points out, "The relationship of theory to practice can now only assert itself as the purposive rational application of techniques assured by empirical science."  

Habermas would contend that many prescriptive theorists uncritically adopt the results of empirical research. In their zeal to derive prescriptions from empirical theory, many prescriptive theorists do so without consideration of the normative implications of their efforts. 

Habermas contends that what is needed is a unity of theory and practice so that practical questions can be addressed in a normative rather than in a technical manner. The unity of theory with practice will not tell us how to precisely change the world. This would imply a positive science. Theory cannot be reduced to such. The unity of theory with practice will mean that the value implications as well as the technical implications of practice would be critically discussed. 

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25 Ibid., p. 219.
Habermas feels that the present separation of theory from practice has resulted in disinterested practitioners applying scientific techniques devoid of consideration of the value implications of their practice.²⁶

Dewey's Position on the Relationship of Theory to Practice

Dewey perceived an intrinsic connection between theory and practice. The significance of theory was in its function as a guide to practice. Theory gave direction to practice. Dewey thought that formal philosophical theory could be used to guide practice. Dewey thought that philosophical theory could be used to imply prescriptions. Dewey said, "A philosophy of education, like any theory, has to be stated in words, in symbols. But so far as it is more than verbal it is a plan for conducting education."²⁷

The significance of Dewey's position rests on the premise that theories are revised in the light of experience. Dewey viewed theory experimentally. He perceived theory as a set of hypotheses to be tested in experience. This experimental orientation permeated Dewey's entire

²⁶Ibid.

philosophy. In fact, Dewey's theory can be labeled experimental theory. This author contends that a justification for deriving prescriptions from Dewey's philosophy resides on the premise that the theory is experimental. Prescriptions derived from Dewey's philosophy are to be tested in experience. In this sense, Dewey perceived philosophical theory as empirical theory. Through the assertion that its ideas can be tested in experience, philosophy is deemed empirical.

The educational philosopher D. B. Gowin states this position quite succinctly. Gowin states, "It is often thought that philosophy is not as objective as empirical research. But if objectivity means what other persons can corroborate, then objectivity can result from philosophical discourse." Gowin's point is that the principles of philosophy can conceivably be subjected to a public, social test in experience.

Dewey was not a dualist. He did not separate theory from practice. Dewey attacked dualism by maintaining that there were practical elements and bearings already contained


in theory. He said, "The argument that theoretical instruction is merely abstract and in the air unless students are set at once to test and illustrate it by practice-teaching of their own, overlooks the continuity of the classroom mental activity with that of other normal experience."\textsuperscript{30}

Dewey did not separate empirical assertions from normative assertions. Dewey stated, "When all is said and done in criticism of present social deficiencies, one may well wonder whether the root difficulty does not lie in the separation of natural and moral science."\textsuperscript{31} The absolute distinctions between prescriptive assertions and descriptive assertions are viewed by Dewey as remnants of an archaic dualism. On this matter, P. L. Smith points out that a statement such as, "Intelligence is demonstrated by speed in calculation" is a prescriptive as well as a descriptive statement.\textsuperscript{32} Smith asserts, "This statement is not only describing but also prescribing how intelligence ought to be viewed."\textsuperscript{33}

\begin{flushright}
\textsuperscript{33}Ibid.
\end{flushright}
measured empirically, but in doing so we are also saying such a measurement is what we value to be a demonstration of intelligence.

Dewey did not think behavioral science findings could be directly converted into prescriptions for teaching. Dewey said, "Laws and facts, even when they are arrived at in genuinely scientific shape, do not yield rules of practice."\(^{34}\) Dewey did not discard research findings, nor did he feel that they had no use. However, he did feel their use was dependent upon the conditions of an experiential setting. He felt that the research findings of a laboratory environment were one thing, and the environment of a classroom was another thing. In essence, empirical findings did not prescribe a rigid set of procedures.\(^ {35}\)

Dewey, like Habermas, had a critical perspective of practice. Dewey was concerned about the normative implications of practice. He said, "Philosophy, thus, has a double task: that of criticizing existing aims with respect to the existing state of science . . . and interpreting the results of specialized science in their bearing

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\(^{35}\)Ibid., p. 29.
on future social endeavor."  Dewey foresaw that the objectives of science and the results of science had ethical bearing on practice. He did not view the process, nor the results of science, in a technological manner.

Finally, Dewey was aware that good teaching could be done by persons who have never had any instruction in either the theory or the practice of teaching. Dewey said:

We have here, I think, the explanation of the success of some teachers who violate every law known to and laid down by pedagogical science. They are themselves so full of the spirit of inquiry, so sensitive to every sign of its presence and absence that no matter what they do, nor how they do, they succeed in awakening and inspiring like alert and intense mental activity in those with whom they come in contact.  

Dewey realized such a teacher was the exception and not the rule. Dewey thought that it was more reasonable to believe that a conscious reference to theory would prove to be a valuable asset in teaching, and would indeed be an effective tool for turning out good teachers. He believed that conscious reference to theory would help to make practice more intelligible by allowing the assessment of teaching behavior relative to a set of norms.


38 Ibid., p. 327.
The purpose of this chapter is to explicate John Dewey's theory of inquiry. Although there are always appropriate sub-sections, Dewey's theory of inquiry can be divided into four sections: his naturalism, his view of logic as contrasted with traditional logic, his view of experience, and his problem solving schema. The assumption is made that if a teacher is open to learning about and using Dewey's philosophy, then an understanding of these four areas can provide the basis for developing teaching strategies which conform to his theory.

Equally helpful to the teacher disposed towards teaching inquiry from a Deweyan perspective will be a comparison between Dewey's pragmatism and the philosophy of logical positivism. The author contends that often teachers employ inquiry teaching strategies which have a positivistic orientation rather than a Deweyan orientation. Dewey's pragmatism is often confused with logical positivism. Richard Bernstein points out, "It is still a popular myth,
even among philosophers, that positivism was a tough-minded variety of the more tender-minded and fuzzy pragmatism.\(^1\)

To deal with this problem, comparative analysis is used to ferret out the differences between logical positivism and Dewey's pragmatism. The endeavor is to bring out the sharp differences between the two philosophies to help assure that positivistic versions of inquiry are not mistaken for Deweyan versions. On this matter, Bernstein said, "What was then not clearly seen, and is today still barely recognized, is the deep antagonisms between logical positivism and pragmatism."\(^2\)

**Dewey's Naturalism**

The foundation of Dewey's theory of inquiry rests upon a naturalistic continuum. The propensity towards doing inquiry exists at birth, although is a most rudimentary way. Dewey feels that it is natural for man to inquire. Inquiry is as natural to man as his having opposite thumbs. Dewey said, "Tendencies toward a reflective and truly logical activity are native to the mind, and they show themselves


\(^2\)Ibid., p. 169.
at an early period, since they are demanded by outer conditions and stimulated by native curiosity.\textsuperscript{3}

Our biological traits provide the conditions for engaging in inquiry behavior. Man would be unable to engage in inquiry without the use of his biological characteristics. Dewey said,

It is obvious without argument that when men inquire they employ their eyes and ears, their hands and their brains. These organs, sensory, motor, or central, are biological. Hence, although biological operations are not sufficient conditions of inquiry, they are necessary conditions.\textsuperscript{4}

Man's biological traits continue with him throughout his life. Humans do not pass through and then out of a stage of biological development into a stage of intellectual development. The biological impetus of inquiry continues with man as he grows and develops. Continuity and stages of development are central themes in Dewey's naturalism. Similarly, continuity and stages of development are central themes in Dewey's educational philosophy. Appropriately, teachers should consider the developmental level of the learner. For example, algebra would not be


taught in the first grade. Ideas would be organized according to the various levels of their complexity. In short, learning material would be adapted to the developmental level of the individual. The learner would not be adapted to the material. Dewey also felt that as humans developed and evolved from infancy to adolescence, the opportunity for thinking more abstractly was enhanced.\(^5\) He said, "The mind at every stage of growth has its own logic."\(^6\) He emphasized this point by saying, "The only way in which a person can reach ability to make accurate definitions, penetrating classifications, and comprehensive generalizations is by thinking alertly and carefully on his present level."\(^7\)

The implication is that teachers have given to them pupils who are already in possession of the natural material for developing skills of inquiry. Therefore, a task of the teacher is to exploit this naturalism. One of the challenges of teaching, in Dewey's words, is, "The transformation of natural power into expert, tested power: the transformation of more or less casual curiosity and sporadic suggestion into attitudes of alert, cautious and

\(^5\) Ibid., pp. 88-89.

\(^6\) Dewey, *How We Think*, p. 83.

\(^7\) Ibid., p. 84.
thorough inquiry." Moreover, Dewey indicates that in every period of growth from childhood to adulthood the natural tendency to engage in inquiry is present.\(^9\)

It should be pointed out that the natural processes of inquiry are basically the same regardless of developmental level. A baby forms a hypothesis in the same manner as a scientist. The hypothesis developed by the baby and the hypothesis developed by the scientist function to guide inquiry. In essence, Dewey maintains there is not a difference of kind between the inquiry skills of a first grader and a philosophy professor. The difference is one of degree: the subject matter is more sophisticated; the generalizations are more abstract.

Dewey's contention that inquiry has a naturalistic foundation, and that human beings naturally possess it, does not mean the process will always be effectively used. Consequently, it is a task of the school to make students more efficient in their inquiring.\(^10\) An emphasis on the naturalistic foundation of inquiry has other ramifications. It established inquiry as a natural phenomenon; therefore, there is no natural reason why humans cannot do inquiry.

\(^8\) Ibid.
\(^9\) Ibid., p. 88.
\(^10\) Ibid., pp. 17-34.
Naturalism also establishes an evolutionary-organic view which suggests there are stages of development, and instruction should be matched to these stages.

**Naturalism and values.** Although exactly what Dewey meant by naturalism is difficult to pin down, it can be said that naturalism is not exclusively a biological characteristic of man. Dewey's naturalism has other significance. Dewey's naturalism lays the foundation for a humanistic values system, and it lays the foundation for Dewey's idealism. It is through this idealism that Dewey's values were often expressed. Dewey's idealism differs from traditional notions of idealism. Dewey's idealism deals with the natural world. The natural world is the world of human experience. Traditional philosophical idealism deals with a transcendent world. This world is an ideal world which exists independently of human experience. Dewey was at odds with philosophical idealism. He felt it turned its back on the world of human experience. On this point, David Marcell says, "Yet despite his diatribes against idealism as a metaphysic, Dewey consistently battled for idealism in practical morality and ethics. Metaphysical idealism, he felt, made such practical, experiential

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idealism impossible."\textsuperscript{12} It should be stated that naturalism implies that notions of what constitutes goodness arise out of human experience. In Abraham Kaplan's words,

\begin{quote}
Naturalism refers to the view that the ground of values is something in human experience and of a piece with everything else we experience--as contrasted with supernatural grounds like a divine commandment, or with nonnatural grounds like a unique quality of 'goodness' apprehended by a distinctive 'moral intuition.'\textsuperscript{13}
\end{quote}

Dewey thought that if man passively reclined and contemplated the ideal good, he would be less likely to bring it into the realm of human experience. Dewey thought that if notions of the good were unchanging and transcended man's natural existence, he did not have to develop ideas of goodness from his experience. Dewey said:

\begin{quote}
The thought that the values which are unstable and wavering in the world in which we live are eternally secure in a higher realm (which reason demonstrates but which we cannot experience), that all the goods which are defeated here are triumphant there, may give consolation to the depressed. But it does not change the existential situation in the least.\textsuperscript{14}
\end{quote}


\textsuperscript{14}Dewey, \textit{The Quest for Certainty}, p. 35.
A practical idealism asserts that humans can act on concrete experiential situations to bring about change. By using inquiry to process experience, it is possible the world could be made a better place in which to live. It was Dewey's idealistic hope that the use of inquiry would result in intelligent social beliefs. Dewey said,

If it is possible for persons to have their beliefs formed on the ground of evidence, procured by systematic and competent inquiry, nothing can be more disastrous socially than that the great majority of persons should have them formed by habit, accidents of circumstances, propaganda, personal and class bias.\(^\text{15}\)

In sum, Dewey's ethical naturalism reflects a belief in the corrigibility of human nature. It reflects a belief in the potential goodness of man. It reflects a belief in education as the vehicle for human betterment. Dewey's words were, "I believe that education is the fundamental method of social progress and reform."\(^\text{16}\) Consequently, teaching strategies derived from Dewey's theory of inquiry are expressions of a practical, naturalistic ethic. Accordingly, if a person's existing value framework falls within Dewey's naturalistic ethic, there will be a greater


likelihood for Dewey's theory of inquiry to be used as a basis for deriving inquiry teaching strategies.

\textbf{Dewey's Logic Compared to Traditional Logic}

The second major category to be considered in the explication of Dewey's theory of inquiry is his view of logic. The author maintains that an understanding of the central principles of traditional logic can be an important factor to an understanding of Dewey's logic. In fact, Dewey felt his logic was a marked improvement upon the traditional logic of rationalism.

\textbf{Rationalism.} The rationalistic view maintains that truth is established through the use of reasoning. The power of reason is exalted. Deductive reasoning, in particular, is celebrated. Reasoning is used to derive rational conclusions. For example, if \( A \) is greater than \( B \), then \( B \) is less than \( A \). This is a rational conclusion. It is a logical necessity, or as sometimes called, it is a necessary truth. In traditional logic, valid conclusions are based on sound reasoning from first principles. Dewey remarked, "The idea of reason as the power which intuitively apprehends
a priori ultimate first principles persists in logical philosophy."

In the rationalistic view, ideas are ideals. However, ideals are not naturalistic conceptions. Rationalistic ideals transcend human experience. Inquiry is not used upon experience to determine them. On the contrary, ideals exist as givens already determined. For example, the idea of justice is determined. As a rationalistic ideal, justice is invariant. Its meaning is not contingent upon experience. The meaning of justice is fixed and absolute.

In education, Dr. Robert M. Hutchins personified the rationalistic position. Hutchins believed that "the good, the true, and the beautiful" were to be found in the world's best books and that the best books were the classics. A good education consisted in knowledge of the classics. The good was determined. The good was fixed regardless of experiential circumstances. A classical education was good in the past, and it is equally good in the present.

The function of symbols in traditional logic. Traditional logic manipulates symbols so that rational assertions may be constructed. Therefore, the syllogism is an essential

tool of traditional logic. A syllogism is nothing more than the manipulation of language to achieve a valid conclusion. For example, if all men are mortal, and John is a man, John is mortal.

Traditional logic also deals with the symbolic meanings of language. Symbolic meanings imply other symbolic meanings. For example, smoke implies fire. Smoke implies friction. The fire and the friction exist by logical implication. Where there is smoke, there is fire. Fire is represented by smoke. The words or symbols provide no evidence of fire.\textsuperscript{18} The words are propositions. With propositions, implications are made. With propositions, the existence of fire can be implied. The existence of fire does not have to be observed.

Dewey's logic. Dewey's logic is based upon experience. It is based upon making inferences from experience. Dewey said, "There is danger that two things as logically unlike as inference and implication will be confused."\textsuperscript{19} Implications are made from propositions. Inferences are made from the events of experience. Therefore, an inference depends upon an actual existential event. For example, we can

\textsuperscript{18} Ibid., p. 52.

\textsuperscript{19} Ibid., p. 54.
infer that at the rate a fire is burning, it will reach our house. We cannot imply this. Dewey felt that traditional logic was based on symbols and implications from the symbols. His logic is based on experience and inferences from the experience.

