THE LOGIC OF CLASSROOM QUESTIONS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

By

Rodney Paul Riegle, B.A., M.A.
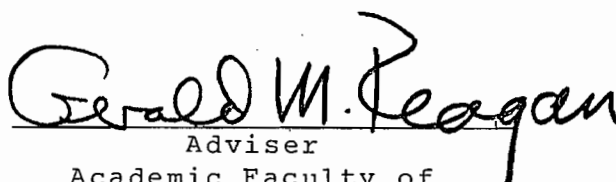
* * * * *

The Ohio State University

1974

Reading Committee:

Dr. Gerald M. Reagan

Dr. Richard Pratte

Dr. Philip L. Smith

Approved By

_____
Adviser
Academic Faculty of
Curriculum and Foundations

)

VITA

June 28, 1948... Born - Lima, Ohio

1971.............. B.A., Wittenberg University, Springfield, Ohio

1971............. M.A., The Ohio State University, Columbus, Ohio

1971-1974........ Teaching Associate, Academic Faculty of Curriculum and Foundations, The Ohio State University, Columbus, Ohio

PUBLICATIONS

"The Concept of 'Learning.'" Philosophy of Education 1973: Proceedings of the Twenty-Ninth Annual Meeting of the Philosophy of Education Society, pp. 77-85.

FIELDS OF STUDY

Major Field: Philosophy of Education

Studies in Philosophy of Education. Professors Gerald M. Reagan, Richard Pratte, Philip L. Smith

Studies in History of Education. Mrs. Ruth Simmons

Studies in Sociology of Education. Professor Monica Wittig

Studies in Philosophy. Professor Bernard Rosen

TABLE OF CONTENTS

Chapter 1

INTRODUCTION

The purpose of this chapter is to provide an introduction to a study of the logic of classroom questions. Accordingly, it is divided into sections devoted to 1.) the scope and methodology of this study, 2.) the relationship between logic and pedagogy, 3.) the relationship between questions and teaching, and 4.) an outline of the remaining chapters in this study.

The Scope and Methodology of this Study

The focus of this study is on the logic of classroom questions and the pedagogical implications thereof. It is a study in philosophy of education, and its intended audience includes both philosophers and educators. It should be noted at the outset that the pedagogical applications of this study are very broad in nature. That is, it is directed towards teachers in general, irrespective of their subject-matter area, grade level, etc.

In order to clarify the methodology employed throughout this study, it is necessary to make a few distinctions. This study is an exercise in analytic philosophy of education. The methodological approach of analytic philosophy can be

divided into at least three general areas--argument analysis, language analysis, and conceptual analysis. In practice these three techniques often overlap, and it is sometimes difficult to separate them, but the distinction will be useful for explanatory purposes. Argument analysis examines the soundness of arguments--the validity of their forms and the truth of their premises. Language analysis is concerned with the various linguistic forms (statements, definitions, explanations, metaphors, slogans, etc.) and their uses and misuses. Conceptual analysis deals primarily with the characteristics of words (ambiguity, vagueness, etc.) Two clear examples of the use of the analytic approach to philosophy of education are An Introduction to the Analysis of Educational Concepts by Jonas F. Soltis[1] and The Language of Education by Israel Scheffler.[2]

This study will employ all three of the analytic techniques mentioned above in an analysis of the logic of classroom questions. Thus far, there have been only four brief attempts at anything similar to this. Other than two articles, one by Bertram Bandman[3] and another by

[1] Jonas F. Soltis, An Introduction to the Analysis of Educational Concepts (Reading, Massachusetts: Addison-Wesley Publishing Company, 1968).

[2] Israel Scheffler, The Language of Education (Springfield, Illinois: Charles C. Thomas, 1960).

[3] Bertram Bandman, "What Makes an Educational Question Right or Wrong?" Philosophy of Education 1967: Proceedings of the Twenty-Third Annual Meeting of the Philosophy of Education Society, pp. 127-140.

C. J. B. Macmillan,[4] a portion of a book by Jane Martin,[5] and

a monograph by B. O. Smith and M. O. Meux,[6] virtually nothing

of significance has been written by analytic philosophers of

education about the logic of classroom questions. Moreover,

what work philosophers of education have done in this area

has been largely ignored by practicing educators.

Thus, the problem is twofold: 1.) to encourage more

philosophical attention to the analysis of the logic of

classroom questions, and 2.) to foster a situation in which

philosophers of education and practicing educators are not

just interested in the same topic, but are actually listening

to what each other has to say. This study is at least a

partial solution to the first problem. Hopefully it will

spur more philosophers of education into working in this area,

for this study is in no way final or complete. Furthermore,

the solution to the second problem may rest, at least partially,

on the success of studies such as this in demonstrating the

pedagogical significance of an adequate analysis of the logic

of classroom questions to such a degree that it can not be

ignored by practicing educators.

---

[4]C. J. Macmillan, "Questions and the Concept of
Motivation," Philosophy of Education 1968: Proceedings of the
Twenty-Fourth Annual Meeting of the Philosophy of Education
Society, pp. 239-251.

[5]Jane R. Martin, Explaining, Understanding, and
Teaching (New York: McGraw-Hill Book Company, 1970), pp. 60-
110.

[6]B. O. Smith and Milton O. Meux, A Study of the Logic
of Teaching (Urbana, Illinois: University of Illinois Press,
1970).

The Relationship between Logic and Pedagogy

Before attempting to describe the relationship between logic and pedagogy, the concept of 'logic' must be further explicated. The word 'logic' is sometimes used by academicians and logicians in a rather restricted way to refer to the science of determining the formal validity of arguments-- determining whether the conclusion of an argument follows from its premises. Throughout this study, 'logic' will not be restricted to this academic sense but instead will be used in a broader, more common sense kind of way. In this broader sense, 'logic' is exhibited by everyone who thinks or com- municates. That is, 'logic' can be applied, not only to arguments, but to the ways words, statements, definitions, explanations, metaphors, slogans, and so on, are used and abused. It is this common sense concept of 'logic' that is intended in the title of this study. A study of the logic of classroom questions is a study of the grammar of classroom questions, an examination that includes syntactic, semantic, and pragmatic considerations. In short, this is a study of the uses and misuses of classroom questions.

An important consideration that needs to be emphasized is that philosophers of education, by the very nature of their occupation, must travel that extra mile. It is not enough for a philosopher of education to do a very rigorous analysis of the logic of classroom questions, it is also necessary to go that extra mile and point out the ways in

which the analysis applies to educational practice. Thus

it is, that philosophers of education deal not only with

logic and logical distinctions, but also with pedagogy and

pedagogical distinctions.

The relationship between logic and pedagogy is rather

difficult to describe, but a few lucid attempts have been

made. In Contemporary Theories of Education Richard Pratte

writes:

> There can be little doubt that successful teaching
> involves being knowledgeable about the tools of logic
> and the techniques of analysis of language. The treat-
> ment of any subject will be advanced by noting the
> logical aspects of argument, the logical moves that
> continuously occur in the classroom, and the importance
> of context in the application of the strategies.[7]

In a similar vein George Kneller comments:

> ...teachers who are trained in logic will be more likely
> to inculcate habits of clear and orderly thinking in
> their students. A systematic knowledge of logic and
> language helps us to communicate clearly, hence
> effectively, in matters of teaching, learning, and
> thinking in every sphere of education.[8]

Although this study is in wholehearted agreement with the two

philosophers of education quoted above, the following

disclaimer found in the first chapter of Robert Ennis' book,

Logic in Teaching, bears repeating:

> Please be absolutely clear that although I do not
> continuously say so, I believe that logical teaching
> can only be effective if the proper psychological moves

---

[7]Richard Pratte, Contemporary Theories of Education
(Scranton, Pennsylvania: Intext Educational Publishers, 1971),
p. 306.

[8]George F. Kneller, Logic and Language of Education
(New York: John Wiley and Sons, Inc., 1966), p. vii.

are made also. All the rigor you can muster is of no
value if no one is paying attention. On the other
hand, having the attention and enthusiasm of students
is to no avail if the result of your teaching is con-
fusion and error.[9]

In The Activities of Teaching Thomas F. Green picks

up on Ennis' distinction between logic and psychology and the

importance of each to good teaching. Green divides the

activities that teachers perform into three categories;

institutional, strategical, and logical. Institutional

activities (e.g., collecting money, taking attendance, pa-

trolling the hall, etc.) are required of teachers, not by

the nature of teaching, but by the nature of the institution

in which they hold a position or office. Strategical

activities (e.g., planning, disciplining, counseling, etc.)

are those that have primarily to do with the teacher's plan

or strategy, the way material is organized or students are

directed in the course of teaching. Logical activities

(e.g., defining, explaining, arguing, etc.) are concerned

primarily with thinking or reasoning in teaching. Green

points out that the institutional activities are not

necessary to the activity of teaching. A father may teach

his son the use of a lathe, for example, without necessarily

performing any institutional activities. However, teaching

cannot occur independently of the logical and strategical

activities as Green demonstrates in the following passage:

---

[9]Robert Ennis, Logic in Teaching (Englewood Cliffs,
N. J.: Prentice-Hall, Inc., 1969), pp. 1-2.

Consider the following project. Let us go into a
classroom to record a teaching sequence with video
tape and written notes. Let us suppose that later we
examine the record, rerun the tape, and find that at no
point did the teacher draw a conclusion, define, explain,
compare, or contrast. Never did he give reasons,
provide evidence, demonstrate anything, answer questions,
or question answers. We might ask, under these circum-
stances, just what did the teacher do? We might suspect
that we chose the wrong class hour to observe and to
record, or that we had inadvertently happened into a
meeting where no teaching was going on--a club meeting,
or a social gathering of some kind, or a study hall.
In any case, it seems clear that the absence of all of
the logical acts of teaching would count heavily against
the view that teaching was going on.