The function of symbols in Dewey's logic. In Dewey's logic, symbols stand for inferences or concepts that are to be tested in experience to determine their validity. Symbols are used to represent thoughts or ideas. Symbols are used to represent possible courses of action. Symbolizations have reference to procedural features of inquiry. Propositions have an instrumental character: they lead to action.

The instrumental character of symbols. H. S. Thayer provides a useful example of the instrumental character of symbols. Thayer states,

Suppose we are inquiring into the problem of building a house. In the course of our inquiry, we make use of the concept, hammers and nails are necessary for the construction of wooden houses. This concept allows us to act. It aids in the actual building of the house.²⁰

Dewey illustrated the instrumental character of symbols with a commonplace occurrence. A person is walking along. Suddenly he feels cool air. He looks up at the sky.²⁰

He sees dark clouds, and soon he has an idea of rain. It is not yet raining, but through symbolization the idea of rain is represented. Rain is possible. The possibility is represented in the symbolization.\textsuperscript{21}

The possibility of rain suggests certain intelligent actions. We can procure our raincoats. We can procure our umbrellas. These suggestions are in the form of propositions which have an instrumental character. A relationship is established between dark clouds and cool air to formulate an idea of the possibility of rain.

Confusing words for experience. Dewey strongly criticized traditional logic for its contention that words were more important than experience. He said, "The whole classic tradition down to our day has continued to hold a slighting view of experience." Appropriately, it should be emphasized that words are not the experience. The tendency to confuse words for experience results in the acceptance of verbal statements for ideas. Consequently, in the classroom, a student writing down the idea is deemed to have conceptualized it. It was Dewey's hope that ideas would be operationalized in experience. For example, the concept, "People may put different meanings on the same word," should be

\textsuperscript{21}Dewey, \textit{How We Think}, pp. 9-10.
operationalized. Students could operationalize the concept by giving examples of it. The examples, of course, refer to an actual experience.

Dewey felt the symbolization of the concept tended to become more important than the experience of the actual operation of the concept. He said,

> Words, the counters for ideals, are, however, easily taken for ideas. And in just the degree in which mental activity is separated from active concern with the world, from doing something and connecting the doing with what is undergone, words, symbols, come to take the place of ideas.\(^\text{22}\)

Teachers tended to forget the concept, in its symbolic form, stood for or pointed to the actual operation of doing. For example, consider the concept, "Numerals are written symbols for quantity." Students might operationalize this concept by constructing their own symbol system. There is nothing innate about symbolizing the idea of sevenness by 7. Writing the concept, "Numerals are written symbols for quantity," is a symbolic representation of the concept, but it is not the concept. The symbolization of the concept should not be confused with the actual operation of the concept.

The role of deductive reasoning in Dewey's logic. It should be pointed out that Dewey's logic does not abandon the traditional logic of deductive reasoning. In fact, Dewey warns against the educational reformer who carries his objection too far against deduction. Dewey said, "A flat statement of a general principle may properly come at the beginning, provided it is used to challenge attention and not to close inquiry." In like manner, Dewey is critical of teachers who accept students' inductive inferences without testing and amplification.

In Dewey's logic, deduction works with induction. Students induct ideas, and use deduction to test them. It was Dewey's hope that the examples students gave would help them move into new facts and ideas. On the other hand, Dewey did not think this would be done if students mechanically gave examples and illustrations of the concept. He said,

Too often the student and teacher are contented with a series of somewhat perfunctory examples and illustrations, and the student is not forced to carry the principle that he has formulated over into further cases of his own experience. Insofar, the principle is inert and dead; it does not move into new facts or ideas.

23 Dewey, How We Think, p. 187.
24 Ibid.
25 Ibid., p. 186.
26 Ibid., p. 187.
27 Ibid.
Dewey's conception of meaning. With traditional logic, meaning is innate. Meaning is absolute, meaning is unchanging. With Dewey's logic, meaning is subject to change. However, meaning is not subjective. Meaning has an existential quality. It exists for others. Dewey said, "The particular existential sound or mark that stands for dog or justice in different cultures is arbitrary or conventional in the sense that although it has causes there are no reasons for it." Thus, the word dog does not make a dog a dog. What makes a dog a dog is a common acceptance of what is understood to be the case in experience. Meaning is, thus, social.

Some Teaching Implications of Dewey's Logic

Dewey's view of logic, as contrasted with the traditional logic, offers several suggestions for teaching strategies.

First, teaching strategies would include provisions for the testing of concepts. The testing of ideas is of paramount importance in Dewey's logic.

Second, learning activities that help to point out the difference between the word and the concept would be

part of the teacher's repertoire.

Third, the teacher would emphasize experience as the base from which to derive and test ideas. In short, the teacher would be aware of the difference between an appeal to experience and an appeal to reason in the rationalistic sense of reason.

Fourth, the teacher would not accept language alone as evidence of students' conceptualizing. Students would have to demonstrate concept behavior.

**Dewey's Views of Experience**

This writer believes the most critical element in Dewey's theory of inquiry to be Dewey's notions of experience. In fact, Richard Bernstein maintains that basic to an understanding of Dewey's definition of inquiry is an understanding of Dewey's notions of experience. To extend Bernstein's point, teaching strategies that make use of Dewey's theory of inquiry would be severely limited without an understanding of his ideas of experience. And as we shall see, Dewey's notion of problem solving is dependent upon situations being converted into reflective experiences.

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John Dewey believed that we learned from experience. All experience did not result in knowledge, but it was from experience we gained, however grudgingly, what knowledge we did have. Dewey said, "I assume that amid all uncertainties there is one permanent frame of reference: namely, the organic connection between education and personal experience."\(^{30}\)

After years of wrestling with a definition of experience, Dewey came to the conclusion that experience has only one "single definite use: that namely of calling attention to the fact that Existence has organism and environment as its aspects, and cannot be identified with either as an independent isolate."\(^{31}\)

Experience as transaction. Dewey views experience as a transaction between self and environment. The constituents of experience are the self and the environment mutually acting on each other. John Wynne stated, "Experience is always transitive having both a subject and an object. The individual is born, lives, and dies in the midst of persons and things. His continuous transactions with them


constitute the stream of his experience."  

In his earlier writings, Dewey used the word interaction. George Geiger points out the word interaction "assumes that some things have indeed been set apart, the problem now being to put them together again." Henry Miller points out, "Transaction connotes the mutual and the reciprocal." Darnell Rucker points out, "What had long been viewed as disparate ultimate entities, mind and world, self and environment, became two factors in a process, necessarily related through the process, neither having any existence independent of the other." George Herbert Mead offered, "The appearance of an organism capable of digesting grass brought into existence grass as food." Dewey and Bentley asked, "How can we have a principle without an agent, or a supply without a


36 Ibid.
Borrower cannot borrow without lender to lend, nor lender lend without borrower to borrow." The existence of one thing is dependent upon the existence of another.

Dewey and Bentley pointed out, "We can, of course, detach any portion of a transaction that we wish, and secure provisional descriptions and partial reports. But all this must be subject to the wider observation of the full process." The complexity of experience requires a transactional view. Ittelson and Kilpatrick offer the following example.

Consider our problem as that of understanding a baseball batter fully and in all his complexity. It is immediately apparent that the baseball batter does not exist independent of the pitcher. We cannot have a batter without a pitcher. It is true that someone can throw a ball up in the air and hit it with a bat, but his relationship to the batter in the baseball game is very slight. Similarly, there is no pitcher without a batter. The pitcher in the bull-pen is by no means the same as the pitcher in the game. But providing a pitcher for a batter is still not enough for us to be able to define and study our batter. The batter we are interested in does not exist outside of a baseball game, so that in order to study him completely we need not only pitcher, but catcher, fielders, teammates, officials, fans, and the rules of the game. Our batter, as we

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37 Dewey and Bentley, Knowing And The Known, p. 134.  
38 Ibid., p. 133.  
39 Ibid.
see him in this complex transaction, simply does not exist anywhere else independent of the transaction. The batter is what he is because of the baseball game in which he participates and, in turn, the baseball game itself is what it is because of the batter. Each one owes its existence to the fact of active participation with and through the other. If we change either one, we change the other.40

A transactional view of experience has practical, pedagogical implications. The learner is active. The learner is important. He is a dynamic part of the transaction. For instance, while reading a book a transaction occurs between reader and author. The reader makes judgments. The reader must decide which of his experiences are relevant to the story. In making such judgments, the reader looks for signals in the story that refer to his experience. Without the transaction between reader and author, the reader would be forced to deny his experience, he would be merely imprinted with the author's experience. What there is in the book to know is dependent upon the reader reading it. The reading of the book is a transaction. Dewey said:

Even if sounds on the moon, assuming the necessary physical and physiological waves, match Yankee Doodle in intensity, pitch, and timbre, they are not Yankee Doodle by "intrinsic

nature," in the twentieth century, whatever they might have been thought to be in the Dark Ages, or may perhaps be thought to be today by echo-istic survivals of those days; they need action if they are to yankeedoodle at all.41

Israel Scheffler points out the significance of a transactional view. Scheffler states, "The process of learning from experience was an active process for the pragmatist. The mind was conceived neither as a deep well of necessary truths nor as a blank slate upon which experience writes."42

In a transactional view of experience, the environment does not simply, but forcefully, impress knowledge upon the individual. The learner is active. He reconstructs his experience: he develops ideas from his experience. Through a reconstruction of experience, the learner attempts to understand his present experience in the light of his past experiences. Ideas gained from previous experiences are used to solve problems in our present experience or to help us understand and make sense out of present experience. Through reconstruction, the meaning of our present experience is enriched; our perceptions are increased. We are able to

41 Dewey and Bentley, Knowing And The Known, p. 134.

put more things together. In sum, reconstruction is that aspect of Dewey's theory that asserts that previous ideas gained through the use of inquiry upon past experience can now be transferred to our present experience. Transference is important. It is a form of reconstruction. If in the past we have learned how to fix a flat tire and our tire is now flat, we should be able to fix it. If in the past we have learned that people generally smile when they are happy, a smile on a face makes sense to us. If the smile is deceptive, we have to construct a new concept. In any event, we are still searching for meaning.

The important point to be made is that inquiry is the method of deriving meaning from experience. Although it has become identified as such, inquiry is not merely a method of problem solving. Inquiry is more extensive than a logic of problem solving. Inquiry is the method of processing experience. A person can be reflective with his experience even when not necessarily confronted with a specific or a pressing problem.

Richard Bernstein asserts, "There are two frequent misinterpretations of Dewey that can be easily corrected here: the claim that according to Dewey we only think when we must; and that the only occasion for thinking is the
occurrence of a practical difficulty.\textsuperscript{43} The implication for teachers is that students can be reflective about their experiences and not necessarily be confronted with a problem.

The having and the knowing experience. Dewey specified two phases of experience. There was the having, and there was the knowing experience. The having experience was the nonreflective experience. The nonreflective experience made up the better part of experience. Bernstein said, "When Dewey speaks of 'nonreflective' or 'noncognitive' experiences, he means any type of experience in which knowing or inquiry is not the primary concern."\textsuperscript{44} Dewey wrote:

Consideration of method may suitably begin with the contrast between gross, macroscopic, crude subject matters in primary experience and the refined, derived objects of reflection. The distinction is one between what is experienced as the result of a minimum of incidental reflection and what is experienced in consequence of continued and regulated reflective inquiry. For derived and refined products are experienced only because of the intervention of systematic thinking.\textsuperscript{45}

\textsuperscript{43} Bernstein, \textit{John Dewey}, p. 105.

\textsuperscript{44} Ibid., pp. 61-62.

Having an experience lays the groundwork for a knowing experience. The having experience is the immediate experience. Using our vision, we can have the immediate experience of color. From having this immediate experience, the groundwork for shifting into a knowing experience is established: we can, if we desire, investigate the nature of color. From investigation, we can learn about optical physics. The having experience has the potential to be transformed into a knowing experience. The use of inquiry transforms the having experience into a knowing experience.

Having an experience is important, but merely having an experience does not result in knowing. For example, a person can have the experience of playing chess. The mere experience of chess playing is not enough to develop chess skills. It is only when there is reflection upon the chess playing experience that there will be developed chess skills.

It could be observed that a certain opening move allowed the bishops to be developed. A relationship is developed which states that in beginning a game of chess it is wise to make certain moves to develop the bishops. The ability to make this relationship is an essential part of inquiry. If this were just a having experience, inquiry would not be used, and relationships would not be developed.
In a having experience, chess pieces would be pushed, and the next time one played he would begin the game arbitrarily: he would not make an opening that would allow the bishops to be developed. There would not be any concept developed that would allow for continuity from one experience to the other. A concept can be transferable. It can be used again in a new but similar experience, such as another chess game. Obviously, the principle of continuity can only be undertaken when there are concepts to transfer or when there has been a knowing experience. In fact, a developed concept is evidence that the experience has been a knowing experience.

Dewey makes two important points. First, he asserts that the development of concepts is an indication that reflection has occurred and that there is knowledge. Second, he equates knowing with doing. For instance, knowing the rules of chess is not the same as knowing how to play chess skillfully. Obviously, knowing the rules of chess is knowledge of a kind. However, in the final analysis, to quote Dewey, "There is no such thing as genuine knowledge and fruitful understanding except as the offspring of doing." 46

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Dewey essentially takes the epistemological position that knowledge can be defined in terms of using inquiry upon the having experience. His writings strongly reflect this position. Examination of his writings finds that he has said, "Knowledge is to be defined in terms of inquiry." 47

Any statement that is or can be made about a knower, self, mind, or subject—or about a known thing, an object, or a cosmos—must so far as we are concerned, be made on the basis, and in terms, of aspects of event which inquiry, as itself a cosmic event, finds taking place. 48

Dewey's view of experience contrasted with the orthodox view. Dewey's contention that knowledge can be defined in terms of using inquiry upon experience is a departure from the orthodox view of experience. The philosopher John Locke represents the orthodox view. To Locke, the mind was conceived as a blank slate upon which experience wrote. The experience itself results in knowing. However, Dewey feels the orthodox view is an inadequate account of experience. For example, take the simple situation of an optical illusion. Upon immediate apprehension, a stick immersed in a glass of water appears to be bent. We cannot know whether

48 Dewey and Bentley, Knowing And The Known, p. 121.
the stick is bent merely by having the experience of perceiving it. In fact, if we went by the perceptual experience alone, we would think the stick was bent.

Dewey held that knowledge was not due to experience alone. He felt our knowledge was mediated. We did something to experience. In our example, we take the stick out of the water. In doing so, we find out the stick is not bent. Dewey hoped we would take an active role in structuring our experience. He hoped we would process our experience. If we were not actively involved with our experience, Locke would be correct; having an experience would result in knowledge.

Abraham Kaplan adds further clarification. He points out, "There is an empiricist tradition, from Hume through Mill to Russell, in which a distinction is made between 'hard' and 'soft' data, according to whether they are purely observational or contain an inferential element."49 Kaplan further points out, "Nietzsche's label for this philosophical doctrine is not, I think, unjust; he called it 'the dogma of immaculate perception.'"50

49 Kaplan, The Conduct of Inquiry, p. 131.
50 Ibid.
Essentially, in the orthodox empirical tradition, people do nothing but perceive a factual condition. It is the facts that give us truth. Schwab points out, "This conception rests on a premise very like that of rationalism, that 'facts' carry their own self-evidence guarantee and convey the same conclusion to all men." Educationally, this theory results in a desire to "rub the learner's nose in the facts." The philosopher Bertrand Russell personified the orthodox, empirical position. Russell once asserted, "Nevertheless it is plain, also, that the truth or falsehood of a given judgment depends in no way upon the person judging, but solely upon the facts about which he judges."