Suppose that a careful study of our record showed
that the teacher spent the entire time giving directions
and administering a test. In that case, we would not
be surprised by the absence of the logical activities
of teaching. We would not expect the teacher to do any
teaching during that kind of meeting, but we would
expect him to be able to give some account of the place
of the test in a sequence of teaching sessions. That
is, we would expect the administration of the test to
reflect some plan of teaching, some strategy of instruc-
tion. Suppose, however, that on subsequent visits to
successive sessions of the class, we found that the
teacher never engaged in the logical acts of teaching
and did not apparently act according to any plan pro-
viding a connection between successive sessions of the
class. Under these conditions we would be baffled
about what was happening. Would we still say that he
was engaged in teaching? Certainly not. The absence
of the strategic acts of teaching would also count
strongly against the view that teaching was going on.
In the absence of both the logical and the strategic
aspects of teaching, it seems impossible to maintain
that we have considered a case of teaching. In the
absence of both kinds of activity, we no longer have an
example of the sort of thing we normally call teaching.
In short, there does seem to be an inconsistency in
the idea that teaching might go on without either the
logical or strategic activities of teaching.[10]

The important point is that all teachers, if they are indeed

teaching, employ the logical activities of teaching at some

---

[10]Thomas F. Green, The Activities of Teaching (New
York: McGraw-Hill Book Company, 1971), p. 6.

point in time, and thus it is possible to improve the teaching techniques of any teacher by improving his/her ability to perform and evaluate the logical activities of teaching.

Green points out that strategical activities are appraised by their consequences for learning, while logical activities are appraised on logical grounds, independently of their consequences for learning. Thus, an explanation, for example, can be evaluated on logical grounds as being good if it accounts for what is to be explained, is well-constructed, and contains no logical faults without considering whether anyone learns from it. This is not to say that teaching should be evaluated solely on logical grounds. An explanation may be sound in every logical respect but be a bad explanation strategically because, for example, the students are not ready to understand it--it would be strategically inappropriate to give a graduate level explanation of photosynthesis to second-graders. Clearly, good teaching requires the successful performance of strategical activities as well as logical activities. The point being made here, however, is that certain activities (i.e., logical ones) can be evaluated independently of their results in getting someone to learn.

Questioning is an activity that seems to qualify as both a strategical activity and a logical activity. That is, questions can be used to achieve a particular goal (e.g., to

acquire information, to test a student's knowledge, etc.) and thus can be evaluated on how well they work in the class-room (i.e., strategically). In addition questions can be evaluated on logical grounds (e.g., how well they are constructed, etc.) independently of how well they work in the classroom. The major thrust of this study will be directed towards questioning as a logical activity, but this is in no way meant to diminish the importance of strategy in questioning.

The Relationship between Questioning and Teaching

It is a well-documented fact that the use of questions is one of the most common teaching techniques. As far back as 1912, Steven studied the role of questions in the classroom and estimated that four-fifths of school time was occupied with question-and answer dialogue. She found that a sample of high-school teachers asked a mean number of 395 questions per day.[11] High frequencies of question use by teachers were also found in more recent investigations. In 1960 Floyd found that ten primary-grade teachers asked an average of 348 questions during each school day.[12] A study by Moyer in 1965 of twelve elementary-school teachers found

[11]Romiett Stevens, "The Question as a Measure of Efficiency in Instruction: A Critical Study of Classroom Practice," Teachers College Contributions to Education, no. 48 (1912).

[12]William Floyd, "An Analysis of the Oral Questioning Activity in Selected Colorado Primary Classrooms" (Ph.D. dissertation, Colorado State College, 1960).

that each asked an average of 180 questions during a science

lesson.[13] Finally, Schreiber determined in a 1967 study that

fourteen fifth-grade teachers asked an average of 64 questions

each in a thirty minute social studies lesson.[14] In addition

to all this, during a normal school day students are exposed

to many textbook and examination questions. It can not be

doubted, then, that questions do in fact frequently occur

during the teaching process.

The question still remains, however, whether someone

could teach although no questions were asked. In Explaining,

Understanding, and Teaching Jane Martin poses the following

scenario:

> Suppose someone wanted his pupil to learn, organized
> the subject matter so as to maximize the likelihood of
> his learning, tried to get the pupil to want to learn,
> provided him with varied assignments and classroom
> activities, and helped him when he needed help, but in
> all this no...questioning occured. Would we not still
> describe him as teaching? What seems to me to be es-
> sential to teaching is not that questioning...occur but
> that it could occur if the appropriate situation were
> to arise.[15]

Questioning, then, is not necessary to teaching (witness the

professors who lecture exclusively to very large classes or

television audiences), but a refusal to entertain questions

---

[13]J. R. Moyer, "An Exploratory Study of Questioning
in the Instructional Processes in Selected Elementary Schools"
(Ph.D. dissertation, Columbia University, 1966).

[14]J. E. Schreiber, "Teachers' Question-asking
Teachniques in Social Studies" (Ph.D. Dissertation, Univer-
sity of Iowa, 1967).

[15]Martin, Explaining, p. 99.

in appropriate situations is in essence a refusal to teach.

Even though questioning is not a necessary condition for teaching, it is in fact a common teaching tool. The ancient Socratic dialogue with its heavy dependence on questioning is still widely admired as a masterful teaching technique, and is looked upon by many as a model to be emulated. Thus, there is a good deal of empirical justification for a study of the use of questions in teaching.

An Outline of the Remainder of this Study

The second, third, and fourth chapters of this study examine three aspects of the logic of classroom questions. The second chapter considers the problem of the logical status of questions--whether questions are reducible to one or a set of other sentence types (i.e., statements, commands, or -exclamations)--and includes an ordinary language analysis of the concept of 'question' as well as a stipulation of how 'question' is used throughout this study. The purpose of chapter two is to lay some logical groundwork in order to avoid some logical problems that could arise in chapters three and four. The third chapter contains a list of characteristics that can be used to judge whether or not a teacher's questions are logically sound. In addition to considering the viability of clarity, ambiguity, vagueness, syntactic combinability, presuppossitions, and answerability as criteria by which to evaluate classroom questions, the third chapter discusses the meaningfulness of metaphysical

questions. The fourth chapter examines the logic of class-
room question classification systems and how these kinds of
systems can be used to improve teachers' questioning tech-
niques. Two existing systems are analyzed, one devised by
B. S. Bloom and another by B. O. Smith and M. O. Meux, and an
alternative system constructed by the author is introduced.
Finally, the fifth and concluding chapter contains a summary
of this study and some recommendations for future research on
the logic of classroom questions.

Chapter 2

THE LOGICAL STATUS OF QUESTIONS

The purpose of this chapter is to lay some logical groundwork in order to avoid some logical problems that could arise in chapters three and four. Chapter three considers the logical characteristics of classroom questions and chapter four examines classroom question classification systems. It seems clear that before these two tasks can be accomplished, a prior question must be answered--namely, What is a question? That is, it is important to determine what kinds of things are going to count as questions, before determining their desirable logical characteristics or classifying them. This is by no means an easy task, but clarifying the notion of 'question' is a prerequisite to a study aimed at improving classroom questioning techniques.

Accordingly, this chapter is devoted to a consideration of the logical status of questions. The first section examines two attempts to reduce questions to other sentence types (i.e., statements or commands). The second section analyzes the relationship between questions and the other sentence types (i.e., statements, commands, and exclamations). The third section re-examines a controversy discussed in the

first section in light of the conclusions reached in the second section, and also discusses how the concept of 'question' will be used throughout the remainder of this study. Finally, a summary of this chapter and some recommendations for future research are contained in the fourth and last section.

The Reduction of Questions to Other Sentence Types

Until about ten years ago philosophers writing on questions commonly began their discussions by complaining that philosophers in general had not given this subject enough attention. So, although the study of questions as logical entities was initiated by Aristotle,[1] pursued in the Middle Ages by Adam of Balsham,[2] and in the nineteenth century by Richard Whately,[3] most of the important philosophical work on the subject is very recent.[4]

---

[1]Aristotle, Interpretation, 20b37-31, and Sophistical Refutations, 167b39-168a12.

[2]Adam of Balsham, Ars Disserendi, in ed L. Minio-Paluello, Twelfth Century Logic, Texts and Studies (Rome: Edizioni di Storia e letteratura, 1956), Vol. 1.

[3]Richard Whately, Elements of Logic (London: B. Fellowes, 1826).