In Dewey's view, a human being is actively making inferences from his experiences. An inference is mediated knowledge; it is not immediate knowledge. Making an inference is a vital function of inquiry. We are able to go beyond information to make a warranted assertion. We make inferences from what we experience. Data arouses suggestions. Dewey pointed out, "But the suggestions run beyond

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52 Ibid.
what is, as yet, actually given in experience. They forecast possible results, things to do, not facts (things already done). Inference is always an invasion of the unknown, a leap from the known.  

In the orthodox view of experience, apprehension of a thing is confused with comprehension of it. In Dewey's view, apprehending an object does not constitute all there is to know about it. To explain, we can directly perceive that water is water. We are at the recognition level of experience. There are many levels of experience. We use inquiry to realize these many levels. We can go beyond the recognition of water. Further investigation may result in revealing the chemical properties of water. This would be a comprehension, an understanding, of water. Dewey would be wont to call the perceptual level of experience a knowing experience. Apprehending the appearance of the water is not a separate experience from understanding its chemical makeup. Apprehending is a phase of experience. As George Geiger points out, "Experience is an affair of having as well as of knowing." 

We are able to go from one phase to the other, from having to knowing. Dewey is

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54 Dewey, Democracy and Education, p. 158.
essentially saying there is more to an experience than meets the eye.

Dewey did not deny that there was some thinking in all experiences. He did feel, however, that knowing or inquiry was not the primary concern of all experiences. On this matter, Bernstein states:

Anyone who recognizes the differences between an experiencing of quenching thirst where the perception of water is a mere incident and an experience of water where knowledge of what is, is the controlling interest; or between the enjoyment of social converse among friends and a study deliberately made of the character of the participants; between aesthetic appreciation of a picture and an examination by a connoisseur to establish the artist recognizes the difference between non-cognitive or nonreflective experiences and experiences in which knowledge is primary.56

H. S. Thayer contends Dewey did not break with the traditional empirical view of experience. Thayer feels Dewey overhauled it.57 Thayer points out that the result was, "Instead of experience being the stuff from which ideas are derived, it became a way in which ideas have a function and their significance is elicited."58 "In short, experience became experimental."59 Dewey's overhauling of

58 Ibid.
59 Ibid.
experience resulted in a shift from the antecedent view of experience to a consequential view. The consequences of ideas become of greater interest than their origins. Thus, ideas become instruments for experimentation. The interest is in what will happen to experience if we use our ideas to undertake this or that course of action.

Inquiry is the experimental method of experience. We use the method to construct an idea from experience. We use the method to test the significance of an idea in experience. However, we do not experiment merely to find out the truth or falsity of an idea. We also test ideas to find out what they could mean in experience. We test to find out their consequences, their social significance.

Dewey felt the origins of ideas were the focus of the orthodox view of experience. In Dewey's view of experience, ideas are not revered because they have glorious antecedents or are lovable traditions. We examine ideas in terms of their actual consequences in experience. We are not anchored into past experiences. People are free to experiment with experience and try new ideas. Significantly, whenever we are dealing with consequences we are dealing with possibilities. Possibilities imply the opportunity to experiment.
An illustration from the area of law is used to demonstrate the experimental view of experience as it contrasts with the more orthodox view. In 1894, a man was arrested on the charge of employing women more than eight hours a day. An Illinois statute provided that females working more than eight hours a day was illegal. The Supreme Court of Illinois ruled the statute unconstitutional. Precedent and formal reasoning were invoked. Liberty of contract was deemed an important right. It was argued that this statute was a violation of that right. Therefore, this statute was unconstitutional.

Fifteen years passed. The same man was arrested for violating a similar law, a ten hour work law. The same argument of liberty of contract was raised. This time, however, there was a different judge with a different view of experience. Rather than consider antecedents, this judge turned to the consequences of experience. The consequences of a ten hour work day indicated the health of women to be placed in peril by the long hours of work. Therefore, this judge decided liberty of contract would have to be redefined in the light of new experience. Limits on the right of contract could be set.  

Dewey does not assert that we should experiment for experiment's sake. Random activity is not inquiry. Inquiry had to be purposeful. Dewey pointed out,

To run against a hard and painful stone was not of itself an act of knowing. However, if running into a hard and painful thing was an outcome predicted after one inspected data and constructed a hypothesis, then the hardness and painful bruise which defined the thing as stone also constituted it emphatically as an object of knowledge.61

In essence, when we experiment we have a purpose in mind. We have ideas to guide us.

The orthodox view holds that experience can tell us what is and what has been. It cannot tell us what ought to be.62 Therefore, prescriptions are impossible. Dewey, of course, rejected the dualism between the is and the ought. Dewey's position was that inferences can be made from experience to aid us in deciding what to do. We can use experience experimentally. We can test our inferences against experience. We can test what we ought to do against experience. The experimental method was not separated from normative behavior. Whenever humans were experimental, they were engaged in moral behavior. They were maintaining they ought to try this, or they ought to try that.

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This value issue will be addressed in more detail in the comparison of positivism with pragmatism. For present purposes, it is important to point out that it was Dewey's hope that human beings would develop an experimental attitude towards experience. It was Dewey's hope that the experimental attitude would be developed in our schools. The experimental attitude provides the normative basis for the cognitive skills of inquiry. The skills of classifying and the skills of inferencing work in conjunction with attitudes of openness and tolerance. The skills and the values of inquiry function together. The cognitive skills of inquiry and the values of inquiry are not separate and distinct modes of experience.

Teaching Implications of Dewey's Views of Experience

Based on Dewey's views of experience, several points pertinent to the development of teaching strategies can be made. First, transference can become an integral part of teaching. Teachers could allow for a reconstruction of students' experiences. Teachers could provide opportunities for students to transfer ideas into the classroom that have been developed from previous experiences. This could be accomplished by asking students to give examples from their experience of the concepts being studied in class.
Second, by having students develop and test concepts, a having experience could be transformed into a knowing experience. For example, if a group of seventh graders are preparing to go on a field trip to a glass factory, inquiry could be used to help them make sense out of the experience. Concepts for the students to test could be provided by the teacher. In addition, the teacher could ask the students to induct their own concepts from the experience.

The field trip experience would be more than a having experience. If used in conjunction with inquiry, a field trip can become a knowing experience. If inquiry is not used, reflection is left to chance, and it is assumed that the experience itself will lead to knowing.

Third, teachers would work on the distinction between observing and inferring. They would work on students developing the ability to construct inferences from an observation or a set of observations. The notion of the individual actively reconstructing his experiences, and making inferences, is paramount.

Fourth, keeping the inquiry value of openness in mind, teachers would work on students developing the ability to realize that inferences may need to be revised on the basis of additional observations. Strategies to develop an experimental attitude would, therefore, be implemented.
Finally, knowing can occur outside of school. The ubiquity of experience is recognized. However, a student would not receive credits for merely having an experience. Evidence of the development and the use of concepts would have to be established.

**Dewey's Problem Solving Schema**

Dewey's problem solving schema could be included within the section pertaining to his views of logic. His problem solving schema constituted the central part of his logic of inquiry. Given that the problem solving process was such an important part of Dewey's logic, it is considered in its own right. Dewey's problem solving notions helped to establish his epistemology.

Dewey gave two definitions of inquiry. In one definition, inquiry was simply equated with knowing. In the other definition, his most famous one, inquiry and knowing were put in the context of a problem situation. In this definition, Dewey said, "Inquiry is the controlled or directed transformation of an indeterminate situation into one that is so determinate in its constituent distinctions and relations as to convert the elements of the original

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63 Dewey and Bentley, *Knowing and the Known*, p. 295.
Suppose you are walking where there is no regular path. As long as everything goes smoothly, you do not have to think about your walking; your already formed habit takes care of it. Suddenly you find a ditch in your way. You think you will jump it (supposition, plan); but to make sure, you survey it with your eyes (observation), and you find that it is pretty wide and that the bank on the other side is slippery (facts, data). You then wonder if the ditch may not be narrower somewhere else (idea), and you look up and down the stream (observation), to see how matters stand (test of idea by observation). You do not find any good place and so are thrown back upon forming a new plan. As you are casting about, you discover a log (fact again). You ask yourself whether you could not haul that to the ditch and get it across the ditch to use as a bridge (idea again). You judge that idea is worth trying, and so you get the log and manage to put it in place and walk across (test and confirmation by overt action).  

Ultimately, it was Dewey's hope that we would develop an experimental attitude, that we would actively seek problems. Our problems would not have to be practical ones staring us in the face. On the contrary, our intellectual curiosity would lead us to problems which in turn would lead us to use inquiry to solve them.

65 Dewey, How We Think, p. 105.
Peirce's contribution. Charles S. Peirce, Dewey's former teacher, should be credited with presenting the problem situation as the catalyst to thought. Peirce said, "The irritation of doubt causes a struggle to attain a state of belief. I shall term this struggle inquiry, though it must be admitted that this is sometimes not a very apt designation." Peirce thought that, among other things, man is a biological organism. All organisms seek a state of equilibrium. Problems upset this state; therefore, problems must be resolved. The best method of resolution is the method of inquiry.

In Peirce's view, truth would be settled by a community of inquirers. It would be agreed upon by all those who investigate the problem. In such a view, the public testing of ideas is all important. On this matter, Frederick A. Olafson states, "Inquiry offers its tentative conclusions for general evaluation, and it is accepted that the milieu of experience in which this evaluation is to be carried out is that of everyman." Truth for Peirce was


objective. It was objective in the sense that ideas are open to public verification and testing.

Dewey was in accord with Peirce's view of truth. In fact, he said,

The best definition of truth from the logical standpoint which is known to me is that of Peirce: The opinion which is fated to be ultimately agreed to by all who investigate is what we mean by the truth, and the object represented by this opinion is the real.\textsuperscript{69}

The phases of thinking behavior. If the method of inquiry is used to solve a problem, various phases of cognitive behavior may be represented. According to Dewey, these phases were:

(1) suggestions, in which the mind leaps forward to a possible solution; (2) an intellectualization of the difficulty or perplexity that has been felt (directly experienced) into a problem to be solved, a question for which the answer must be sought; (3) the use of one suggestion after another as a leading idea or hypothesis, to initiate and guide observation and other operations in collection of factual material; (4) the mental elaboration of the idea or supposition as an idea or supposition (reasoning, in the sense in which reasoning is a part, not the whole, of inference); and (5) testing the hypothesis by overt or imaginative action.\textsuperscript{70}

These phases were not lock step. The process could be entered at phase three or phase four. Dewey warned about falling into a lock step approach. He said, "The five

\textsuperscript{69}Dewey, Logic: The Theory of Inquiry, p. 345.

\textsuperscript{70}Dewey, How We Think, p. 107.
phases, terminals, or functions of thought do not follow one another in set order."\textsuperscript{71} William C. Merwin points out, Dewey did not try to establish a fixed series of consecutive steps involved in thinking. Rather than learn a formula for thinking, he proffered that a learner should develop the 'intellectual tact and sensitiveness' to solve problems by inquiring constantly in the classroom.\textsuperscript{72}

Merwin states, "This process, consisting of five phases (suggestion, intellectualization, hypothesis, reasoning and action), was to be employed as a classroom teaching method as well as an instructional goal."\textsuperscript{73}

Bernstein stated about Dewey's method of problem solving,

It is descriptive insofar as it is concerned with the ways in which men actually do inquire; it is normative because the aim is to isolate, appraise and evaluate those norms and standards that are most successful in achieving warranted knowledge claims.\textsuperscript{74}

The problem situation. An experiential situation is indeterminate. We are doubtful because the situation is doubtful. Problems are not solely the creation of the private mental events of an inner self. Therefore, to

\textsuperscript{71}Ibid., p. 115.


\textsuperscript{73}Ibid.

\textsuperscript{74}Bernstein, John Dewey, p. 102.
solve a problem, an experiential situation must be considered. Without a consideration of the experiential situation, the problem cannot be solved. Problems are viewed transactionally. There is a problem situation and there is a human being. Dewey put it this way: "The farmer will not get the grain unless he plants and tills." The tilling and the planting are not private mental events. They are events performed in experience by the farmer.

George Geiger points out, "Problems can be of all kinds and occur in all dimensions." For example, investigation into why some cities grow industrially and others do not can be considered a problem. There is an indeterminate situation. It is not determined why one city grows and the other does not.

The problem situation and the teacher. It should be pointed out that a problem situation will not automatically stimulate thinking. Merely giving students a problem and hoping for the best is not the best procedure for teaching inquiry. Some students may choose to solve the problem by flipping a coin. Accordingly, an important task for the

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teacher would be to teach problem solving skills and attitudes.

Dewey realized that it was important for students to formulate their own problems. On the other hand, he recognized that schools do give problems to students. Dewey stated, "The giving of problems, the putting of questions, the assigning of tasks, the magnifying of difficulties, is a large part of school work."\(^7\)

Dewey's concern was that teachers would discriminate between genuine and simulated problems. Dewey postulated two guidelines to assist teachers: (1) Does the problem have a relation to the student's personal experience? (2) Will the problem lead to inference and its testing?\(^8\)

In consequence, problem situations can be of the student's formulation, or they can be of the teacher's. The connection to experience rather than the origination of the problem is what is of significance. It should also be pointed out that Dewey felt problems naturally suggested themselves from outside of the school experience. These problems could be used by the teacher as appropriate subjects for inquiry. In short, community problems are fit subjects for inquiry.

\(^7\) Dewey, *Democracy and Education*, pp. 154-155.

\(^8\) Ibid., p. 155.
Warranted assertions. The solving of a problem results in knowledge or belief. Dewey preferred the term "warranted assertion" to knowledge or belief. He stated, "It is free from the ambiguity of these latter terms, and it involves reference to inquiry as that which warrants assertion."\(^{79}\) In Dewey's view, ideas are tested to determine if they qualify as warranted assertions. There are, of course, problem situations in which it is impossible to test an idea for its warranted assertability. When confronted with such a situation, Dewey's advice was to be aware of those beliefs that rest on tested evidence and those that do not.\(^{80}\)

The objectives of problem solving. Although solving problems was important, Dewey did not think the ends of inquiry consisted in solving problems. Inquiry was more than solving problems. Inquiry was a means to the nobler ends of human growth. Dewey said, "Growth itself is the only moral end."\(^{81}\)

H. S. Thayer states,

Inquiry is a sign and condition of human growth. It was not surprising that Dewey should find in inquiry the possibilities for a genuine religious outlook--one wanting only in imaginative projection of the essentially communal


\(^{80}\)Dewey, *How We Think*, p. 98.

function of inquiry and its premium on socially shared experience.82

Possible Teaching Implications

Several points can be made pertinent to problem solving and teaching strategies. First, there would be teaching strategies by which students would be taught the logic of problem solving. However, it would follow that the logic of problem solving would not have to be taught sequentially. Second, it is within Dewey's theory for the teacher to give a student a problem. However, the problem should relate to the student's experience. Third, strategies to have students develop an awareness of problems should be developed. Obviously, the first phase in problem solving is becoming aware that there is a problem. Fourth, teachers could develop teaching strategies that would have students develop the ability to distinguish beliefs that rest on tested evidence and those that do not. The social-public nature of inquiry could be stressed. Fifth, teachers could have students work on developing attitudes of inquiry, especially viewing ideas as warranted assertions rather than as dogmatic assertions.

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82 Thayer, Meaning and Action, p. 142.
Logical Positivism and Dewey's Pragmatism

The purpose of this next section is to compare logical positivism with Dewey's pragmatism. Both are empirical philosophies. Simply put, both contend that knowledge comes from experience. Richard Bernstein even contends that positivism found a congenial home in America to a large extent because of the influence of John Dewey. Bernstein feels that this philosophical companionship resulted in a blurring of the significant differences between the two philosophies. Bernstein contends that the idea that positivism was not only compatible with Dewey's pragmatism but a further development of his position still obtains. Consequently, positivistic conceptions of inquiry are often confused as being Deweyan. Accordingly, this section will focus on the major differences between positivism and Dewey's pragmatism.

Logical Positivism

Contemporary logical positivism is identified with a group of philosophers who gathered in Vienna in the 1920's. They were labeled the Vienna Circle. Harry Broudy points out:

The circle dedicated itself to (a) showing that all human knowledge is built up out of the data of experience, especially sense experience, (b) that propositions that could not be reduced to statements about observable items in experience were both literally and figuratively nonsense, i.e. meaningless, and (c) philosophy that talked about nonobservables was to be dismissed as disguised expressions of wishes rather than as description of anything.\(^{84}\)

Richard Bernstein states,

Basically, the positivist temper recognizes only two models for legitimate knowledge: the empirical or natural sciences, and the formal disciplines such as logic and mathematics. Anything which cannot be reduced to these, or cannot satisfy the severe standards set by these disciplines, is to be viewed with suspicion.\(^{85}\)

**Positivism Compared with Dewey's Pragmatism**

Transaction. Positivists claim there is an objective world existing independently of human transaction. Dewey would agree there is an external world of "brute facts" given through experience. However, he feels this world does not have much character or meaning independent of human transaction. On this matter, Dewey and Bentley said:


A 'real world' that has no knower to know it, so far as human inquiry is concerned (and this is all that concerns us), has just about the same 'reality' that has the palace that in Xanadu Kubla Kahn decreed. (That, indeed, has had its reality, but it was not a reality beyond poetry, but in and of it.) A knower without anything to know has perhaps even less claim to reality than that.  

Positivism does not have a transactional view of experience. It clings to a dualistic view of experience. Reality is assumed to be an objective world with an already formed character. Dewey, of course, viewed experience as a transaction. This so called objective world is but one part of the process of transaction. The other part, a human being, is equally significant. This significance is denied by positivism.

Reductionism. The positivist takes a reductionist view of experience. The abstract can be reduced, and should be reduced, to the concrete. The abstract can be reduced to the immediate world around us. Hans Reichenbach points out that the immediate world of the positivist can be reduced to a world of nothing but sense data. For example, a stove can be reduced to hot. Hot is sense data. A flower can be

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86 Dewey and Bentley, Knowing and the Known, p. 136.
reduced to blue. Blue is sense data. The positivist contends that if ideas cannot be reduced to their basic elements, they have no basis in an objective world. The implication is that abstractions are without existence, or at the very least are nonsensical.

Dewey, on the other hand, was not a reductionist. He felt that abstractions were real. Abstractions had existence. Notions of justice were just as real as hot stoves. For the pragmatist, experience consisted of irreducible, but objective, abstractions. Reichenbach felt that a belief in objective abstractions that are irreducible distinguished the pragmatist from the positivist.

Objective abstractions. Dewey was critical of positivism's refusal to deal with objective abstractions. He said about positivism, "Its logic has no recognized place for hypotheses which at a given time outrun the scope of already determined 'facts,' and which, indeed, may not be capable of verification at the time or of direct factual verification at any time."^8^9


^8^8 Ibid., p. 162.

Abstract does not mean without existence. The educational philosopher P. L. Smith asks, "Are there irreducible abstract qualities of nature that are not creations of mind, or mere figments of the imagination, but instead represent objective realities?"

Objective abstractions are natural. They are derived from the experiences of human transactions. They are abstractions in that they cannot be ultimately reduced with any meaning to sense data, or reduced with any meaning apart from their relationship to other experiential things. For example, to have meaning, hot is related to stove. Blue is related to flower. Justice is related to society. Abstractions are objective in that they cannot be isolated from human experience. The connections are made in this world, and the connections made do not have meaning outside of human experience.

Things are not given in experience as isolated elements. Dewey said, "Honesty, chastity, malice, peevishness, courage, triviality, industry, irresponsibility are not private possessions of a person. They are working adaptations of personal capacities with environing forces."

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90 Philip L. Smith, Sources of Progressive Thought in American Education (Columbus, Ohio: By the Author, The Ohio State University, 1977), p. 105.

The ideas mentioned represent objective abstractions. They exist in human experience. In Dewey's view, they have a base in an objective-natural world. Ideas are very real. Ideas have existence in human experience. Unlike the positivist, Dewey felt abstractions do have an irreducible existence in human experience. These abstractions are objective. They affect the lives of human beings. They guide human behavior. Objective abstractions have consequences in experience.

A comparison of the purpose of inquiry. Positivism was interested in using the method of inquiry to establish the truth or the falsity of an idea. Dewey felt that positivism had a tendency to view ideas as either true or false. He said, "Popular positivism, in spite of its claims to be strictly scientific, has been in some respects the heir of an older metaphysical view which attributed to ideas inherent truth-falsity properties." Dewey felt that the method of inquiry could be used to establish the warranted assertability of an idea. Dewey did not view ideas as being either true or false. Warranted assertability suggested that the truth of an idea was a probable and a tentative truth, not an inherent truth. This required a

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different temperament from positivism. In this respect, there is a significant attitudinal difference between positivism and Dewey's pragmatism.

Positivism maintains that since the objective world is already formed, inquiry is to be used to discover the laws and principles of the objective world. On the other hand, the pragmatist is not primarily interested in inquiry to acquire knowledge about an objective world. Pragmatism is interested in the part inquiry plays in developing the capacity for man to think, and for man to experience human emotions. Dewey felt that the method of inquiry had value implications as well as epistemological implications. Dewey felt that there was a normative basis to inquiry. Positivism does not have this view of inquiry.

The Issue of Values

Dewey thought that the subject matter of scientific judgments and the subject matter of moral judgments were the same. He said, "I hold that one and the same method is to be used in determination of physical judgment and the

\[93\text{Smith, Sources of Progressive Thought, p. 98.}\]
\[94\text{Ibid., p. 100.}\]
value-judgments of morals."\(^{95}\) Positivism does not hold to this view. Robert E. Mason points out, "The positivists and analysts resist moral imposition sanctified by the claim to absolute truth but they, it seems, would allow a naked power struggle to determine moral standards, denying the possibility of rational establishment of grounds of acceptability."\(^{96}\)

Dewey believed values had an experiential base and were subject to the process of inquiry. Ideas of good, or of bad, are directly experienced. Positivism contends that values are subjective. People, therefore, can believe anything they want as long as they are logical and do not contradict themselves. Values are outside the domain of inquiry. Mason says about the logical positivists, "In their overwhelming concern about clarity, internal consistency, and logical rigor, they place the ethical outside the domain of intellectual method."\(^ {97}\) Unlike Dewey's pragmatism, positivism does not have an empirical conception of


\(^{97}\) Ibid., p. 50.
morality. Moral positions can be logical, that is not contradictory, but they cannot be empirical. Dewey, of course, felt the idea of justice to be just as objective as the idea of gravity. The meaning of gravity is hammered out of human experience. Conceptions of justice are hammered out of human experience.

The Influence of Positivism

The influence of positivism has been felt in many areas. It is Richard Bernstein's contention that positivism dominates the thinking of what he terms "mainstream social science." Bernstein says,

By 'mainstream social scientists' I mean those who conceive of their discipline as one that differs in degree and not in kind from the well established natural sciences, and who are convinced that the greatest success is to be found in emulating, modifying, and adapting techniques that have proven successful in our scientific understanding of nature.  

If positivism has penetrated the social sciences, it is reasonable to believe that positivism has infiltrated education and has influenced attempts at inquiry teaching. In fact, carrying the positivistic banner into education has been one of the leading contemporary advocates of inquiry teaching, Edwin Fenton. In the mid-1960's Fenton gained

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prominence for developing social studies projects with an emphasis on inquiry thinking skills. In discussing these projects, Fenton sounds much like Bernstein's description of the mainstream social scientist. Fenton states, "The social studies projects devote much of their efforts to teaching the rules by which social scientists verify, modify, or reject hypotheses." 99

M. J. Max van Manen states that Fenton's position is similar to the other leading models of inquiry teaching. He feels that the concept of inquiry teaching should have a broader epistemological base than is currently practiced. He is suggesting that Fenton is not positivistic enough, and he is suggesting that the leading models of inquiry teaching are not positivistic enough. Present inquiry models, in Max van Manen's estimation, need to more adequately reflect "the true nature and inquiry patterns of the everyday practices of scientists." 100

The important point to be stressed is that the positivistic scientific model rather than the extensive philosophical orientation of John Dewey became the model for inquiry. In fact, Bernstein feels positivism is one of the,


if not the, dominant philosophies in Western intellectual circles.\textsuperscript{101} If such is the case, we could expect to continue to have positivistic influences on inquiry teaching and we could expect to have even less attention paid to the philosophy of John Dewey.

In fairness to Fenton, he was aware of Dewey's analysis of the process of reflective thinking. The problem is that Fenton does not view the process of reflective thinking in the context of Dewey's total philosophy. His model of inquiry is a positivistic one. If Dewey's five phases of reflective thinking are taken in isolation from the rest of his philosophy, we have a positivistic position. Dewey, obviously, would agree with an emphasis on scientific method as the best procedure to knowing and to learning. On the other hand, Dewey linked the method of inquiry to other related philosophical concerns, such as a view of experience, notions of value, and the role of deduction.

\textbf{Summary and Teaching Implications}

In essence, positivism does not have a transactional view of experience. Positivism clings to a dualistic view of experience. In a positivistic view of experience, a

\textsuperscript{101}Bernstein, \textit{John Dewey}, pp. 167-172.
separation is made between the problem and the student's experience. The problem and the student's experience are viewed as distinct entities. Connecting a problem to the experience of a student is not a concern of positivism. In fact, there is not any philosophical basis to do so. The experience of the learner is deemed to be not as important as the facts of the objective world which exists independently of the learner's experience.

In Dewey's view, attempts are made by the teacher to connect problems to the experiences of students. The principle of transaction is not neglected. Students are provided the opportunity to perceive how problems take on meaning when they become part of the student's experience. Students are, thus, provided the opportunity to identify with problems.

In Dewey's view, abstractions would not be reduced. Abstractions affect our lives. Ideas have consequences. Teachers would, therefore, provide opportunities for students to ponder the consequences of ideas. It would be important for students to develop an appreciation of the significance of the function of abstractions in human experience.

A positivist educator is a reductionist. Measurement is important. Measurement is quantitative. Intelligence
and aptitude can be measured. Therefore, the person who scores high on an admission test to law school should be admitted. In contrast, Dewey would take into consideration other traits less measurable. For example, perseverance and a sense of justice are objective abstractions worthy of consideration. They are not, however, quantifiable units of measurement.

The Philosophy and the Theory Synthesized

We can say that inquiry is not a logic. It is a theory and a philosophy that includes a logic. It is used to solve problems. It is used to process experience. It is used to derive meaning. It is used to develop concepts. It is used to test concepts. It is an outlook on life. It has its own moral code. It includes being open and public, viewing life experimentally, not being absolutist. Inquiry is an attitude that does not accept a closed authority. It is an attitude that is willing to change with new data. It is an attitude that stresses cooperation and sharing. It is an attitude that seeks and respects evidence, but is aware that abstractions are as real as the stones on the ground, and just as natural.

Inquiry is a view of the use of the scientific method that respects symbolic thought. It realizes that thinking
is made possible by the use of symbols, but the symbols are concept statements that need to be tested in experience. Inquiry views the method of science as not being confined to a particular discipline such as biology or physics. Inquiry is a general method of knowing and making sense out of experience that cuts across all boundaries of disciplines. It is a way of trying to view social problems personally. It is a philosophy that acknowledges both society and the individual. The individual structures his experience, but what is structured is subject to a public test. With the use of inquiry, distinctions are not made between the is and the ought. The is and the ought of life do not belong to two different worlds. In essence, the inquiry temperament does not accept a dualistic view of life. The many facets of our experience transact with each other. Our job is to make connections of one experience to another experience, and thereby, as human beings, to grow and expand.

Finally, inquiry is prescriptive as well as descriptive. Steven Cahn points out that this distinguishes Dewey from contemporary philosophy. In this regard, Cahn quotes the British philosopher Gilbert Ryle. Ryle said, "I have no teaching tricks or pedagogic maxims to impart.
to you, and I should not impart them to you if I had any."\textsuperscript{102}

Cahn points out that Dewey would not agree with Ryle's position. Cahn states, "Dewey after all, believed that one of philosophy's crucial tasks is 'the search for values to be secured and shared by all,' and that is precisely the search eschewed by the makers of the British philosophical revolution."\textsuperscript{103}


\textsuperscript{103}Tbid.
CHAPTER IV
TWO SIGNIFICANT PAST ATTEMPTS TO IMPLEMENT DEWEY'S PHILOSOPHY

This chapter has two purposes. The first purpose is to discuss the "project method" of William Kilpatrick. The "project method" offers an opportunity to critique a conception of Dewey's ideas in a form that was intended to be used, and in fact was used, for educational practice. An awareness of the distortions of Dewey that resulted, and the reasons for the distortions, can conceivably be of benefit in helping to avoid repeating the same mistakes in future attempts to relate Dewey's ideas to practice.

The second purpose of this chapter is to discuss the Laboratory School of the University of Chicago, the Dewey School. The purpose is to illustrate a valid use of Dewey's ideas in school situations.

The Project Method of Kilpatrick

William Heard Kilpatrick was a professor of education at Teachers College, Columbia University, from 1918 to 1938. The educational historian Lawrence Cremin said, "More than any other Kilpatrick has been acclaimed over the
years as the great interpreter and popularizer of Dewey's theories."¹ It should be noted that it was Kilpatrick's conception of Dewey that was popularized. One of the vehicles Kilpatrick used to popularize his conception of Dewey's ideas was the "project method."