[4]Some of the more important recent works are Lennart Aqvist, A New Approach to the Logical Theory of Interrogatives (Uppsala, N. J.: Uppsala University Press, 1965); Nuel D. Belnap, Jr., An Analysis of Questions: Preliminary Report (Santa Monica, California: Systems Development Corporation, 1963); Rudolf Carnap, Logical Syntax of language, trans. Amethe Smeaton (London: K. Paul, Trench, Trubner and Company, Ltd., 1937); Dale Elliot, "The Grammar of Emotive and Exclammatory Sentences in English" (Ph.D. dissertation,

In spite of this recently improved situation some basic, unresolved controversies about questions still remain. For example, there have been a number of attempts by various philosophers to reduce questions to other sentence types (types of utterances). Many different classification systems for sentence types have been devised over the years. Jespersen notes that in 1918 Brugman proposed eight separate types, with each type having up to eleven sub-classes. Jespersen finds it difficult to see the rationale of such an elaborate system, and suggests that the older classification system--including only statements, questions, commands, and

The Ohio State University, 1971); C. L. Hamblin, "Questions Aren't Statement," Philosophy of Science 30 (1963): 62-63; David Harrah, Communication: A Logical Model (Cambridge: M.I.T. Press, 1963); Harold Jeffreys, Theory of Probability, 2d ed. (Oxford: Clarendon Press, 1948); Noriko McCawley, "Boy! Is Syntax Easy!" Papers from the Ninth Regional Meeting Chicago Linguistic Society (Chicago: n.p., 1973), pp. 369-377; Gilbert Ryle, "Categories," PAS 38 (1937): 189-206; Jerold M. Sadock, "Speech Act Idioms," Papers from the Eighth Regional Meeting Chicago Linguistic Society (Chicago: n.p., 1972), pp. 329-339, and "Whimperatives," Studies Presented to Robert B. Lees by His Students (Edmonton, Alberta, Canada: n.p., 1970), pp. 223-238; John R. Searle, Speech Acts (London: University Press, 1969); Ludwig Wittgenstein, Philosophical Investigations, trans. G. E. M. Anscombe (Oxford: Basil Blackwell, 1953), secs. 23-24; Bertram Bandman, "What Makes and Educational Question Right or Wrong?" Philosophy of Education 1967: Proceedings of the Twenty-Third Annual Meeting of the Philosophy of Education Society, pp. 127-140; C. J. B. Macmillan, "Questions and the Concept of Motivation," Philosophy of Education 1968: Proceedings of the Twenty-Fourth Annual Meeting of the Philosophy of Education Society, pp. 239-251; Jane R. Martin, Explaining, Understanding, and Teaching (New York: McGraw-Hill Book Company, 1970), pp. 60-110; Sylvan Bramberger, "Questions," Journal of Philosophy 63 (October 27, 1966): p. 598.

exclamations[5]--is much clearer.[6] It will be shown later
that the boundaries between these four types are not entirely
distinct either, but they are generally accepted by philoso-
phers attempting to reduce questions to other sentence types
and thus provide a suitable place to begin. The remainder
of this section is divided into two sub-sections; the first
examines the reduction of questions to statements and the
second considers the reduction of questions to commands.

The Reduction of Questions to Statements

The main concern of some philosophers seems to be to
reduce questions to statements of some kind. Thus, Jeffreys
wrote that "Is Mr. Smith at home?" is equivalent to the trio
of statements "I do not know whether Mr. Smith is at home.
I want to know whether Mr. Smith is at home. I think you
know whether Mr. Smith is at home."[7] This attitude comes
under attack from Hamblin who points out that Jeffreys'
analysis is clearly inadequate in the case of "exam"
questions.[8] Exam questions are questions that teachers ask
for the purpose of testing a student even though the teacher
already knows the answer. A history teacher might ask, for
example:

---

[5]See for example C. T. Onions, An Advanced English
Syntax (London: Routledge and Kegan Paul, 1969), p. 3.

[6]Otto Jespersen, The Philosophy of Grammar (New York:
W. W. Norton and Company, Inc., 1965), p. 301.

[7]Jeffreys, Probability, p. 378.

[8]Hamblin, "Questions," p. 62.

1.) Who was the first President of the United
States?

According to Jeffreys this question can be reduced to:

2.) I do not know who was the first President of
the United States?

3.) I want to know who was the first President of
the United States.

4.) I think you know who was the first President
of the United States.

Clearly, (1) need not entail (2). Indeed, teachers
commonly know the answers to many (if not most) of the
questions they ask during a normal school day. In addition,
(1) need not entail (3). That is, the teacher who asks (1)
does not want to know who was the first President of the
United States (he already knows), but rather he wants to
determine if the student he directed the question to knows
the answer. Furthermore, (1) need not entail (4). Teachers
don't always ask questions of students who they think know
the answer. The purpose of an exam question is to find out
who knows the answer and who doesn't. Asking questions of
students who the teacher thinks do not know the answer is a
favorite ploy.

Exam questions, then, do not entail any of the state-
ments in Jeffreys' analysis. In order to save his analysis,
Jeffreys would have to deny that exam questions are really
questions. However, there seems to be no compelling reason
to take that position. Instead of arbitrarily excluding one
particular kind of question--namely, exam questions--to save

Jeffreys' analysis, it would be better to reject his analysis on the grounds that it does not follow ordinary language and conclude that thus far no one has shown that questions can be reduced to statements.

The Reduction of Questions to Commands

Another group of philosophers have attempted to reduce questions to commands. Searle, for example, claims that while questions and commands have different grammatical forms, there are no logical differences between them. He argues that asking questions is really a special case of requesting-- either requesting information (a "real" question) or requesting that the hearer display knowledge (an "exam" question).[9] Searle contends that this explains why an utterance of the request form, "Tell me the name of the first President of the United States," is equivalent in force to an utterance of the question form, "What's the name of the first President of the United States?" It also partly explains, Searle says, why the verb 'ask' covers both requests and questions, e.g., "He asked me to do it" (request) and "He asked me why" (question).[10]

Searle's view has been challenged by Bandman, who argues that it fails to account for the use of questions to

---

[9]Note that Searle is tacitly agreeing with the conclusion of the preceeding sub-section that exam questions are indeed questions.

[10]Searle, Speech Acts, pp. 66-69.

express doubt, bewilderment, bafflement, or puzzlement,

Bandman offers as counter-examples to Searle's analysis the

question that Mitya asks in The Brothers Karamazov, "Why are

they so poor?" or Job's question, "Why must I suffer?" or

the question an anguished mother asks about her dying son,

"Why did this have to happen to him?"[11]

Clearly, Bandman's counter-examples are not exam

questions, and they appear to be more like expressions of

emotion than requests for information. Thus, if Searle's

analysis is to be saved, Searle must deny that Bandman's

counter-examples are really questions. The only apparent way

to do this with any kind of consistency is to classify

Bandman's counter-examples as exclamations instead of questions.

This is not an altogether unreasonable move since they do

seem to function like exclamations--that is, they express

emotions. However, this means that sentences must be classi-

fied according to how they function, not according to their

form. Thus, a question mark at the end of a sentence is no

longer a guarantee that the sentence is a question. It

appears that the resolution of the Searle/Bandman dispute

hinges on how sentences are classified--on the basis of form

or function. Before coming to a conclusion about this con-

troversy, then, it is important to retrace some steps and

re-examine the four sentence types.

---

[11]Bandman, "Educational Question," p. 134.

The Relationship between Questions and Other Sentence Types

In an effort to clarify the boundaries of the four generally accepted sentence types the first sub-section of this section draws a distinction between sentence form and sentence function. Using this distinction the relationships between questions and statements, questions and commands, and questions and exclamations, are examined in the second, third, and fourth sub-sections respectively. The fifth sub-section presents some conclusions about the relationship between questions and other sentence types drawn from the first four sub-sections.

Sentence Form Vs. Sentence Function

Lennart Aqvist notes that the traditional answer to the question "What is a question in ordinary English?" has been that it is a sentence with certain characteristics such as inversed order of subject and verb, sometimes presence of special words like 'what', 'which', 'when', 'how', and so on. However, Aqvist argues that neither is it true that all such sentences are questions, nor is it true that only sentences belonging to this grammatical category are questions. He offers as examples:

5.) Will you close the window, please?

6.) I presume that this is Dr. Livingstone.

Where in most contexts (5) is likely to be understood as an order or command--politely disguised, of course--rather than a question, while (6), in spite of being a statement, might

naturally be classified as a question in appropriate cir-
cumstances.[12] This leads Aqvist to draw a distinction
between primary and secondary uses of the different sentence
types. The primary use of questions is eliciting information
via an answer, while the primary use of statements is making
assertions. In the two examples above the secondary uses of
the two sentence types are being emphasized. Moreover,
rhetorical questions such as:

  7.) O Death, where is thy sting?

which call for no answer but serve to express an emotional
attitude towards death on the part of the speaker are also
classified as secondary uses of questions.[13]

  The thrust of Aqvist's discussion is that the four
generally accepted sentence types do not have distinct
boundaries--in fact, they overlap to a great degree.
Aqvist's distinction between primary and secondary uses of
the various sentence types is well-taken, but another more
fruitful way to get at the same point is the distinction
between sentence form and sentence function. The various
sentence functions can be defined as follows:

  I. Question/Interrogative--requesting information,
   A. Is this Dr. Livingstone?

---

[12]Clearly, a change in context could have a crucial
effect when considering any example. Following Aqvist, all
examples in this study are to be considered context free
unless otherwise specified.

 [13]Aqvist, New Approach, pp. 46-47.

    II.   Statement/Declarative--asserting
          A.   This is Dr. Livingstone.

    III. Imperative--ordering or commanding
          A.   Close the window.

    IV.   Exclammatory--expressing emotion
          A.   What a beautiful day this is!

Sentences may also exhibit the following grammatical forms:

    I.   Question/Interrogative--verb, subject, object
          A.   Is Dr. Livingstone in the next room?

    II.   Statement/Declarative--subject, verb, object
          A.   I will close the window.

    III. Imperative--verb, object
          A.   Close the window.

    IV.   Exclammatory--object, subject, verb
          A.   What a beautiful day this is!

Thus, a second way to characterize (6) is to say that
it has a declarative form but an interrogative function.
Furthermore, (5) could be described as having an interrogative
form but an imperative function, and (7) as having an inter-
rogative form but an exclammatory function.