The "project method" received its beginnings through an essay that Kilpatrick wrote and Teachers College published in 1918. Over 60,000 reprints were distributed over the next twenty-five years. The essay brought Kilpatrick not only national fame, but international fame as well.²

The purposeful act. The "project method" set the purposeful act of the child as the most significant part of the learning process. Purposeful activity meant nothing more than that learning activities should be consonant with the child's own goals. Kilpatrick put it this way, "Suppose a girl made a dress. If she did in hearty fashion purpose to make the dress, if she planned it, if she made it herself, then I should say the instance is that of a typical project. We have in it a wholehearted purposeful act carried on amid

²Ibid., pp. 216-220.
social surroundings.³

Kilpatrick specified four types of projects, or purposeful acts. The first type of project's purpose was of an external nature. The student might build a boat, present a play, or write a letter. The second type of project was to enjoy some aesthetic experience. The student might listen to a story or listen to music. The third type of project was problem solving. The student might attempt to ascertain how New York outgrew Philadelphia. In the fourth type of project, the purpose was to develop a skill such as a foreign language. In referring to type three, that of the problem, Kilpatrick states, "The steps that have been used are those of the Dewey analysis of thought."⁴

The project, or the purposeful act, was the result of children's interests. Kilpatrick identified interest with project. Kilpatrick did not think there was any tension between the interests of society and the interests of the child. He said, "There is no necessary conflict in kind between the social demands and the child's interests."⁵ Kilpatrick thought that if students plan their own work, set

⁴Ibid., p. 17.
⁵Ibid., p. 12.
their own goals, and achieve their own education, it would be because they were free to follow their interests. Kilpatrick said, "How many children at the close of a course decisively shut the book and say, 'Thank gracious, I am through with that!' How many people get an education and yet hate books and hate to think."⁶

Some forty years later, in explaining the background for his "project method," Kilpatrick gave this perspective:

I thought of the project method as expanding the use of 'purposeful activity' in the classroom. In expanding this use of purposeful activity into the school, I used the phrase 'purpose, plan, execute, and judge.' My idea was that the class would agree upon a purpose to pursue. They would then plan how to carry out the purpose, next execute the plan, and in the end judge the results of what they had done and decide whether or not they had succeeded. If the project was judged to be successful, they decided what to do next. In this way I sought to expand the use of 'purpose, plan, execute, and judge.'⁷

Kilpatrick thought that whole-hearted purposeful activity would be the central point of education. The important consideration was that the purposes and plans were those of the student, not of the teacher. On this point, Kilpatrick was once asked, "Could the teacher supply the plan?" It was explained to Kilpatrick, "Take a boy planting corn for example; think of the waste of land and

⁶Ibid., p. 11

fertilizer and effort. Science has worked out better plans than a boy can make." Kilpatrick answered, "I think it depends on what you seek. If you wish corn, give the boy the plan. But if you wish boy rather than corn, that is, if you wish to educate the boy to think and plan for himself, then let him make his own plans." 8

Kilpatrick advocated a child-centered approach to learning. His project method is synonymous with the child-centered approach. 9 The educational philosopher Boyd Bode said, "Whether a given task or understanding is a project or not is determined by the pupil's attitude toward it." 10 The pedagogical banner of the child-centered school epitomized Kilpatrick's position: "freedom, not restraint," "pupil initiative, not teacher initiative," "the active, not the passive school," and "child interest." 11

Kilpatrick was essentially maintaining that if the child was to learn best, the child was to follow his interests. The concept of interest greatly influenced

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8Cremin, The Transformation of the School, p. 218.


11Bayles, Democratic Educational Theory, p. 238.
Kilpatrick. Interest was a Herbartian concept. The Herbartians were interested in child development, and in the child's use of interest in learning. The Herbartian movement was at its greatest from the late 1890's to the early 1900's. The leading Herbartians were Charles A. McMurry, his brother, Frank, and Dr. Charles DeGarmo. In fact, Charles A. McMurry wrote a book titled Teaching by Projects.

Accordingly, it may be that the concept of interest, as used by Kilpatrick, took on more of a Herbartian orientation than a Deweyan. Kilpatrick studied Dewey's book, Interest as Related to Will, under Dr. DeGarmo. Kilpatrick stated, "It had great effect on me." It was unclear exactly what had great effect on Kilpatrick: studying Dewey's book, or studying it under the Herbartian, DeGarmo. Interestingly, the course that Kilpatrick eventually taught at Teachers College was the Herbartian course. Kilpatrick said, "I soon dropped the title 'Herbart and Froebel' and ultimately called the course 'Foundations of Method.'"

In contrast, Dewey was also influenced by Herbartian ideas. However, Dewey worked out his own distinctive

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13 Kilpatrick, "In Retrospect," p. 147.

14 Ibid., p. 148.
orientation and criticism of the Herbartian concept of interest. Wirth states about Dewey, "He also found the Herbartian concept of interest faulty. The basic weakness in Herbartian psychology is its habit of giving ideas a kind of existence of their own."16

Interestingly, the idea for project methods can be traced to agricultural education at the high school level. Since many pupils lived on farms, there could be home projects. The pupil's projects took the form of growing crops, caring for animals and the like.17 Bayles implied the term was borrowed from vocational education without much thought and analysis on Kilpatrick's part.18

Kilpatrick had many disciples. Cremin states, "In all he taught some 35,000 students from every state in the Union at a time when Teachers College was training a substantial percentage of the articulate leaders of American Education."19 The sheer number of students may have made clarification of problems individual students were having impossible to do.

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15 Wirth, Dewey as Educator, p. 91.
16 Ibid., p. 92.
17 Bode, Modern Educational Theories, pp. 142-143.
18 Bayles, Democratic Educational Theories, p. 237.
Differences Between Kilpatrick and Dewey

To one with a superficial acquaintance with Dewey's philosophy, it would appear that there are no crucial differences between Kilpatrick and Dewey. However, as the education historian Lawrence A. Cremin has pointed out, "There are differences with Dewey that become crucial."\(^{20}\)

In accord with Cremin is the educational philosopher Ernest Bayles. Bayles asserted:

> It is our contention that the faults which are laid, whether rightly or wrongly, at the door of Progressivism are not justifiably attributable either to Dewey or to his philosophy, but instead primarily to lack of clarity on certain crucial matters which has characterized the writings of William Heard Kilpatrick, particularly those which appeared during the high tide of Progressivism. It was Kilpatrick who introduced the 'project method' into elementary education. It is Kilpatrick whom we seemingly must credit with 'pupil purposing, pupil planning, pupil executing, pupil judging,' even though one of his most eminent students, Ellsworth Collings, may have been a bit more enthusiastic and a bit less circumspect in its use. And it was Kilpatrick who was dubbed in an authorized biography as "Trail Blazer in Education." And what trail did he blaze if not that of Progressivism?\(^ {21}\)

A significant difference between Kilpatrick and Dewey was that Dewey rejected an exclusively child-centered approach to education. As Cremin offers, it was Kilpatrick who

\(^{20}\)Ibid., p. 219.

\(^{21}\)Bayles, Democratic Educational Theory, p. 237.
"shifted the balance of Dewey's pedagogical paradigm towards the child."\textsuperscript{22} In such a shift, the role of the teacher is greatly diminished. Dewey, of course, was skeptical of any approach in which the classroom teacher was asked to default on his role of educational leader. In fact, when it comes to suggesting projects, Dewey felt that the teacher "has not only the right but the duty to suggest lines of activity, and to show that there need not be any fear of adult-imposition provided the teacher knows children as well as subjects."\textsuperscript{23} Wirth points out that Dewey had criticisms about the overly permissive excesses of the child-centered approach, but Wirth states, "In the main, however, he muted these, perhaps because he wanted to avoid adding strength to the heavy attacks constantly made on the progressive pioneers."\textsuperscript{24}

Dewey was also concerned about the short span of the projects. Dewey understood that interest could be fleeting. He knew interest could be momentary. On this point, he said, "It is possible to find problems and projects that

\textsuperscript{22}Cremin, The Transformation of the Schools, p. 220.


\textsuperscript{24}Wirth, Dewey as Educator, p. 282.
come within the scope and capacities of the experience of
the learner and which have a sufficiently long span so
that they raise new questions, introduce new and related
undertakings and create a demand for fresh knowledge.\(^\text{25}\)

**Criticisms by Teachers**

There were classroom teachers who were critical of
the "project method." Alice C. Lowengrund, a teacher at
Girls' High School Philadelphia, was critical of the empha-
sis on the child-centered approach. She felt this conception
had negative consequences in practice. She said:

Many teachers fail in project teaching because, in an effort to let children do their own pur-
posing, they let them purpose unwisely; or, in
letting the pupils plan they permit much dilly-
dallying, they have much done that is valueless,
or tend to stress the product and not the educa-
tion; or in the judging process they fail to build
up standards and generalizations that will be of
value later.\(^\text{26}\)

Florence Sweeney, a high school teacher in Detroit,
criticized those who identified Dewey's philosophy as
being nothing more but projects. Sweeney said, "To many
teacher, administrators, and lay people, Dewey's educa-
tional philosophy has been interpreted as an 'activity


program' or as 'projects.'" Sweeney was critical of projects being ends in themselves. She said, "Experience projects are not ends in themselves but are the means by which we offer young people opportunities for reflective thought." Finally, Sweeney was critical that the projects emphasized an extreme form of individualism. She stated, "The heart and core of Dewey are in the development of a socially responsible adult, not a rank individualist." 27

The "project method" resulted in some strange classroom practices. The most poignant example was the teacher who taught Latin by having students carve busts of Roman statesmen out of huge bars of Ivory Soap. 28

Boyd Bode's Criticisms of the Project Method

More than Dewey, it was Boyd Bode who offered the most detailed and analytical criticisms of Kilpatrick's "project method." Bode was a professor of education from 1921 to 1944 at Ohio State University. Cremin says, "In the last analysis it may well be that Bode's work more closely resembled the spirit and temper of Dewey's, while Kilpatrick's in seeking to make Dewey's ideas manageable


for mass consumption by the teaching profession, ended by transforming them into versions quite different from the originals."29

Bode felt the "project method" violated notions of experience. It made too much out of the immediate or the having experience. Bode said, "Perhaps children may learn a great deal about numbers from running a play store or bank, but this alone does not give them the insight into the mathematics that they need to have."30 Bode was concerned that the "project method" left a lot to incidental learning.

Bode felt Kilpatrick was unclear. Bode said, "The term "project method" has become a name for a conglomeration of ideas and not for a definite guiding principle."31 Bode felt that there was confusion with Kilpatrick's definition of method as "wholeheartedly purposeful activity." Bode said, "On this basis the project method in teaching means any procedure that arouses interests and so directs activity. The definition just given lays down no principle of procedure, and still less does it designate a specific device. If wholehearted purposeful activity can be called

29Cremin, The Transformation of the School, p. 221.
30Bode, Modern Educational Theories, p. 150.
31Ibid., p. 151.
a method, it is only because the term method is taken in a very 'broad sense.' "32

Bode felt that Kilpatrick's lack of clarity resulted in contradictions. He points out that Kilpatrick states the teacher cannot purpose. On the other hand, Kilpatrick thinks that there are certain basics such as reading and arithmetic in which, if need be, we should use compulsion.33

Bode felt Kilpatrick sentimentalized the child. He felt Kilpatrick had a mystical faith in a process of inner development which required nothing from the environment except to be left alone.34 Bode said, "But as Dewey remarks, thinking requires suggestions and the child must get his suggestions from somewhere other than the recesses of his inner consciousness."35 Kilpatrick is denying transaction. He is denying that there can be a teacher involved in the learning process. The function of the teacher is to give guidance and direction. Bode feels the "project method" evades this function.

Bode criticized Kilpatrick's position of allowing the pupil to determine his own curriculum. Bode said, "The

32 Ibid., pp. 157-158.
33 Ibid., pp. 160-161.
34 Ibid., p. 163.
35 Ibid.
leaning of Kilpatrick's position is clearly toward letting the pupil determine his own curriculum. In the case of mathematics, 'some of the pupils, particularly the more mathematically inclined, will, from time to time, put the pieces together and form wholes more or less complete. Later some will specialize in the subject.' Apparently, those who do not do so are to be let alone."

Bode was not alone in his views. Paul Arthur Schlipp warned that we should be careful not to equate Dewey with the distortions of Kilpatrick. Bayles issued the same warning.

**Kilpatrick's Distortions of Dewey's Ideas**

The distortions of Dewey can be summarized as follows:

(1) The child-centered view. This view tended to be dualistic. It denied there was a society that the child transacted with. In response to this one progressive educator wrote, "During the years we have been engrossed in the fostering and developing of child-centered schools, we

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36 Ibid., p. 165.


38 Bayles, *Democratic Educational Theories*, p. 240.
have viewed our task as though the child and the school existed in a vacuum. We have been blind to the fact that children's growth depends upon the society in which they grow."39

(2) The view of experience. The having experience was celebrated. The hope was that learning may be incidental. The cliche that what we know "could be caught rather than taught" became dominant. Kilpatrick had more of the traditional empirical view of experience. He had less of a transactional view.

(3) The view of interest. Interest was considered apart from purpose. However, interest without purpose can result in random activity. The interest level was not always one that led itself to duration or depth.

(4) The view of the teacher's role. The teacher was reduced to a very passive role. However, Dewey thought otherwise. He thought the teacher played a very active and vital role in the classroom. The teacher could make suggestions and assert leadership. Dewey said, "Guidance given by the teacher to the exercise of the pupil's intelligence is an aid to freedom, not a restriction upon it."40


(5) The view of problem solving. Problem solving was too individualistic. The Peircean notion of cooperative social inquiry was neglected. Problems were viewed as activities unto themselves.

**Probable Reasons for the Distortions**

There were reasons for these distortions. Some of the reasons can be given as follows:

(1) Kilpatrick had an either/or position. We either choose the boy or the corn. A choice framed in this manner causes one to side with the child-centered approach. The tendency is to avoid identification with traditional notions of education.

(2) Kilpatrick was lacking in clarity. Without clarity, there is room for various and sundry interpretations.

(3) Kilpatrick lost sight of the theoretical base of Dewey. As time went on, the "project method" became more and more Kilpatrick's version of education, and less and less of Dewey's. It could also be argued that Kilpatrick became more of a Herbartian than a Deweyan.

(4) Distortions can result by uncritically accepting a theory. Cremin points out that Bode was a progressive critic of Dewey. Critical acceptance, as opposed to
uncritical acceptance, helped to clarify Dewey's position in Bode's mind.

(5) Distortions can result by having a fragmented understanding of Dewey. This occurrence is related to uncritically accepting a theory. Many teachers viewed Dewey's theory as being just problem solving, or learning by doing. This resulted in a substitution of cliches for theory. This may happen whenever spokesmen, such as Kilpatrick, attempt to popularize a theory. Fads result, which in turn result in distortions. The philosophy tends to be viewed in bits and pieces. Part-whole relationships are not made.

The Dewey School

The Laboratory School of the University of Chicago, 1896 to 1903, was Dewey's first and only direct attempt to implement his philosophy in a school setting. His classic book, How We Think, appeared first in 1910. In the preface, Dewey pointed out that the ideas in the book were tested and became concrete in the Laboratory School.

Two teachers in the Laboratory School, Katherine C. Mayhew and Anna C. Edwards collaborated with Dewey to write a book about the school. In the book, they demonstrated how the method of inquiry was a unifying element in the school. They said:
Scientific method was the constantly used tool not alone in the science laboratories. By common consent it was the method at all times and in all situations where processes and activities were such that active investigation, testing out of guesses or theories, imagining possible results of this or that physical or social relation could be carried on.41

The method of inquiry was viewed as a logical extension of the philosophy of the school. It was not viewed as something apart from the theory of the school. On this matter, Mayhew and Edwards stated:

At no time, therefore, in its theory or in its practices, was there opposition between science and the school's basic philosophy of value. Scientific method and the assured facts of scientific investigations were used in daily classroom experience; activity based upon the results of both took place; and new consequences of value resulted.42

An interdisciplinary approach to the use of method was used. Method was not seen as belonging to biology or physics. For example, students learned to cook employing the method of inquiry. The students were given the concept, "The amount of time needed for cooking any food depended upon its nature." They constantly tested this concept. They worked with this concept. It was used to guide their cooking endeavors. Students used induction. They inducted the nature of cellulose. They were given foods and they had to discover the toughness of the

42 Ibid., p. 425.
They had to transfer their ideas to other foods given them. They had to cook using concepts to guide them. One could say that an omelette was the result of a test of a concept.

Mayhew and Edwards pointed out:

Each classroom was a social laboratory—a place to experiment with ideas. The children tested the efficiency of these ideas by dramatic action. The teacher was stage director, furnishing the necessary data (how and where coal is really found, where forests grow, how men get the trees that furnish lumber), and when ideas were slack, prompting with suggestions as to ways and means or helping with her greater knowledge of techniques. 43

Connections were made with experience. The experience story was an important part of the Dewey School. The attempt was to make experience reflective. If students visited a dry goods store, they would be asked to write out simple reading stories based on the experience. Students would not just have the experience. 44 They were to develop ideas from the experience.

The values of inquiry were emphasized. Mayhew and Edwards state, "It is impossible to overemphasize the importance of the spirit of inquiry to the life and growth of a child." 45

43 Ibid., p. 234.
44 Wirth, Dewey as Educator, p. 174.
Students were encouraged to develop generalizations. The process used was one in which classification was emphasized. Objects were grouped by qualities. For instance, students collected stones of certain colors, sizes, shapes, and even function, such as the ability to skip over water. This classification activity established the base from which stones could be classified more abstractly. For example, stones could be eventually classified according to their method of formation: sedimentary or igneous. 

Mayhew and Edwards pointed out that the value of classification was that classified knowledge can be used in "more mature investigation and research." The Laboratory School recognized concepts were organized in a hierarchy according to levels of complexity. Obviously, Dewey felt it helps to do inquiry when students can build upon previously learned concepts.

The Dewey School or The Laboratory School, had a fair degree of structure; that is to say, it did not have an exaggerated sense of individualism. Solving problems, developing concepts, processing experience, testing concepts, developing purpose, all of this required a modicum

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46 Ibid., p. 272.

of structure. In fact, "Children were not allowed to engage in a free selection of activities that had only immediate appeal." Darnell Rucker had the following observation:

The silly notion, frequently attributed to Dewey in particular and to progressive education in general, that children can be educated by turning them loose in attractive surroundings to pursue their impulses helter-skelter makes no sense in the light of the psychology and social theory of the Chicago philosophers.

Dewey had a theory of occupations which was utilized to bridge the gap between school and society. The occupations were used to open inquiry: they were not the end of inquiry. Arthur Wirth points out, "The children did useful work, grew carrots and lettuce in the garden, and with them made salads to be eaten at lunch." The occupations brought the children together in task-oriented groups. Dewey was attempting to emphasize the cooperative nature of human effort.

Mayhew and Edwards state that experimental method in the Laboratory School had two commandments:

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49 Ibid.

50 Wirth, *Dewey as Educator*, p. 291.

51 Ibid.
The first was: 'Think in terms of action and in terms of those acts whose consequences will expand, revise, test your ideas and theories.' The second was like unto it, so like that it was a corollary: 'Concern yourself also with the social consequences of those acts.'

Dewey's thought matured long after he left the Laboratory School, but these two commandments, as Mayhew and Edwards called them, remained a vital part of his philosophy. Finally Dewey wrote thirty years later, "The summary of the philosophy upon which the work of the school was to be based may be concluded with an extract from a writing of a later date, but one which was based upon the earlier theory as that was developed by the experiences gained in the School itself. 'All learning is from experience.'"

Experimentation with concepts was a constant activity of the Laboratory School. Experimentation meant the child was active with a purpose. It meant experience was used. It meant the child was doing.

It should be stressed that the social phase of education was put first. Dewey said, "This fact is contrary to an impression about the school which has prevailed since it was founded." The Dewey School was community-centered,

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53 Ibid., p. 476.
54 Ibid., p. 467.
not child-centered. This orientation, of course, fitted into Dewey's notion of social inquiry. Mayhew and Edwards pointed out, "In all classes teachers and children started off the day's work with a face-to-face discussion of cooperative plans for individual and group activity."\(^55\) The attempt was to create a community and to link up the work of one day to the work of another day. The continuity of experience was used in conjunction with the emphasis on community.

In concluding, it should be mentioned that the primary function of Dewey's Laboratory School was to utilize educational procedures consistent with his theory. In this regard, Wirth states, "It seems fair to add that the kinds of methods and materials utilized in the Dewey School could not be transferred to mass education enterprises where similar resources were lacking."\(^56\) For example, in The Laboratory School, there was one teacher for every eight students. Wirth states, "No pretense was made that the school's procedures could be employed in other school systems where different conditions prevailed."\(^57\)

\(^{55}\) Ibid., p. 429.

\(^{56}\) Wirth, Dewey as Educator, p. 159.

\(^{57}\) Ibid.
In any event, what the Laboratory School did was to establish that theory could be related to practice. The teachers at the Laboratory School were well aware of its philosophy. They used and referred to the philosophy to guide them in their teaching. Appropriately, it was Dewey who said, "Education is the laboratory in which philosophic distinctions become concrete and are tested." The existence of The Laboratory School personified this notion.

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The purpose of this chapter is to demonstrate teaching strategies that follow from Dewey's theory of inquiry. It is to integrate theory with practice. The teaching strategies will represent the major philosophical import of Dewey's theory: his view of knowledge as warranted assertion, his idea of experience as transaction, his idea of values functioning with skills, and his commitment to an absence of dualisms in all of human experience.

The examples to be presented will not be of the five step approach to inquiry: having students confront an indeterminate situation, identify a problem, seek data, construct a hypothesis, and test the hypothesis. On this matter, Paul Nash has remarked, "Some progressive educators have placed an exclusive emphasis on process that lacks the synthetic depth of Dewey's pragmatism."\footnote{Paul Nash, "The Strange Death of Progressive Education," \textit{Educational Theory} 14 (April 1964): 88.} It should be added that the strategies to be presented reject a child-centered approach and a positivistic approach to inquiry.
The examples of inquiry presented here are intended to show what actually could be done by teachers in our public schools. They are intended to show that Dewey's theory of inquiry is dynamic and fluid. The examples are not recipes. They merely reflect teaching and learning activities that have a philosophical basis in Dewey's theory of inquiry. It is not the contention of the author that a person unfamiliar with Dewey's theory would not be doing some of these things. Rather, the contention is that it is reasonable to believe that a person familiar with and committed to Dewey's theory of inquiry would more likely be doing them, and the contention is that these examples represent examples of how Dewey's philosophy could be used to guide teaching behavior.

**Teaching Strategies**

Teaching strategies refers to all of those things a teacher can do to set up learning activities that reflect the many aspects of inquiry as viewed from the perspective of Dewey's philosophy. The strategies have one broad goal: to have students develop skills and values that conform to Dewey's philosophy. It should be pointed out that each teaching activity can be related to other teaching activities. Examples of this relationship will be demonstrated.
On this matter, George Barton pointed out, "In educational method, we should not only talk generally about the various functions of inquiry, but also specify the subordinate arts which usually turn out to be worth mastering to make inquiry effective."²

The implication is the teacher would have strategies in which students work on inducting concepts, work on using deduction to test concepts, work on making distinctions between observing and inference. In addition, there would be strategies to help students develop inquiry attitudes. Obviously, there are other strategies that would be involved. The important consideration to keep in mind is that the teaching strategies are the logical extension of Dewey's theory, and therefore they must be seen in the context of his total philosophy. This means that students will not be spending all of their time solving problems. In essence, having students work on skills of inquiry does not necessarily mean they will be engaged in solving problems.

The Importance of Concepts

It is assumed that the teacher who plans to teach others to engage in inquiry thinking must plan and implement

ways by which students become increasingly more effective in conceptualizing and in putting concepts to work. It is hoped the teaching strategies presented will demonstrate the significance of concepts.

The development of concepts is necessary to inquiry. This does not mean developing a concept is all there is to inquiry, but it does mean that without concepts, there would be no inquiry: concepts are used to guide our inquiry. Without concepts we would merely have random activity. Without concepts, there would be no focus for the learning activities. A caveat is appropriate here. Do not equate inquiry with a student deriving his own concept. Do not associate inquiry with an inductive process. It is within the framework of Dewey's philosophy for a teacher to be deductive, that is, to give students concepts. Dewey said, "It is impossible to understand why a suggestion from one who has a larger experience and a wider horizon should not be at least as valid as a suggestion from some more or less accidental source." \(^3\)

There is a danger that students would be asked to memorize concepts. It is hoped that familiarity with Dewey's theory would act to prevent this. It is hoped that by using Dewey's theory as a guide, teachers would

understand the function of concepts. There is also a danger of students mechanically giving examples of concepts. The philosophical importance of testing should be stressed. It should be pointed out that giving examples is a form of a public test of an idea in which personal experience is used. It should also be pointed out that a student can derive a concept by testing a concept already provided to him by the teacher. It should be emphasized quite vigorously that in the Deweyan framework, concepts are not the property of teachers. Concepts are vehicles for students to become involved with their experience, to become involved with problems. Many of Dewey's philosophical principles are subsumed in the test of a concept: the idea of viewing ideas as tentative, of being open and public, of using experience, not formal logic, to understand and solve problems.

The Functional Relationship of Strategies

In the examples presented, a person who understands Dewey's philosophy could perceive the teacher attempting to have students do the following: (1) identify problems, (2) monitor their method of problem solving, (3) use induction and deduction to make inferences, develop concepts, (4) become aware of the values of inquiry, develop attitudes
of inquiry, (5) distinguish between perception and inference, deal with the Deweyan theory of experience, (6) make classifications, make relationships, (7) test concepts against experience, (8) seek data.

These strategies transact with one another. For example, testing a concept against experience transacts with the values of being open and public. In fact, by having students test concepts, the teacher is attempting to do the following: (1) have students use their experience, (2) have students derive a concept, (3) have students realize that ideas are tentative, (4) have students discover problems, (5) have students realize ideas are to be public and shared, (5) and have students realize that ideas, abstractions, are real.

Additional strategies are postulated to accompany the testing strategy. These strategies are designed to help establish the many philosophical reasons for conducting a test. Therefore, after the testing of the concept, the following questions are asked of the students: Does the concept hold up? Did you discover any new concepts? Are there any modifications to be made? The students could also be asked to give more than one example as a test. The students could be asked to explain how they went about testing the concept. The students could be asked to make
predictions that would be relevant to the use of the concept.

In essence, teaching strategies, whether testing a concept or developing the rationale for testing, do not function independently of each other. Teaching strategies function interdependently. By doing such, an overall unity of purpose is an objective of teaching strategies.

Inductive and Deductive Thinking

Before turning to examples of inquiry teaching, inductive and deductive thinking will be discussed. In fact, Dewey has noted that induction and deduction are key elements of the cognitive process of inquiry.4

Induction is a manner of thinking in which we take particular data from our experience and make a generalization. In induction, we go from the particular to the general. For example, John is mortal. Mary is mortal. Jim is mortal; therefore, all humans are mortal.

Deduction is just the opposite. Deduction is a manner of thinking in which we go from the general statement to the particular instance of it. For example, all humans are mortal. John is a human; therefore, John is mortal.

As we shall see, the teacher makes use of both induction and deduction

An Example of a Deductive Strategy

In a language arts class, the teacher could provide the following concept: "People put different meanings on the same word." Students would be asked to test this idea by giving examples of it from their experience. The teacher would ask for more than one example.

The teacher would ask the students if they could find any problem situations that would pertain to the concept. The teacher would ask the students to make a list of the problems. Students could talk about problems of writing a will. They could talk about problems of writing a peace treaty. The teacher could ask what the problem would be in writing a will or in drafting a peace treaty. The students would be asked to choose from the list a problem that they would like to investigate further. They would be asked to come up with solutions to the problem. The students would be told that they must list two concepts that they rejected as solutions, and they must be able to tell why they rejected these ideas. The students would have until the end of the week for this assignment.

The teacher could give an outside assignment in which the students were again to test the concept "People put
different meanings on the same word." The students would be asked to report their findings to the class the next day. The next day the students could share the results of their test. The teacher would ask the students if the concept always held up. He might ask about scientific words. Why do they tend to be different? The teacher could ask who got different results when they tested. The teacher would ask if while testing any new concepts were discovered. One student might offer, "We can often determine the meaning of a word by its context." The teacher had started off deductively, but now the students would be proceeding inductively. The teacher could attempt to have students transfer this idea to a problem situation. The students could be given a problem in which a person is trying to find out what a particular paragraph means. They could be asked, "Is your new idea able to fit in here?" Students would be asked to solve the problem by using their new idea. Students would be asked to point out the conditions under which the concept probably would not hold up, or would have to be modified. For instance, the context may be vague or unclear.

Eventually, the teacher could have students identify their own language problems and relate how previously learned concepts can help them. Once again, the attempt is to have students perceive that ideas are real and can be
used to solve problems. Of course, the teacher would have to make sure that the activities are of long enough duration so that students can really get involved with the concepts. Therefore, continuity would be established. Students would work with just two or three of the concepts all week. There can be additional transference activities where students have to test the concepts against their experience. For instance, it is conceivable that students could test the concepts at home, on the street, or while playing with other students on the playground.

Obviously, there is much more involved in this teaching episode than the five phases of the logic of inquiry. As we shall see, the same kinds of teacher strategies obtain when induction is used at the outset.

The Significance of Deduction

A significance of deduction is that it is a process that occurs at all grade levels. Students come to the first grade with a host of general principles already formed. The teacher uses these concepts to lead students to new experiences, and to help them understand their present experiences. For example, it is found a group of first graders have developed the concept, "There is the world of school, and there is the world of home." There is a division already between school and society. The teacher
could have students indicate the differences and the similarities between school and home. In this way, students would be classifying their experiences, and the teacher would be having students transfer into the classroom a previously learned concept. As the students transfer their idea, they are going from the general to the particular.

There are other examples of the significance of deduction. Students could be given a problem in which they have to tell their brother they lost his baseball glove. Transference of previous ideas developed from experience is being attempted by the teacher. The teacher could build in the transference by asking students if they have ever been in a similar situation. The teacher could ask, "What ideas did you learn from the similar situation?" The teacher is attempting to build on the past inferences students have made from their experiences. To do so, the teacher utilizes deduction. The student is asked to go from a general principle to a particular situation.

The use of deduction also helps to establish purpose. By beginning deductively and providing students concepts to work with, the teacher is establishing purpose. Dewey felt concepts guided inquiry. Concepts make inquiry less random. Deductive strategies presuppose the testing of ideas. A purpose of providing students with ideas is to have them test the ideas against experience. Deduction
helps to establish the significance of testing concepts.

Lesson plans are organized conceptually. When a teacher is employing a deductive strategy, he must have some concepts in mind. These concepts are relevant to the learning activity. One of the first things a teacher would do would be to list the concepts students would be working with. For example, if a teacher is having students work on developing the idea, "Human beings are changing all the time," there would be learning activities that reflect this concept. Therefore, the teacher could have students weigh each other. They could measure each other. They could bring in photographs of themselves as babies. They could take pictures of themselves. They could bring in earlier and later pictures of brothers and sisters. The important point is that all of these activities revolve around the concept. The concept is unifying the experiences of the student. A deductive process is being used to assist the lessons in being organized conceptually.

In sum, in a Deweyan framework, deduction takes on new prominence: (1) It can be used to test and transfer ideas against experience. (2) It can be used to help establish purpose. (3) It can be used to discover new concepts and new problems. (4) It can be used to organize learning activities. The misconception with the deductive
approach, as Dewey has so perceptively pointed out, is that it is mistakenly viewed as being a very traditional teaching strategy.\(^5\) It has been viewed as a strategy that is teacher dominated.

**An Example of an Inductive Strategy**

In an inductive strategy, the teacher does not give the concept nor the problem; he gives the particular data that may go into the construction of a problem or concept. The student, on his own, or with the teacher's help, is to induct the problem or the concept. The students are asked to transact with the data.