Normally, the function of any particular sentence will
parallel its form. Thus, the following sentence:

    8.)   This is a declarative sentence.
has both a declarative form and function. On the other hand,
there are numerous examples of sentences which do not have'
the same form and function--for example, (5), (6), and (7)
above.

In addition, some sentences have more than one function.
For example, suppose a newlywed husband on the morning after
the first night of his honeymoon asks his bride, "Was I the

first, darling?" and the bride responds:

> 9.) Why does everyone always ask me the same
>   question?

Obviously, (9) has the form of a question, but has two
distinct functions. One function is interrogative in nature--
the bride literally wishes to know the answer to her question--
and the second function is declarative--the bride informs her
husband that, alas and alack, he is not her first lover.

With the distinction between sentence form and
sentence function in mind, the relationship between questions
and the other generally accepted sentence types bears
examining.

Questions and Statements

Clearly, some sentences with the form of a statement
function like questions. Aqvist's second example (I presume
that this is Dr. Livingstone) is a case in point. This
particular kind of overlap between questions and statements
abounds in the classroom. Consider the following:

> 10.) I'm not sure I know what you mean.

> 11.) I wonder who knows the answer to number four.

> 12.) I asked you who was the first President of
>   the United States.

The three examples above, as well as (6), are all sentences
with a declarative form and an interrogative function. That
is, (6), (10), (11), and (12) are intended to be interpreted
in the following ways:

> 13.) Is this Dr. Livingstone?

14.) What do you mean?

15.) Who knows the answer to number four?

16.) Who was the first President of the United States?

Not only do some sentences with a declarative form function like questions, but some sentences with an interrogative form function like statements. The question/statement reponse of the bride in the previously mentioned anecdote is a good example of this. Many rhetorical questions have a declarative function. Sentences like:

17.) If we allow Medicare, can full-fledged socialism be far behind?

are not requesting information, but making an assertion, in this case:

18.) Medicare will lead to full-fledged socialism.

Some teachers are notorious for asking rhetorical questions. A common way to do this is to add phrases like isn't it," "couldn't we," "right," etc., on the end of statements and then not bother to wait for an answer. Often, a teacher will ask a number of these kinds of rhetorical questions in rapid fire order:

19.) Those are even numbers, aren't they?

20.) We could erase this numeral, right?

21.) So that tells us that the number is prime, doesn't it?

Thus, questions and statements overlap to a considerable degree with some sentences have declarative forms and interrogative functions and others having interrogative forms

and declarative functions.

Questions and Commands

Some clear examples of sentences with both the form and function of commands are:

22.) Open the window.

23.) Get out your math books.

24.) Square 36.

25.) Spell 'antithesis'.

Sometimes, sentences with interrogative forms are intended to function like imperatives. For example:

26.) How about a drink?

27.) Won't you give me a drink?

28.) Do you have anything to drink?

29.) What do you have to drink?

30.) Isn't this a great day for a gin and tonic?

could all be interpreted as a command, namely:

31.) Give me a drink.

In addition, some sentences with interrogative forms are functionally ambiguous and could have either an interrogative or an imperative function. Thus:

32.) Why don't you draw it this way?

could be interpreted as having an interrogative function:

33.) Tell me, what reasons do you have for not drawing it this way?

or an imperative function:

34.) Draw it this way.

Furthermore, (32) could be interpreted as the disjunction of (33) and (34):

> 35.) Either draw it this way, or give me some reasons why you shouldn't.

or the conjunction of (33) and (34):

> 36.) Draw it this way, and tell me why you have so far neglected to do so.

Thus, we have four very different possible interpretations of (32), and it may not be easy to tell which is the one intended in any particular situation.

These kinds of functionally ambiguous questions abound in the classroom. Some common examples are:

> 37.) Why aren't you working?

> 38.) Would you like to read the next problem?

Functional ambiguity can lead to a breakdown in communications between teacher and student. A student could interpret (37) and (38) as having an interrogative function and accordingly attempt to verbally answer them, while the teacher intends them to have an imperative function and expects no verbal answer. Sometimes, the teacher will then cut the student short and indicate the intended imperative function by issuing a curt command:

> 39.) Shut up and get to work.

> 40.) I said, read the next problem.

This would indicate that (37) and (38) are intended to be what is commonly referred to as rhetorical questions. A possible end result of all this misunderstanding is an ever-

increasing strain on the teacher/student relationship, with the student becoming wary of a teacher who doesn't always say what he means, and the teacher categorizing the student as a troublemaker. In any event, it is clear that some sentences with an interrogative form function like imperatives.

Conversely, it is common in education to refer to sentences like:

41.) Explain how a bill becomes a law.

42.) Describe the structure of the United Nations

which have the form of a command, as questions. Indeed, (41) and (42) are clear cases of "exam" questions--requests for students to display knowledge.

So, not only do sentences with interrogative forms sometimes function as imperatives, but sometimes sentences with imperative forms function like interrogatives.

Questions and Exclamations

Some paradigm examples of sentences with both an exclammatory form and function are:

43.) What an attractive woman she is!

44.) How beautiful this mountain is!

Sometimes, sentences with an interrogative form have an exclammatory or a combination exclammatory/interrogative function. For example:

45.) What the hell's going on?!

In the above example, the speaker wishes to acquire some information about what is taking place (interrogative

function), and at the same time expresses his emotional dis-approval (exclammatory function).

Other common educational examples similar to (45) are:

46.) Is that necessary?!

47.) Do I have to tell you to behave?!

The two examples above could be interpreted as having an interrogative:

48.) Tell me, is that necessary?

or an exclammatory function:

49.) How upsetting your behavior is!

or both, depending on the intonation. A rising intonation would mark (46) and (47) as having interrogative functions, while a falling intonation would indicate an exclammatory function is intended. Sentences like (46) and (47), when intended as exclamations are yet another kind of rhetorical question.

Usually, there is no difficulty distinguishing questions from exclamations, but that is not always the case when the interpretation depends on intonation. It is a familiar experience to interpret a sentence literally when it was intended to be sarcastic, or vice versa. Similarly, it is possible to misinterpret the intended function of sentences like (46) and (47). Again, the end result of this question/exclamation ambiguity is misunderstanding between teacher and student.

Conclusions

From the discussion of the previous four sub-sections, the following conclusions become apparent:

    I.   Sentenceswith an interrogative form can function as interrogatives, declaratives, imperatives, exclamations, or any combination thereof.

    II. Sentences with declarative, imperative, or exclammatory forms can function as interrogatives.

    III. Some sentences with interrogative forms are functionally ambiguous, and it may be impossible to tell, even in context, which function is intended.

Having arrived at these conclusions it is now possible to analyze the concept of 'question' with greater insight.

The Concept of 'Question'

This section is divided into two parts; the first re-examines the Searle/Bandman dispute and the concept of 'question' in light of the conclusions reached above, and the second cites some pedagogical reasons for using the term 'question' in its broadest possible sense throughout the remainder of this study.

The Searle/Bandman Dispute

In the section on the reduction of questions to other sentence types Searle argued that questions are simply one kind of command--either requests for information ("real" questions) or requests that the hearer display knowledge ("exam" questions). Bandman, on the other hand, claimed that

this is an inadequate analysis on the grounds that it fails

to account for questions that express doubt, bewilderment,

bafflement, or puzzlement (e.g., Why must I suffer?, Why did

this have to happen to him?, etc.).

It appears that Searle and Bandman are talking past

one another because of their failure to recognize the sentence

form/sentence function distinction. Searle's analysis is

correct with respect to the interrogative function. That is,

requests for information and requests that the hearer display

knowledge are simply one special class of requests. Thus,

the interrogative function is simply one kind of imperative

function. On the other hand, Bandman's argument is sound if

the issue is the interrogative form. Clearly, sentences with

an interrogative form can have functions other than interro-

gative. Indeed, this class of sentences--sentences with an

interrogative form and an imperative, declarative, or

exclammatory function--are what is generally referred to as

rhetorical questions (questions to which no answer is ex-

pected).

The resolution of the Searle/Bandman dispute rests,

then, on whether rhetorical questions are really questions.

Bandman obviously thinks they are, while Searle suggests they

are not. This disagreement reflects the impreciseness

associated with the concept of 'question'. In ordinary use

of the word 'question' much shifting back and forth between

the two positions mentioned above takes place--some people

would agree with Searle, others with Bandman, and still
others would vascillate between the two. Logically, there
seems to be no clear-cut reason for coming down squarely in
favor of one use and not the other. However, there are good
pedagogical reasons for using 'question' in the broadest
possible sense--following Bandman--throughout the remainder
of this study. These reasons are spelled out in the
following sub-section.

The Use of 'Question' in this Study

        The purpose of this study is to improve teachers'
questioning techniques through an examination of the logic of
classroom questions. If the concept of 'question' were re-
stricted to sentences with interrogative forms, then sentences
like (41) and (42):

        41.) Explain how a bill becomes a law.

        42.) Describe the structure of the United Nations.
which have an interrogative function but an imperative form,
would be excluded from this study. Clearly, the class of
sentences represented by (41) and (42) are commonly employed
in the classroom, and thus it is important pedagogically
that they be considered questions so as to include them as
one category which can be examined in this study.

        Similarly, if 'question' is restricted to sentences
with interrogative functions then sentences like:

        32.) Why don't you draw it this way?!

        46.) Is that necessary?!

if interpreted as having imperative and exclammatory functions respectively would be omitted from this study. Again, these kinds of sentences are very common in education and deserve to be examined.

Allowing sentences with either an interrogative form or function to count as questions permits this study to examine a wider range of classroom questioning behavior. Thus, the word 'question' will be used to designate 'sentences with either an interrogative form or function' throughout the remainder of this study.

Conclusion

This section is divided into two sub-sections; the first contains a summary of this chapter, and the second contains some recommendations for future research.

Chapter Summary

The purpose of this chapter was to lay some logical groundwork in order to avoid some logical problems that could occur in chapters three and four. Accordingly, the first section of this chapter examined two attempts to reduce questions to other sentence types. It was concluded that questions could not be reduced to statements, but a decision was temporarily postponed on whether questions were reducible to commands. The second section analyzed the relationships between questions and other sentence types in light of the distinction between sentence form and sentence function.

It was decided in the third section that the interrogative
function was reducible to the imperative function, but that
for pedagogical reasons 'question' would mean 'any sentence
with either an interrogative form or function' throughout
the remainder of this study.

Recommendations for Future Research

The analysis presented in the preceding pages should
be considered not as a final product, but rather as a starting
place for future discussions of the logical status of questions.
Much conceptual work remains to be done before any analysis
of the concept of 'question' can be called adequate. If the
recent emphasis on erotetic logic (the logic of questions)
continues great strides can perhaps be made in an effort to
improve and refine and subject matter of this chapter.

Chapter 3

THE LOGICAL CHARACTERISTICS OF CLASSROOM QUESTIONS

It has long been observed that some questions are
just not very good questions. The following anecdote has
been attributed to Plutarch:

> In this voyage (Alexander) took ten of the
> Indian philosophers prisoners ... These men
> because they go stark naked, are called Gymnosophists,
> and are reputed to be extremely sharp and succinct
> in their answers to whatsoever is propounded to
> them, which (Alexander) made trial of, by putting
> difficult questions to them, withal letting them
> know, that those whose answers were not pertinent
> should be put to death ... Of the fifth
> (gymnosophist) he asked, Which was eldest,
> Night or Day? The philosopher replied, Day was
> eldest, by one day at least; but perceiving
> Alexander not well satisfied with that account,
> he added, that he ought not to wonder, if strange
> questions had as odd answers made to them.[1]

The moral of this story is clear enough--ask a foolish

question and you get a foolish answer.

Educators have not ignored the importance of this
moral. Almost three decades ago Wendell Johnson made these
comments in the Journal of General Education:

> It is known almost as widely as it is
> disregarded that a fool is one who knows the
> answers to the questions that only a fool
> would ask. It follows that effective insurance
> against becoming a fool oneself lies in know-

---

[1]Plutarch, "The Life of Alexander," Plutarch's Lives,
trans. Mr. Evelyn (London: Jacob Tonson, 1699), 4: 331-332.

ing what sorts of questions and answers these might be. It would appear reasonable to assume, on this basis, that a major responsibility of our schools and colleges is that of providing adequate instruction in the techniques of fruitful inquiry.[2]

More recently, Bertram Bandman, in the opening paragraph of an article published in 1967 noted that there is a commonsense belief, both in education and in other fields that, as expressed by John Dewey, "a question well put is already half-answered."[3] Bandman goes on to point out that the field of education would profit enormously if there were criteria for evaluating questions. He then devotes the rest of his paper to searching for characteristics that "right" questions exhibit. The pedagogical reason, Bandman says, for looking for these characteristics is that it will become possible to correct a teacher (or student, as the case may be) who asks a "wrong" question, in the same way as someone who makes a false statement is corrected.[4] The pedagogical significance of an examination of the logical characteristics of classroom questions thus seems clear enough.

---

[2]Wendell Johnson, "How to Ask a Question," The Journal of General Education 1 (April 1947): 206.

[3]John Dewey, How We Think (Boston: Heath, 1933), p. 108.

[4]Bertram Bandman, "What Makes an Educational Question Right or Wrong?" Philosophy of Education 1967: Proceedings of the Twenty-Third Annual Meeting of the Philosophy of Education Society, pp. 127-128.

Introduction

Before proceeding further, it is important to re-
cognize that there are at least two different ways to evaluate
classroom questions.

The Activities of Teaching

It was noted in chapter one that Thomas F. Green has
divided the activities that teachers perform into three
categories--institutional activities, strategical activities,
and logical activities. Institutional activities (e.g.,
collecting money, taking attendance, patrolling the hall, etc.)
are required of teachers, not by the nature of teaching, but
by the nature of the institution in which they hold a position
or office. Strategical activities (e.g., planning, disciplin-
ing, counseling, etc.) are those that have primarily to do
with the teacher's plan or strategy, the way the material is
organized or students are directed in the course of teaching.
Logical activities (e.g., defining, explaining, arguing, etc.)
are concerned primarily with thinking or reasoning in
teaching. Green points out that strategical activities are
appraised by their consequences for learning, while logical
activities are appraised on logical grounds independently of
their consequences for learning.[5]

---

[5]Thomas F. Green, The Activities of Teaching (New
York: McGraw-Hill Book Company, 1971), pp. 1-9.

The Evaluation of Questions

Questioning is an activity that seems to qualify as both a strategical activity and a logical activity. That is, questions can be evaluated on how well they work in the classroom (i.e., strategically), and on logical grounds (how well they are constructed, etc.) independently of how well they work in the classroom.

Of course, it seems reasonable to assume that a question, or any other logical activity, that is well-formed, contains no logical flaws, etc., is more likely to allow students to acquire knowledge than a poorly formed question. It should also be recognized that the pedagogical applications of this assumption are extremely broad in nature. That is, classroom discourse can be improved by improving the logical quality of teachers' questions, regardless of their subject-matter area, and of students' questions.

There already exists a considerable body of literature on the strategy of questioning.[6] For example, Richard Laughlin has proposed ten guidelines for improving classroom questioning techniques, and they are heavily weighted towards

---

[6]See for example Philip Groisser, How to Use the Fine Art of Questioning (Englewood Cliffs, N.J.: Prentice-Hall, Inc. 1964); Francis P. Hunkins, Questioning Strategies and Techniques (Boston: Allyn and Bacon, Inc., 1972); Harold Ladas and Louis Osti, "Asking Questions: A Strategy for Teachers," The High School Journal 56 (January 1973): 174-189; Richard L. Laughlin, "On Questioning," The Educational Forum 25 (May 1961): 481-482; Jack C. Morgan and Joan E. Schreiber, How to Ask Questions, How To Do It Series (Washington D.C.: National Council for the Social Studies, 1969); Norris M. Sanders, Classroom Questions: What Kinds? (New York: Harper and Row, 1966).

strategy:

I.   Distribute questions so that all, including the non-volunteers, are involved.
II. Balance factual and thought-provoking questions.
III. Ask both simple and exacting questions, so that the poorer students may participate and the brighter students may be extended.
IV. Encourage lengthy responses and sustained answers. ...
V.   Stimulate critical thinking by asking: "To what extent?" How?" "Under what circumstances?" "Why?" "Compare (or contrast)..."
VI. Use the overhead technique: (1) question, (2) pause, (3) name.
VII. Insure audibility, then refuse to repeat questions or answers.
VIII. If a student asks a question, don't answer it until you've asked the class, "How would you answer that question, ...?"
IX. Personalize questions ("Pretend you are ... What would you do?").
X.   Suggest partnership by inquiring, "How can we ....?"[7]

Unfortunately, there does not exist a correspondingly impressive body of literature on the logical characteristics of good questions.[8] Accordingly, the remainder of this chapter will be devoted to that area. The following six sections will consider 1.) clarity, 2.) ambiguity, 3.) vagueness, 4.) syntactic combinability, 5.) presuppositions, and 6.) answerability respectively as criteria for

---

[7]Laughlin, "On Questioning," pp. 481-482.

[8]Hunkins, Questioning Strategies, and Groisser, Art of Questioning, give this area passing mention, but other than an excellent article by Bandman, "Educational Question," and another fine article by C.J.B. Macmillan, "Questions and the Concept of Motivation," Philosophy of Education 1968: Proceedings of the Twenty-Fourth Annual Meeting of the Philosophy of Education Society, pp. 239-251, very little has been written in this area.

evaluating questions logically. The seventh and final section will provide a chapter summary and include recommendations for future research.

Clarity

A few educators have recognized the importance of asking clear, logical questions, but in general give little more than hortative advice about this topic.

Hunkins' Clarity Criterion

Hunkins, for example, states that criteria for effective questioning should include "criteria specifically relating to forming the questions."[9] However, the following questions, which he suggests teachers ask themselves to check this clarity dimension, are too vague to be of much use to the practicing teacher:

    I. Does the question's wording make clear what it expects, both cognitively and affectively, from the student?
    II. Does the wording of a question allow the student to respond with optimal productivity?
    III. Does the wording facilitate effective student functioning?[10]

Hunkins' advice is simply a verbose way of saying, "Ask good, clear, effective qeustions." That is indeed good advice, but it does not give the classroom teacher anything concrete to cling to. To answer the question, "What are the

---

[9]Hunkins, Questioning Strategies, p. 67.

[10]Ibid., pp. 67-68.

characteristics of well-formed questions?" with I, II, and

III above is to beg the question.