The teacher could give out a sheet of paper with the following data: Poland is 50 percent rural, 50 percent urban, 51.4 percent industrialized. Ireland is 60 percent rural, 40 percent urban, 55 percent industrialized. The Soviet Union is 45 percent rural, 55 percent urban, 55 percent industrialized. Bolivia is 66 percent rural, 34 percent urban, 12 percent industrialized. The Netherlands is 46 percent rural, 54 percent urban, 40 percent industrialized.

The students could be asked to induct concepts from this data. The teacher would ask students for their concepts. He will ask students to test their concepts. The

\(^5\)Ibid., p. 187.
concept students are working on is, "There is a relationship between industrialization and urbanization." This concept seems to be warranted by data. However, it will have to be tested. Also, it is conceivable that students would derive other concepts from this data. For instance, one student might come up with, "People tend to migrate to urban areas when they are in search of opportunities, or when times are bad; they are hungry." In any event, the same requirement of a public test would obtain, and the student should be encouraged to pursue his inference by testing it.

In dealing with the concept of the relationship between industrialization and urbanization, students could be asked to test the concept. One student could offer Sweden as a test. One student could offer Portugal. The teacher would ask if there were any exceptions to the concept. The teacher would ask, "Why is testing important?" Students would be asked to come up with problems to work on. They might come up with "How can a country become industrialized?" "What could be some of the bad features of industrialization?" "How could they be avoided?" "Would industrialization make for technology which in turn would make for unemployment?"

These problems might be worked on over a course of three weeks. The students could report their findings.
Some students might report that to become industrialized a country needs a skilled labor force. Some students might say that a supply of natural resources is important. Then, questions of having natural resources but not the technology to develop them could be raised.

One student could say that there would be a problem of unemployment with too much industrialization. He might mean that technology would put people out of work. He would be asked to give examples. He might cite blacksmiths as an example. He would be asked to give another example. He could cite typesetters. This problem could generate much interest. Students might be divided into groups to work on developing ideas to solve the problem of high unemployment. They could use as many data sources as possible. A list might be made of the places that would have data such as The Department of Labor and The U.S. Chamber of Commerce. A discussion might be begun by the teacher on why these places would have the data they were looking for. How do they know what is relevant data to their problem?

The ideas that students developed in regards to dealing with the problem of unemployment would be reported to the class. The teacher would ask if these ideas could be used in their town. He would ask if any of them were being tested. The teacher is working on transference. The teacher would ask the students how they would avoid
unemployment. The attempt is to take what is social and make it personal. Dewey did not believe in a dualism between society and the individual. Thus, a teacher might ask if an idea holds up for you does that mean it will hold up for everyone? It is important to note that the teacher could have given students data on unemployment and automation which may have been used for problem discovery. The could have inducted the problem.

The Significance of Induction

The inductive process takes place at all grade levels. Students in the second grade can be given rods of various length and color. These rods could be used by students to construct relationships. A black and yellow rod in length could be equal to a red rod in length. Students could be given problems such as, "What will equal two blue rods?"

With an inductive strategy, the building of the concept can be aided by the number of particular instances given. Taba and Elzey pointed out, "It is not beyond possibility, therefore, that many slow learners can achieve a high level of abstract thought, provided that they have the opportunity to examine a greater number of concrete instances than the teaching process typically allows."6

6Hilda Taba and Freeman F. Elzey, "Teaching Strategies and Thought Processes," Teachers College Record 64 (March 1964): 528.
The Subordinate Arts of Inquiry

A teacher using Dewey's theory as a guide would help students "master the subordinate arts" which are necessary to making inquiry effective. Some of the subordinate arts are as follows:

**Classification.** Classification is the ability to perceive similarities and differences and group accordingly. By itself, classification does not have great significance. However, in light of Dewey's theory of inquiry, classification takes on added significance. Classification is part of the inquiry process. When we classify, we make relationships. The construction of relationships is the very heart of inquiry. In fact, if a student is having difficulties making relationships, he may be having trouble classifying. It should be stressed that classification is not an end in and of itself. It is the ability to realize that classification is a part of the whole inquiry theory, that it can be linked to other skills and attitudes, that sets the inquiry teacher off from the teacher who uses classification in a routine manner, or as an end in itself.

**Distinguishing between perception and inference.** A subordinate art of Dewey's theory of inquiry is the ability to distinguish between perception and inference. This ability makes use of Dewey's conception of experience. In
Dewey's conception, experience does not merely write upon us. We process our experience. We inquire into it. For example, students could test the concept, "The outward appearance of something can sometimes give us misleading information." Students could also be given problem situations in which they are to develop this concept inductively. In any event, they would still have to test the concept. Questions could be asked such as, "Can two things look the same but act very differently?" An example could be a very inflated basketball and a very deflated basketball.

Students could be given a picture of two men. One man is very slim. The other is quite robust. The teacher asks, "Which man is the truck driver?" "What do you need to do before you can give a reasonable answer?" Dewey's philosophy provides the base from which teachers could help students distinguish between what they observe and what they infer.

**Developing the values of inquiry.** A person using Dewey's theory of inquiry as a basis for teaching strategies could have strategies to assist students in developing the values of inquiry. Students could be asked "What would change your mind on an issue?" They could be asked questions that deal with the revising of an opinion. Questions could be asked which deal with the difference between a warranted
assertion and an absolute assertion. The teacher could ask students to give examples of inquiry being used to assist in making a decision as compared to other procedures being used. Comparison and contrast could be used when planning lessons around the values of inquiry. Questions could be asked such as, "How do you think inquiry can contribute to man's sense of dignity?"

The use of interest and purpose. There would be strategies in which students would be encouraged to use their interest to lead them on to inquiry. If their interest does not lead them to use inquiry, the teacher, at the very least, could establish purpose with students for what they are doing. The hope is to transform interest into purpose. At the same time, a teacher should become aware of students' interests. He should get to know his students.

The important awareness for the teacher is not to repeat the mistake of the "project method." The teacher should not yield to the student's momentary interest without a purpose being developed. In fact, interest may come later after purpose has been established. It is important to keep in mind that interest does not automatically result in inquiry.

The notion of purpose can be used to illustrate how the various parts of Dewey's theory transact with one another.
To have inquiry, there must be purpose, and to have purpose, there must be concepts. For example, if a teacher desires to establish a purpose for having students read a certain book, he might provide the students concepts to test against the content of the story. On the other hand, the teacher could have the students develop concepts from the story. The teacher, then, could have the students test the concepts against experience.

**Question asking strategies.** Questions could be asked that encourage students to construct relationships. The questions could direct students' attention towards looking for similarities and differences. Questions could be structured in such a way as to build in the inductive process. These questions would have students take their particular answers to questions and make a generalization with them.

For example, students could be given the following:

In Alaska dog sleds are sometimes used to carry things. While in India, the people sometimes use elephants. In the rugged mountain areas of South America, donkeys are many times used to carry things. The following questions are asked: "Would the people of India use a dog sled or an elephant?" "Would people from Alaska use elephants?" "Why are donkeys used to carry things up and down mountains?" "What animal is used in desert areas?" "Why?"
The students then could be asked to look at their answers and see if they can come up with an idea. They could then be asked to test their idea. They could be asked to share their test with their classmates. They could be asked to make classifications with Alaska, India, South America. They could be asked to make classifications with dog sleds, donkeys, elephants. The students could be given problems in which they would have to choose a particular mode of travel to get where they wanted to go. The students could give reasons for their choice. Students could be asked to predict what they think travel in the future would be like. They could be asked to use the ideas they developed from the assignment the teacher gave them to help make the prediction.

The use of experience. There would be strategies designed to promote students working on problems that are related to their experiences. Dewey's principle of transaction is used as the basis for implementing teaching in which connections are made between social problems and personal experience. Transaction means that experience does not go on inside a person. Transaction states that the personal could not exist without the social. There has to be something outside of the person to give rise to the problem. Social problems are presented to students because these
problems are part of students' experiences. Dewey feels a teacher should honor a student's attempt to solve a so-called "personal problem." This does not mean, however, he solves it in any manner he desires or without guidance from the teacher. A student is not left to figure out how to play a guitar or build a jet engine on his own. This would be the child-centered approach to education. Dewey is interested in students synthesizing their personal experiences with social problems. In this regard, it is consistent with Dewey's philosophy to help students make the connection between social problems and individual experience.

It follows that there would be teaching strategies designed to promote the student's ability to make functional relationships or connections between what goes on in one part of experience to other parts of experience. Questions designed to promote the ability of make functional relationships would be asked. For instance, a group of students was once asked, "Why do you think cattle farmers in South Dakota read the paper to watch the unemployment in the East?" One student replied, "If there is much unemployment in the East, people will not be buying steaks."

It also follows that social problems would be constantly presented to students, and they would be asked to
perceive how these social problems connected to their own experiences. In other words, they would be asked to make a functional relationship between a social problem and personal experience.

An Example of the Non-Use of Experience in Inquiry Teaching

Making a connection between the social and the personal may not always happen in inquiry teaching. For example, it is possible to give students an assignment in which they have to construct a map showing the distribution of wheat production in the fifteen leading wheat producing states from 1955 to 1959. The data sheet the teacher provides the students reflects that in Ohio from 1954 to 1959 wheat decreased from 45 million to 29 million bushels. Why? We have a problem. The class suggests two hypotheses. "The decrease in wheat occurred because other crops were able to compete successfully for acreage previously used for wheat." "The decrease in wheat was associated with a decline in county wheat acreage allotment." In the first hypothesis, farmers may have decided to plant more soybeans. In the second hypothesis, the state may have decided to cut back on its subsidy. These two concepts are tested. Data is obtained from the state department of agriculture. The data indicates hypothesis two should be accepted.
The foregoing was an example of a problem situation in which students went through the five steps of problem solving very mechanistically and very skillfully. Yet, there was no connection between the problem and students' experiences. A conscious reference to Dewey's theory would inform the teacher that inquiry teaching does not end here. The end of inquiry is not solving a problem. Connections remain to be made between personal experience.

The same situation revisited. The same teaching situation is further developed by another teacher. He asks the students, "How might a lower wheat yield personally affect you?" One student says that there would be less bread. Another student points out that this would mean that his family would have to pay higher prices for bread. The student is asked why. The student responds that whenever something is scarce it becomes valuable. The teacher asks the student to test this. The student cites the recent oil shortage. The student is asked for another test. The student cites some rare stamps that he had bought from a friend.

In essence, in this situation, the teacher took the problem and connected it to the students' experiences. In the first situation, this was not done. The first situation was an inductive, intellectual exercise. In this
situation, the teacher was not only interested in getting students to solve a problem, he wanted students to use their experience.

The Significance of a Conceptual Framework

It is a contention of this author that if and in what manner inquiry is used is related to one's conceptual framework. This contention suggests that any transmission of knowledge has the potential to be used for inquiry. For example, a teacher could use the Cleveland Telephone Directory as a data source for inquiry. A social studies course could conceivably be built around the Cleveland Telephone Directory. Students could be asked to make relationships from the data. Problems could be given which could stimulate inquiry and the development of concepts. Students could be asked, "Why is there a large number of names ending with 'ski' living in one particular part of the city?" This does not mean that anything beyond the mere transmission of data is inquiry. It does mean that any transmission of data can be used by the teacher to develop inquiry thinking in students. It does mean any experiences that students have can potentially be used for reflective thinking. Whether or not this is accomplished is dependent, to a large extent, upon the teacher's philosophical outlook.
Summary

In many of the examples of practical applications, the teacher provided the problems, the data, and the concepts. The teacher had students use their experiences. The teacher asked questions that dealt with the transference of ideas. The teacher worked on the values of inquiry. Concepts were tested so that students could become aware that ideas are tentative and not absolute. Ideas were tested so that students could become aware of the importance of connecting ideas to experience.

The practical applications all had in common an active teacher providing guidance and direction to students. In fact, these examples were very insistent on conveying Dewey's notion of the guiding role of the teacher. Dewey said, "Guidance given by the teacher to the exercise of the pupil's intelligence is an aid to freedom, not a restriction upon it."\(^7\) In sum, Dewey, felt a teacher who is not afraid to assume a strong leadership role in the classroom will be better able to develop the skills and the values of inquiry with his students.

\(^7\)Dewey, *Experience and Education*, p. 71.
CHAPTER VI
CONCLUSIONS AND RECOMMENDATIONS

It will be the purpose of this final chapter to present conclusions and recommendations regarding the use of Dewey's theory of inquiry as a basis for the development of inquiry teaching.

Conclusions

1. Inquiry is more than problem solving. When inquiry is viewed only as a method of problem solving, it is perceived as a logic, not as a philosophy. It is absurd to think that students would be solving problems all of the time. This is a restricted view of inquiry. Dewey's theory of inquiry can only be understood in the context of his total philosophy. It is maintained by the author that unless this recognition is acted upon it appears likely that the five cognitive steps of inquiry will be seen as the sum and substance of Dewey's theory of inquiry. However, Dewey's philosophy encourages a multitude of uses for inquiry. Thus, viewing inquiry as only problem solving will result in the full depth and breadth of Dewey's philosophy being neglected.
The significance of Dewey's theory of inquiry is in its relationship to a broader philosophical view. It is conceivable that an understanding of the philosophical view could do much to help one understand that inquiry is more than problem solving.

2. With the aid of an understanding of Dewey's theory, most teaching that goes on in classrooms theoretically could, with intellectual effort and commitment, be transformed into inquiry teaching. Whatever the teacher is presently doing with students could be used as an entry point for inquiry teaching. From the entry point, the other components of inquiry could be eventually developed.

For example, whenever teachers disseminate data, this data could be used to initiate inquiry. Students could be asked to construct concepts from the data. The teacher who now provides concepts to students for non-inquiry purposes such as memorization could ask students to test the concepts. The teacher who asks questions could structure question asking to build in the induction of concepts. The teacher who has students read for information could ask students to construct relationships from what they read.

Once the teacher examines his classroom practices in the light of Dewey's philosophy, the teacher who now has
students work on skills in isolation, such as classification skills, could see where his practices fit into Dewey's total philosophy.

Whether teachers should make the transformation is another question. The point to be made here is that an examination of present teaching efforts in light of Dewey's theory of inquiry could play an important role in transforming present teaching efforts. An examination of present teaching strategies in light of Dewey's theory could be accomplished through in-service education.

3. Deduction has a significant role to play in Dewey's theory of inquiry. With Dewey's theory, one teaching objective is the discovery of relationships. As students begin deductively to test a concept against experience, they may discover new concepts.

Deduction is more than simply providing students with concepts. Deduction is a part of other aspects of inquiry, such as developing an experimental attitude that holds concepts are to be tested and revised against experience.

It was Dewey's hope that students would grow as they developed concepts from their experiences and as they revised concepts in the light of new experience. Students come to school with a host of general principles already
formed. The teacher uses these concepts to lead students to new experiences. Dewey was aware that educational reformers were concerned that a deductive approach to inquiry could prohibit rather than promote growth. As this dissertation has indicated, Dewey felt it was a mistake on the part of educational reformers to oppose deduction to growth. According to Dewey, deduction used properly, that is, not in isolation, can even be used to motivate inquiry.¹

It has been pointed out elsewhere in the dissertation that many inquiry teaching efforts tend to emphasize only induction because of a conception of scientific method as an inductive method.

4. The two most common distortions of Dewey's theory are an exclusive child-centered view of the learning process, and a positivistic view of Dewey's theory of inquiry.