The problem with Hunkins' advice is well-illustrated

by the following passage from Scheffler's The Language of

Education:

> Rules for lion-hunting (we may imagine) tell
> hunters what they ought to do in trying to bag
> lions. Such rules cover the details of training,
> preparation, and the conduct of the hunt. One
> component set of such rules relating to the hunt
> may be supposed to be: "Aim your loaded gun at
> the lion; then, when the range and other conditions
> are right, pull the trigger." Let us assume that
> the hunter's knowledge and skill are excellent,
> that he follows this component set of rules as
> well as the other components, to the letter. It
> is still not guaranteed that some lion will be
> bagged; the lion may bound away at exactly the
> crucial moment. ...
>   It is always, to be sure, easy to formulate
> exhaustive rules that will not be helpful. To
> the lion-hunting rules already mentioned, we may,
> for example, add "Kill the lion." Anyone
> following the latter rule cannot fail to bag a
> lion, but it is ordinarily true that if he does
> not know how to bag a lion, neither does he know
> how to follow the rule. ... Similarly, to
> someone seeking advice on how to win a race we
> might say, "Arrive at the tape before any of the
> other runners," and to someone searching for a
> needle in a haystack we might say, "Locate the
> needle, then bend down and pick it up." Such
> rules are obviously of no help whatever in normal
> situations.[11]

Telling teachers wishing to improve their questioning

to "ask clear questions" is like telling hunters wishing to

bag a lion to "kill the lion;" it doesn't describe the steps

involved and is therefore not helpful.

---

[11]Israel Scheffler, The Language of Education
(Springfield, Illinois: Charles C. Thomas, 1960), pp. 70-71.

Groisser's Clarity Criterion

Groisser has also done some work on questions, both as logical activities and as strategical activities. Typically, most of his book is devoted to strategy, but he does devote some space to the logic of questions. Like Hunkins, Groisser recognizes the importance of asking clear questions. However, Groisser attempts to pin down more tightly the clarity criterion. He distinguishes two different categories of unclear questions--those that are vague and those that are ambiguous. According to Groisser, a vague question is "one that is not definite in statement or meaning," while an ambiguous question is "one open to various interpretations."[12] He cites as an example of a vague question:

1.) How do teeth grow?

and suggests that:

2.) What are some factors that influence the growth of our teeth?

is "clear and definite."[13] Similarly, he classifies:

3.) What comparisons do you see between Washington's Farewell Address and the Monroe Doctrine?

as an ambiguous question and states that:

4.) Why can we call both Washington's Farewell Address and the Monroe Doctrine cornerstones of U.S. isolation?

---

[12]Groisser, Art of Questioning, p. 21.

[13]Ibid., pp. 21-22.

is clearer.[14]

One problem with Groisser's advice is that it fails to clearly delineate vagueness and ambiguity, thereby causing more confusion than clarity. Sentence (1) above is ambiguous, not vague. It could be taken as a request for a description:

5.) Describe the process by which teeth grow.

or as a request for a cause:

6.) What causes teeth to grow?

Groisser's reformulation of (1) as (2) is clearer, not because it is less vague, but because it is less ambiguous--it asks for a cause, not a description.

Similarly, sentence (3) is not what is ordinarily called ambiguous, but rather it is vague. Indeed, Groisser's reformulation of (3) does not eliminate any ambiguity, but is simply more specific (less vague). The distinction between vagueness and ambiguity is by no means clear cut, but Groisser seems to have it hopelessly muddled. The following two sections will attempt to explicate this important distinction in much greater detail.

Before undertaking that task, however, one pedagogical point must be made. The thrust of Groisser's discussion seems to be that vague questions, like (3) above, are less desirable in the classroom than specific questions, like (4) above. Undoubtedly, specific questions are sometimes more desirable than vague questions, but they are not <u>always</u> more

---

[14]Ibid.

desirable. Some teachers, for example, might prefer in certain contexts to ask (3) rather than (4) because (4) gives away the point that they wish their classes to come to realize on their own. All of this is not to say that vagueness is always a desirable characteristic of classroom questions, but simply to point out that it is not necessarily undesirable. More will be said about this in the section on vagueness.

It appears that Groisser has fallen prey to the exact same problem that he is warning other teachers to avoid--being unclear. His clarity criterion, while a step in the right direction, does not contain the cutting edge that is necessary for it to be useful to the practicing educator. The following two sections will take up the notions of vagueness and ambiguity in an attempt to find that elusive cutting edge that is so necessary for a criterion to be pedagogical useful.

Ambiguity

The term 'ambiguous' is usually applied to words that have more than one meaning. The word 'snow', for example, can refer to 'frozen water' or 'cocaine'. When a question is ambiguous due to the presence of a contextually ambiguous word it will be classified as semantically ambiguous. However, this kind of ambiguity is only one of three kinds of ambiguity that questions can exhibit. After looking at semantically ambiguous questions in the next sub-section, the following two sub-sections will examine the other two kinds

of ambiguous questions--functionally ambiguous and syntactically ambiguous.

Semantic Ambiguity

Questions are semantically ambiguous when they contain a contextually ambiguous word. It is important, here, to recognize the distinction between conceptual ambiguity and contextual ambiguity.[15] Some words are ambiguous out of context, but when placed within the context of a question do not cause any confusion because it becomes clear which of the several possible meanings is intended. For example, the word 'trunk' is conceptually ambiguous because it can refer to 1.) the main storing compartment of an automobile, 2.) a suitcase or box, 3.) the main part of a tree, or 4.) an elephant's nose. However, if the owner of a stalled car were to ask:

7.) Do you have any jumper cables in your trunk?
it is pretty clear that the first meaning of 'trunk' listed above is intended. Thus, questions which contain conceptually ambiguous words, but not contextually ambiguous words, do not cause any problems.[16]

---

[15]See Green, Activities of Teaching, pp. 34-35, for a further elaboration of this distinction.

[16]It is interesting to note that a certain kind of comedy is based on interpreting words that would not normally be considered contextually ambiguous, as if they were. A famous Groucho Marx routine begins in a restaurant with the maitre d' asking Groucho, "Do you have any reservations, sir?" to which Groucho replies, "Yes, but I'm going to eat here anyway."

Unfortunately, not all conceptually ambiguous words are clarified when placed in context. For example, in (8):

8.) Explain the Civil War.

the word 'explain' is conceptually ambiguous because it could mean 1.) describe, 2.) give the cause, 3.) give the purpose, 4.) justify, or 5.) define. Furthermore, in (8) 'explain' is contextually ambiguous because the context gives no clue as to which of the five possible meanings is intended.

Some other examples of semantically ambiguous questions are:

9.) Why do animals grow long hair in the winter?

10.) How big is China?

It is not clear whether (9) is a request for a causal explanation (What causes animals to grow long hair in the winter?) or a teleological explanation (For what purpose do animals grow long hair in the winter?). Similarly, (10) could be interpreted either as a request for the area of China or the population of China.

The end result of asking semantically ambiguous questions is confusion. The situation in which a student is unsure which of several possible answers to a semantically ambiguous question a teacher desires is all too common. Indeed, if a student seems puzzled by a question, one of the things the teacher should check is whether the question is semantically ambiguous.

Functional Ambiguity

Semantic ambiguity is not the only kind of ambiguity that questions can exhibit. Certain questions are function-ally ambiguous. That is, it is not clear whether to interpret certain sentences with interrogative forms as having interro-gative, declarative, imperative, exclammatory, or some com-bination of the four sentence functions. Consider the following question:

11.) Why don't you draw it this way?

It is possible to interpret this sentence as having an interrogative function:

12.) Tell me, what reasons do you have for not drawing it this way?

an imperative function:

13.) Draw it this way.

a declarative function:

14.) It is my opinion that you ought to draw it this way.

an exclammatory function:

15.) How stupid you are not to draw it this way!

or any combination of (12), (13), (14), and (15).

Some other examples of this kind of ambiguous question are:

16.) Why won't this approach work?

17.) Why not try this method?

18.) Why aren't you working?

Questions like (11), (16), (17), and (18) leave the

student in a quandry, since it is not clear what kind of response (a verbal answer, an immediate obeying of a command, etc.) the teacher desires.

Similarly, there are those familiar situations in which students interpret certain questions as preference questions when in fact they are disguised imperatives. For example:

19.) Would you like to get out your math books?

20.) Johnny, would you like to read the next problem?

All too often a student will in good faith decline the offer only to be told in no uncertain terms that the "offer" was really a command, the whole episode resulting in the embarassment of the student which eventually leads to the distrust of the teacher.

In addition, some questions are meant to have an exclammatory or a combination exclammatory/declarative function instead of the normal interrogative function. For example, consider the following sentence:

21.) Is that necessary?

This sentence could be interpreted as a normal question requesting information via a verbal answer, or as having an exclammatory/declarative function such as:

22.) That is not necessary, and I will not tolerate it any longer!

The key to determining which interpretation is intended is the tone of the voice in which the sentence is uttered, but

this is not a completely reliable clue. It is not unusual for a student to attempt to respond to a question like (21) as if it had an interrogative function, only to arouse the teacher's wrath for not recognizing the intended exclammatory/ declarative function of the question. And vice versa, sentences like (21) are sometimes interpreted as having an exclammatory/declarative function with students claming up, when in fact the teacher intends it to have an interrogative function, expects it to elicit an answer, and instead encounters only disconcerting silence.

Clearly, functional ambiguity creates many situations in which students and teachers misinterpret each other. Thus, in order to improve teacher/student communication it would be wise to avoid questions that exhibit functional ambiguity.

Syntactic Ambiguity

There is yet a third kind of ambiguity that is characteristic of a certain class of questions--syntactic ambiguity. Some questions are ambiguous, not because of the presence of a contextually ambiguous word (semantic ambiguity), or because their function is not clear, but because of the way the words that form the question are arranged. One common kind of this latter form of ambiguity, which will be referred to as syntactic ambiguity, is due to a misplaced or dangling modifier and often results in humorous questions like the following:

23.) Will you please hand in your tests with

their answer sheets attached to me?