The positivistic distortions, as pointed out in this study, are difficult to perceive at first glance because of similarities between positivism and Dewey's pragmatism. The paramount similarity is that both positivism and Dewey's pragmatism are empirical philosophies. Dewey's theory of inquiry becomes positivistic when values are deemed to be

subjective and therefore not capable of experiential verification. In other words, to place the ethical outside the domain of inquiry method would be to distort Dewey's views of inquiry towards a positivistic view. In addition, Dewey's theory of inquiry could be distorted to a positivistic emphasis whenever inquiry is viewed as having the solving of problems as its sole objective. In Dewey's view, using inquiry to solve problems is a means to develop humanistic values of tolerance and openness.

It has been pointed out that an exclusive child-centered approach is more Kilpatrickian than Deweyan. John J. McDermott states, "Contrary to the oft-held view, Dewey's position is not that of a child-centered classroom, if that means learning is subordinate to the whim of the child."\(^2\) Obviously, this does not mean that Dewey neglects the experience and the interests of the child. It does not mean that Dewey neglects the developmental level of the child. In these respects, Dewey focuses on the child. On the other hand, it does mean that Dewey did not oppose the child to the curriculum or oppose the child to the teacher. Any such antithesis was rejected forthrightly by Dewey as a distortion of his philosophy. It has been

pointed out in this dissertation that Kilpatrick presented educators with an antithesis: either they choose the boy or they choose the corn.

In talking about Dewey's ideas being distorted to mean an exclusive child-centered view, Richard Hofstadter stated:

The concept of individual growth became hostage in the hands of educational thinkers who were obsessed with the child-centered school. Although Dewey himself did not accept the antithesis between the child and society as a finality—indeed, he hoped to achieve a harmonious synthesis of the two—the historical effect of the conception of education as growth was to exalt the child and dismiss the problem of society, on the ground that the growth of the child stood for health, whereas the traditions of society (including curricular traditions) stood for outworn excessively authoritative demands. 3

The exclusive child-centered view was the position of Kilpatrick. As stated earlier in this dissertation, Bayles felt that Kilpatrick's child-centered view was a distortion of Dewey's philosophy. Needless to say, claiming that the child-centered view is a Deweyan view has been the source of much debate.

5. Inquiry teaching requires structure. Inquiry teaching is directive. In Dewey's view, students do not have a directionless education. The child is not left to himself without guidance from the teacher. Dewey feels that the teacher supplies the "environing conditions which are requisite to start and guide thought."\(^4\)

It was Dewey's hope that an understanding of and a commitment to his philosophy would be a major factor in a teacher developing a directive approach which furthered rather than curtailed inquiry. The absence of a directive approach is not justified by Dewey's philosophy. What is justified by Dewey's philosophy is that a teacher can be directive and still help students make connections between their personal experience and their formal education. A teacher can guide, direct, and help a student develop inquiry skills and values; such guidance does not necessarily lead to a restriction of thought.

Inquiry teaching, to a large degree, is dependent upon students becoming aware of the structure of inquiry and of the norms governing that structure. The norms extend

from being open and public to perceiving ideas as warranted assertions rather than as absolute truths. Some additional norms of inquiry that students could be made aware of are a willingness to change with new data, a willingness to share ideas, and a respect for abstractions as having a grounding in experience. These norms are derived from the philosophy of Dewey. These norms are made working principles of the classroom. It was Dewey's hope that the structuring in of these and other norms by the teacher would help to establish a framework conducive to inquiry. As noted previously, an explicit classroom structure with explicit norms appeared to be a characteristic of the Dewey Laboratory School.

6. Dewey's notion of transaction could be utilized as a principle of learning theory. Mere transaction, by itself, does not assure learning, but in Dewey's view, it is a vital principle of the learning process that could be utilized by the teacher in his planning of learning experiences for students.

Exactly how people learn remains to be found. However, Dewey's principle of transaction maintains that the learner is not born with innate ideas, nor does the learner simply have ideas imprinted on him by the environment. In Dewey's view, most behavior of human beings is learned behavior. Most learning is the result of a transaction with an environment.
The significance of this is that if a teacher is employing transaction as a principle of learning theory, the student would be asked to be active with ideas. Students would be asked to test ideas. Students would be asked to transfer ideas from one experience to another experience. In short, ideas have an instrumental character: they are to be acted upon. Ideas are to be operation- alized. In Dewey's view, it would follow that if the student remains passive and merely is asked to memorize ideas and facts, there is very little transaction, and there is very little learning. Dewey, of course, maintained that activity must be purposeful. Activity unto itself will not necessarily result in learning.

The much celebrated pedagogical maxim, "We learn by doing" is a conception of transaction as a learning principle in which students are purposefully active with ideas.

7. Positivism is a dominant philosophy in our culture. Positivistic approaches to inquiry teaching are approaches in vogue. The positivistic approaches to inquiry do not necessarily come about because of a reading and investigation into the philosophy of positivism. It is more likely that the positivistic approaches come about because of the ascendancy in our culture of a science that is divorced from value questions. The ascendancy of a science that Habermas
spoke of in which technical questions are readily addressed while normative questions are dismissed or avoided is quite hospitable to a positivistic outlook.

A few other examples of the influence of positivism in education are suggested here. Undoubtedly, there are other variables involved. Nonetheless, it is maintained that the influence of positivism is a significant variable at work. There is the influence of measurement. Positivism attempts to be precise. Measurement is important. Positivism attempts to be quantitative, to reduce experience to statistics. High test scores on the part of students tend to be equated with having a good school system. A positivistic influence contributes to schools being run with a business-oriented mentality. In many respects, the positivistic emphasis on quantification contributes to superintendents and principals being viewed as efficient managers and not as educational leaders. In fact, being able to present taxpayers with cost-cutting measures may be one of the most important traits of an administrator.

8. A diminution of dualistic thinking would help to lower a resistance to Dewey's theory of inquiry. Many people are resistant to Dewey's philosophy because of the powerful influence of dualistic thought. Dualism is quite prevalent.
Some of the forms that it takes are: (1) Facts are separated from values; (2) Prescriptions are separated from descriptions; (3) Value questions are separated from the process of inquiry; inquiry can only settle scientific questions; (4) The affective is separated from the cognitive. Dualistic thought also makes it easier for positivistic versions of inquiry to predominate over Deweyan versions: positivism would accept a division between an objective world and a subjective world. In essence, a challenge to dualistic thought could do much in establishing a framework for acceptance of Dewey's thought.

9. Dewey's theory of inquiry requires the use of teaching strategies that take an integrated approach. An integrated approach means that each teaching activity can be related to other teaching activities. For example, classification works with deduction, which in turn works with induction. Functional relationships exist among the subordinate parts of Dewey's theory. These relationships make it easier to make connections between one teaching strategy and another teaching strategy. The implication is that there are many different learning activities which can be related.

An integrated approach also has implications for diagnostic teaching. For example, if a student is having
trouble inducting concepts, this skill could be isolated and worked on. Later, the teacher could have the student work on testing the concepts he had inducted. For example, a student may be experiencing difficulty in making relationships from data. The teacher could have the student work on only this skill. Later, the teacher could have the student work on the skill of making functional relationships, connecting social problems to personal experience. The important consideration is that all of these strategies are logical extensions of Dewey's philosophy, and that all of these strategies are related.

10. Inquiry teaching according to Dewey's theory requires, among other things, that the teacher have developed a conceptual framework. A person unfamiliar with Dewey's theory could be a highly skilled inquiry teacher. Many of the things such a teacher does could be highly congruent to Dewey's philosophy. This is possible. However, reason and experience tend to make for the conclusion that such a teacher would be the exception, not the rule. It is more reasonable to believe that knowledge of Dewey's theory and a commitment to it will act as a major factor in leading to teaching behavior according to his philosophy. Obviously, knowledge and commitment are not sufficient unto them-
selves, but they could go a long way to teaching according to Dewey's philosophy.

Once a teacher has developed the conceptual framework, the opportunities to develop inquiry thinking in students are greatly enhanced. Dewey saw the possibilities for inquiry in almost anything. This means that materials and textbooks cannot be blamed for the lack of inquiry teaching. The key to the use of materials is the teacher's conceptual framework.

With such a framework, even a can of peas could be viewed as a vehicle for the initiation of inquiry. For example, a student could be asked, "Why are the higher priced peas called French, and why do they have a fancy label?" This question could set in motion many inquiry types of behavior on the part of students. Concepts of status could be generated and tested by students. New concepts could be discovered from the testing of concepts. Problems of class structure could be discovered by some students. Other students may discover other problems. It is hard to know what problems some students may discover. Concepts of transportation, concepts of dealing with advertising, of appealing to people's vanities, could be generated by students. Concepts dealing with the role of government, the pure food and drug act, and interstate commerce
could be generated.

The can of peas is a vehicle for inquiry. It is a starting point for inquiry. It is not inquiry itself. The point to be made is that the teacher's conceptual framework could be such as to perceive any old thing, in this case, a can of peas, as a vehicle for inquiry teaching.

It should be noted that the teaching of inquiry requires the same conceptual framework as the ability to do inquiry. The difference is more of a role difference than a conceptual difference. However, a good part of the teacher's role is determined by the teacher's conceptual framework.

**Recommendations**

As a result of this investigation, the following recommendations regarding the use of Dewey's theory as a basis for the development of inquiry teaching strategies are made:

1. Teachers must be engaged philosophically. This means that teachers should be able to identify philosophical positions. It means teachers should be able to perceive that ideas, abstractions, are real. They should be made aware that the ideas of human beings have practical consequences. Teachers should be made aware of their own philosophical proclivities and the possible consequences of them.
There should be assignments in which teacher education students identify philosophical positions and are able to predict what the resultant educational system would be like. For example, a rationalist would tend to emphasize the classics.

Students of education should develop a critical view of Dewey's theory. One way to deal with the distortions of Dewey's theory is to teach the theory critically. Students could read criticisms of Dewey. They could be made aware of the issues his philosophy raises.

Dualism could be confronted by assuring that the theory of inquiry is not taught apart from the philosophy of Dewey. In fact, explanations of Dewey's theory of inquiry should hold the topic of problem solving until the end. Other aspects of the theory, such as the values of inquiry and the role of experience, should be discussed first. This would help to assure that other elements of Dewey's theory are included along with problem solving.

Philosophical feedback should be given to teachers. There has yet been no such attempt, to my knowledge, to design a teacher observation procedure that takes into consideration whether a teacher is relating theory to practice or whether a teacher has thought about the philosophical and practical implications of his ideas.
In fact, students should take a course in philosophy while they are doing their student teaching. During this time, feedback sessions could be provided that deal with how well a student teacher related theory to practice. Feedback sessions could be given on the relation of one's ideas to one's teaching.

2. There should be new teaching certification requirements based on philosophical skills and attitudes. The new requirements would be based on teachers being able to identify philosophical positions and the consequences of these positions.

The present competency based movement towards certification requirements tends to be positivistic. Its proponents tend to emphasize the demonstration of objective, quantifiable skills. The importance of abstractions is being neglected. Therefore, to remedy this trend, skills and attitudes of philosophy should be part of the new certification requirements.

3. It would help the teacher educator or the person giving an inservice workshop to use the concepts available on the conditions most favorable to an open mind, and those conditions most unfavorable to having an open mind. For example, a person open to Dewey's version of inquiry considers the
consequences of his ideas. He is not an absolutist. He treats ideas as tentative. He is flexible. He is not afraid to be wrong. He enjoys solving problems. He tends to delay making judgments. He waits for the evidence. He does not have need for an absolute resolution to every problem.  

The person most resistant to Dewey's inquiry tends to have a closed mind. He has a need for absolutes. He has a need to follow authority. He believes what he wants to in spite of evidence to the contrary. He is a dualist. He separates emotion from reason. He separates theory from practice. He has strong needs to conform to the norms of the group. He is afraid to experiment. The need for security is so overpowering as to be debilitating.  

It would also help an inservice educator to be aware of the social conditions that are hostile to the development of Dewey's ideas. It would aid the inservice educator in that he would be able to anticipate resistance. and therefore he could devise strategies accordingly.

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6 Ibid., pp. 28-34.
The social conditions hostile to inquiry tend to be totalitarian. There tend to be severe limitations on freedom. There is censorship. There are not any free elections. Civil liberties are denied. There is, in essence, a chilling effect on thought. All of these traits do not need to be present to have the chilling effect. An example of a condition inimical to inquiry is the McCarthy Era.

Social conditions favorable to inquiry tend to be democratic. People have the opportunity to meet and discuss affairs of civic interest. Dissent is tolerated. Society is relatively open. Data is made available to citizens in order that they may have the basis for intelligent decisions. 7

4. It would be wise to fit Dewey's theory into the prevailing social and individual ethos. Inquiry should use the prevailing norms of an educational system. The established norms would be the point of entry. For example, the current trend is to emphasize basic education. Therefore, it should be shown that the basics can be developed at the same time inquiry skills and attitudes are developed. In fact, it should be demonstrated that inquiry skills can

aid in the development of basic skills. If there is a question of content coverage or basic factual information that students should have, it could be stressed that more facts, not less, are needed for inquiry. It could be stressed that developing the basic ability to read can aid a student in gathering data which is necessary for the construction of concepts.

5. A reinforcement system should be established to reward Deweyan teaching behavior. The climate of the school will reflect the climate of society. The school climate is presently constructed so as not to give extrinsic rewards for teachers who use inquiry in the Deweyan fashion. Any reward such teachers receive tends to be intrinsic. On the other hand, an administrator could give extrinsic rewards to supplement the intrinsic rewards. Study hall periods could be reduced. Praise and encouragement could be given. In essence, there should be some kind of extrinsic reward system instituted.

6. Inservice workshops should be designed to convert present teaching efforts to conform with Dewey's philosophy. Rather than from theory to practice, the design of the workshops would go from practice to theory. The relationship between
theory and practice would be established experientially. In any event, all recommendations for inquiry teaching should be built around the proposition that a thorough acquaintance with Dewey's philosophy is essential. The philosophy should be grasped in its entirety and not merely in its parts. Much damage has already been done by taking a part of Dewey's thought and neglecting other parts. When this happens, the whole of Dewey's thought is neglected. Therefore, the whole of Dewey's philosophy must be presented to teachers, not bits and parts of it. It is highly recommended that the inservice education stress Dewey's theory as being experimental theory. Without such stressing, proselytizing rather than educating could occur.
Author's Observations

The teaching strategies that have been presented here have been derived from a particular interpretation of Dewey's ideas. There are other interpretations of Dewey's philosophy that advocate a more child-centered view of the teaching/learning process than the interpretation presented here. In this regard, the work of Harold Rugg and Ann Schumacher, authors of *The Child Centered School* come to mind. Dewey warned against getting into an either/or position between child-centered and teacher-centered points of view. Recognition of Dewey's admonition is reflected in the interpretation and in the teaching strategies derived from the interpretation.

The author feels that a key to understanding Dewey is to place his ideas in experiential situations. In short, it helps to view abstractions as real. It helps to relate theory to practice. Viewing ideas apart from experiential situations may make for confusion regarding Dewey's philosophy. Accordingly, this interpretation of Dewey's philosophy was combined with practical examples. These examples reflect an interpretation of Dewey in which
it is the teacher's task to assert educational leadership in the classroom to stimulate the inquiry process. Without this leadership on the part of teachers, it is unlikely that Dewey's philosophy will receive a test in practice.
BIBLIOGRAPHY