The above example is perhaps more humorous than confusing

but consider the following:

24.) When Booth killed Lincoln how old was he?

Due to the ambiguous reference of 'he' (Booth or Lincoln?)

in the above question it is not clear how to respond.

Like semantic and functional ambiguity, syntactic

ambiguity can result in equivocation, confusion, people

talking past one another, and a general breakdown in

communication. So, a third characteristic to avoid when

trying to construct good classroom questions is syntactic

ambiguity.

Vagueness

Like ambiguity, vagueness can be further subdivided.

The following two sub-sections examine two kinds of vagueness

that questions sometimes exhibit--semantic vagueness and

syntactic vagueness.

Semantic Vagueness

Some questions are vague due to the presence of a

vague word, and this will be referred to as semantic vague-

ness. Vague words are words whose boundaries of application

are unclear. The term 'rich' is a paradigm example of a

vague word. Clearly, some people are rich (e.g., Howard

Hughes) and others are not rich (e.g., most graduate stu-

dents), but at the same time there are many people who are

borderline cases. Even though it is known exactly how much money they have, it is not clear whether or not they qualify as being rich because of the imprecise nature of the word 'rich'. (Is $1,000,000 rich? $100,000? $10,000?)

Semantic vagueness is not always undesirable. Indeed, it provides our language with the flexibility needed to avoid becoming overly complex. In addition, semantically vague questions are sometimes pedagogically useful. For example, the following question:

> 25.) How many people in here want to grow up to be rich and famous?

although containing two vague words, 'rich' and 'famous', would not normally create any problems. So semantically vague questions are not necessarily bad questions. They only become problematic if they are used as if they were not semantically vague. Thus, to ask a semantically vague question like:

> 26.) Is President Ford rich?

as if it were precise and could be answered with a simple yes or no is to ask a bad question.

On the other hand, a teacher might recognize the semantic vagueness in a question and still ask it in an attempt to illustrate the importance of asking prior or meta-questions. Prior questions are questions that need to be answered before the original question can be answered. For example, the following question:

> 27.) Is the United States a democracy?

might be asked in the hopes of generating a discussion about what counts as a democracy (direct democracy vs. representative democracy).

Again, the important point is not that semantically vague questions should never be used in the classroom, but that semantically vague questions should always be recognized as such.[17]

Syntactic Vagueness

Vagueness is normally attributed only to words, but some questions are vague due to the structure of the questions. This will be referred to as syntactic vagueness. These kinds of vague questions are very general in nature. Consider the following:

28.) What have we learned today?

This question seems to be a common one, and yet its lack of specificity makes it a model case of syntactic vagueness. Some other examples of syntactically vague questions are:

29.) What do you know about electricity?

30.) What can you say about Korea?

31.) What about the League of Nations?

The above questions may also be semantically ambiguous, but even when the ambiguity is removed as in the following revision of (29):

---

[17]It should be noted that vagueness and ambiguity often occur together. They are separated in this study in the hopes of better understanding two different problems.

32.) Describe how electricity works.

some syntactic vagueness still remains. It should be realized that syntactic vagueness is largely relative, and thus:

33.) Describe how electricity makes a light bulb work.

is less vague than (32), but even still retains some syntactic vagueness.

As with semantic vagueness, syntactic vagueness becomes problematic only when it is not recognized. In fact, sometimes syntactically vague questions are pedagogically preferable to specific questions. As noted in the section on clarity, some teachers may prefer to ask:

3.) What comparisons do you see between Washington's Farewell Address and the Monroe Doctrine?

rather than:

4.) Why can we call both Washington's Farewell Address and the Monroe Doctrine cornerstones of U. S. isolation?

because (4) gives away the point that the teacher wishes his class to realize on their own. However, if a teacher asks a question that stumps his class, one of the things he should check for is syntactic vagueness. Constructing a more specific question might result in more answers being volunteered.

Richard Pratte describes two techniques that semanticists use to be more specific:

1. Indexing: In the framework of general semantics no one thing enjoys absolute identity with another. This we have called the principle of nonidentity. Hence we index to indicate

differences. Since one dog differs from another dog or one chair from another or one student from another, we index: dog_1, dog_2, dog_3, etc.; $chair_1$, $chair_2$, $chair_3$, etc.; $student_1$, $student_2$, $student_3$, etc.

    2. <u>Dating</u>: The term used in general semantics to describe the process of noting changes produced in people or things by time. General semanticists suggest that people frequently ignore the fact that change is basic in human behavior and indeed in all life. Thus subsequent evaluations of people and one's environment represent static rather than dynamic perception. The formulation known as dating states that if our evaluations and our statements about our environment are to be accurate, they must take into consideration the fact that both man and his environment are changing from moment to moment. Obviously L. $Wittgenstein_{1922}$ is not exactly the same person as L. $Wittgenstein_{1950}$. Nor is Columbia $University_{1960}$ exactly the same as Columbia $University_{1968}$. Likewise, teacher first class period differs from teacher sixth class period. Dating behavior, then, would force the individual to take cognizance of the reality of change, to evaluate constantly his environment, and to make verbal utterances which fit the life facts as they exist for him at the moment.[18]

Thus, the question:

    34.) Were President Nixon's policies any good? can be rendered less vague by indexing which policies are being referred to (e.g., domestic vs. foreign affairs) and by dating ($Nixon_{1971}$ vs. $Nixon_{1974}$).

Syntactic Combinability

    Bandman, in his article "What Makes an Educational Question Right or Wrong?" lists three ways to evaluate the logical characteristics of questions. The first concerns

_____

[18]Richard Pratte, <u>Contemporary Theories of Education</u> (Scranton, Pennsylvania: Intext Educational Publishers, 1971), p. 320.

the syntax of questions, the second concerns their presuppo-
sitions, and the third their uses.[19] This section examines
the first criterion, while the second and third criteria are
taken up in the following two sections.

One way to judge whether a question has something
wrong with it is by determining if the expressions of the
question are logically miscoupled or syntactically incombin-
able. Bandman does a good job of introducing and illustrating
this criterion, but his organization and explanation leave
something to be desired. The following two sub-sections
delineate and explicate two different kinds of questions that
exhibit syntactic incombinability--nonsense syllable questions
and questions that contain category mistakes. Bandman dis-
cusses both of these kinds of questions, but fails to sharply
distinguish between the two and simply lumps them both under
the general heading of syntactic incombinability.

Nonsense Syllables

It seems obvious that a question made up of nonsense
syllables is meaningless and thus a defective question. For
example:

35.) Gove matahu salenor?

is clearly an illogical question due to the fact that it is
made up entirely of nonsense syllables. A question need not,
however, be made up entirely of nonsense syllables to be

---

[19]Bandman, "Educational Question," pp. 127-140.

meaningless. Consider the following examples:

    36.) Do pirots carulize alactically or furbally?

    37.) Why are mambols so unruly?

Thirty-six seems to have the form of a question, and (37)

contains only one nonsense syllable (mambols), yet they both

qualify as meaningless questions.

    Bandman also includes in this category certain kinds

of, but not all, metaphysical questions. He cites as

examples of meaningless metaphysical questions:

    38.) Is the good more or less identical to the
          beautiful?

    39.) Did the Absolute pegasize itself today?

    40.) Does the nothing nothing itself?

but gives no reasons why they are meaningless.[20]

    It seems clear that (39) qualifies as a nonsense

syllable question because it contains the nonsense syllable

'pegasize'. Furthermore, (40) would also qualify because of

the two unusual uses of 'nothing'. In ordinary language the

word 'nothing' is not used as a name. 'Nothing' is used as

the subject of some sentences, as in "Nothing is better than

sex," but 'nothing' does not name anything in this sentence.

We could, for example, say the same thing without using the

word 'nothing'--"Sex is the best thing in the world." Thus,

the phrase 'the nothing' in (40) is a nonsense syllable. In

addition, the word 'nothing' is also used as a verb in (40),

but it is difficult if not impossible to understand what it

_____

    [20]Ibid., p. 129.

means to 'nothing' something. Thus, due to these two mean-
ingless expressions containing 'nothing', (40) can be class-
ified as a nonsense syllable question. Similarly, (38) con-
tains two phrases, 'the good' and 'the beautiful', which
render it meaningless since no clues are given as to what
they name. It should be noted, on the other hand, that it
may be possible that questions like (38), (39), and (40)
become meaningful when placed in context. However, until an
understandable interpretation of these questions is provided,
they must be considered nonsense syllable questions.

The end result of asking nonsense syllable questions
is total confusion. Moreover, it is a matter of fact that
"metaphysical" questions similar to (38), (39), and (40) do
occur and cause confusion in philosophy of education. The
problem of whether all metaphysical questions are meaningless
will be put off until a later section which examines answer-
ability as a criterion for evaluating questions. However, it
is clear that some metaphysical questions are nonsense syl-
lable questions, and as such are defective due to their
meaninglessness.

Category Mistakes

Some questions are defective because of the combina-
tion of two or more constructs that belong to different
logical categories. This characteristic will be referred to
as a category mistake. There is something logically wrong
with certain questions like:

41.)   What color is Thursday?

Clearly, the person who utters (41) does not understand the
language. Days do not have colors, except perhaps in certain
stories where syntactical rules are temporarily waived (e.g.,
Alice in Wonderland). The difference between these figura-
tive uses of language and category mistakes lies in the in-
tent of the utterance. If two terms that belong to different
logical categories are purposely combined then the result is
figurative language. However, if they are unknowingly or
unwittingly combined (i.e., intended to be literal uses) then
the result is a category mistake.

Bandman illustrates the pedagogical importance of this
criterion by pointing out that:

> We do in fact appeal to these syntactical
> considerations to teach children what questions
> to ask and what not to ask. When, for example,
> a child asks, "Who brought me, the stork?" a
> parent may answer, "No one brought you. You were
> born." Or to the question, "Who made me?" though
> grammatically correct, it may be corrected by a
> parent or teacher instructing the child that
> tables, chairs, and houses are "made," but that,
> strictly speaking, children are not made, nor was
> the world made, at least in the standard sense as
> tables and chairs are, or even as fortunes or
> impressions.[21]

He goes on to point out that while it is possible for both
questions and statements to contain category mistakes,
questions contain certain interrogative words that further
restrict the possible combination of expressions in a
question. Thus, a question containing 'where' rules out

[21]Ibid.

time for example. Other w/h words (who, what, how, etc.)
function in the same way.[22]

Another kind of defective question, then, is the
group that contains category mistakes, and teachers should
obviously strive to avoid asking them.

Presuppositions

After discussing how to evaluate questions on the
basis of syntactic combinability, Bandman turns to a consid-
eration of the ways that questions may be evaluated on the
basis of their assumptions or presuppositions. Robert H.
Ennis explains the notion of a 'presupposition' in the
following way:

> Presuppositions are sentences which must be
> true for a given statement even to make sense.
> The claim, "The governor's mistakes have caused
> our present plight," presupposes that the governor
> has made mistakes. His not having done so would
> make nonsense out of either the affirmation or
> denial of the claim. If the governor has made no
> mistakes, it does not even make sense to say that
> his mistakes have caused our plight; nor does it
> make sense to say that his mistakes have not
> caused our plight.[23]

If it can be determined that the presuppositions upon
which a question rests are false, then it follows that the
question is defective. Bandman distinguishes two sub-
categories of these kinds of questions--complex or loaded

---

[22]Ibid.

[23]Robert H. Ennis, "Readiness to Master a Principle,"
in Psychological Concepts in Education, eds. B. Paul Komisar
and C. J. B. Macmillan (Chicago: Rand McNally and Company,
1967), p. 136.

questions and questions containing a false disjunction. The

following two sub-sections will examine these two sub-cate-

gories, while the third sub-section will be devoted to yet

another kind of question that is defective because of its

presuppositions. This third sub-category concerns question-

begging questions and is not mentioned in Bandman's article.

Complex or Loaded Questions

Some questions that are constructed in such a way as

to seemingly require a straightforward yes or no answer pre-

suppose that a prior question has already been answered

affirmatively. If it can be demonstrated that the prior

question would not be answered affirmatively, then it can be

concluded that the original question is a bad question. For

example, the following question:

42.) Do you still cheat on examinations?

presupposes that a prior question, namely:

43.) Did you ever cheat on examinations?

has been answered affirmatively. Thus, (42) is actually a

complex or loaded question because it is really two questions--

"Did you ever cheat on examinations?" and "If so, do you still

cheat?" Notice that even if the person being questioned

answers "no" to (42), he is tacitly answering "yes" to (43).

Thus, in order to avoid this dilemma he must point out that

the original question is defective because it rests on the

false presupposition that he used to cheat on examinations.

Bandman takes George S. Counts to task for asking the

following complex question:

44.)   Dare the school build a new social order?

Clearly, (44) presupposes that:

45.)   Can the school build a new social order?

has been answered affirmatively. If it can be demonstrated
that the answer to (45) is "no"--and there seems to be some
evidence to that effect[24]--then it is senseless to even ask
(44). Similarly, Bandman rebukes Brameld for asking:

46.)   Should Reconstructionism take over control
        of education?

by pointing out that it rests on the very dubious assumption
that Reconstructionism can take over control of education.[25]

Thus, in the interest of clear thinking, whenever a
complex question is encountered it should be rephrased so as
to expose its presuppositions. Moreover, asking complex
questions without recognizing them as such may result in
needless controversy over questions that should never arise
(e.g., 44 and 46).

False Disjunctions

Bandman also distinguishes a second kind of question
that may be defective because of its presuppositions, the
either/or question. This kind of question may result in the
fallacy of false disjunction or simplism, which occurs when

---

[24]See, for example, Louis Emmerig, Can the School
Build a New Social Order? (Amsterdam: Elsevier Scientific
Publishing Company, 1974).

[25]Bandman, "Educational Question," pp. 130-131.

all the alternatives of an either/or question are presumed to
be mutually exclusive or exhaustive when in fact they are not.

For example, the following two sentences:

47.) Either you will pass this course, or you
won't pass this course.

48.) Either you will pass this course, or you
will fail it.

have the same either/or grammatical form, but they have a
different logical form. That is, (47) exhausts all the
possible alternatives, while (48) does not since it overlooks
the possibility of droping or getting an incomplete and is
therefore a false disjunction. Similarly, the following two
sentences:

49.) Either you will pass this course, or you
will not pass this course.

50.) Either you will pass this course, or you
will go to summer school.

both exhibit the either/or form, but again they are logically
different. In sentence (49) the alternatives are mutually
exclusive. The alternatives in (50), on the other hand, are
not mutually exclusive, since it is possible to pass the
course in question and yet still go to summer school because,
for example, a different course was failed. When the
alternatives of an either/or question overlap as in (50),
then it is a false disjunction.

As an illustration of this problem, Bandman uses a
question asked by Harold Rugg in The Teachers of Teachers:

51.) Should teachers be leaders or followers?

which presents a forced option between leaders and followers.
Bandman notes that Myron Lieberman has recently re-expressed
Rugg's question to ask whether teachers are "professionals"
or "hired hands." According to Lieberman, we do not stand
over the doctor's shoulder and tell him how to operate, but
we may be very specific in our instructions to servants. In
effect, Lieberman asks, "Are teachers policy makers or hired
hands?" and "Who should decide educational policies, the
teaching profession or the lay public?" Bandman points out
that the alternatives do not exhaust all of the possible
disjuncts. Psychologists might, for example, best be able to
decide some educational questions. In other instances,
doctors, dieticians, policemen, sociologists, anthropologists,
economists, or philosophers might best be able to decide the
functions of education.[26]

Thus, for Rugg and Lieberman to ask whether teachers
are followers or leaders, policy makers or hired hands, is
to ignore the complexity of the problem. The presence of
false disjunctions in their questions makes them bad ques-
tions, and it is futile to attempt to answer them in their
original forms. In fairness to Rugg and Lieberman, if they
intended to ask:

> 52.) How can teachers assume more control of
>   teaching?

then the false disjunction is avoided. However, (52) is

---

[26]Ibid., p. 132.

a very different question from (51), and the questions of educators--and anyone else--should be evaluated on how they were actually formulated, not on how they are intended, since intent is a very difficult thing to judge.

It is important, then, when evaluating either/or questions to determine if it is logically possible for the alternatives to overlap or leave out other alternatives. These questions, containing false disjunctions, can be very misleading, as shown above, and thus should be avoided. So, a second category of questions that are defective because of false presuppositions is questions containing false dis-junctions.

Question-Begging

Another category of questions that are defective due to false presuppositions, and one that is overlooked by Bandman, consists of question-begging questions. These questions contain certain terms or expressions which assume or presuppose a particular answer to the question being asked. Consider the following question:

> 53.) If nature is well-ordered, must there not be a God?

The first phrase, by assuming that nature is well-ordered, results in a question that assumes what it actually asks. That is, the first phrase should be proven and not just assumed; but unless the assumption is brought out one is forced to answer "yes" to (53).

Sometimes, especially when dealing with an emotional, value-laden topic, teachers will ask question-begging questions by using mixed words as if they were purely descriptive. In order to explain this problem it is necessary to distinguish three general uses of words. A word is descriptive if it is used solely to describe--as 'big', 'far', 'green', etc. are usually used. A word is evaluative if it is used solely to give or deny value--as 'good', 'bad', etc. are usually used. A word is mixed if it both describes and evaluates. Moreover, it is possible for two words to have the same descriptive meaning but different evaluative meanings. Consider the following two sentences:

     54.)   Ohio State is run by its administrators.

     55.)   Ohio State is run by its bureaucrats.

It is clear that (55) is more derogatory than (54). Even though both 'bureaucrat' and 'administrator' describe essentially the same job, 'bureaucrat' has a more negative evaluative meaning than 'administrator'.

     Thus, when a teacher asks:

     56.)   What do you think of the Kent State slaughter?

or:

     57.)   Why should the immoral practice of giving
            abortions not be legalized?

he begs the question. The use of the mixed words 'slaughter' and 'immoral' presuppose a value assumption which must first be justified.

     The above kind of use of mixed words results in

slanted or biased questions. In order to avoid this problem,

teachers should recognize mixed words as such and attempt to

use descriptive terms as much as possible when asking value

questions, thus avoiding the fallacy of begging the question.

Answerability

It should be noted at the outset of this section that

'answerability' is an ambiguous term. Questions may be

'unanswerable' in at least four different ways. First, a

student may be physically unable to answer a question--he

might be physically incapacitated. Second, a student may be

cognitively incapacitated--he might simply lack the background

knowledge necessary to answer the question. Third, a student

may be psychologically unable to answer a question, even

though he may be physically and cognitively able, because,

for example, he is just too shy and timid to respond. These

three senses of 'answerability' are not the subject of this

section. A fourth way that 'answerability' is used is in

connection with metaphysical statements and questions. These

kinds of statements are described in the following way by

D. J. O'cconor:

> A statement is metaphysical if it assumes the
> existence of entities or facts which lie outside
> the range of human observation and experience.
> ... Note that statements are not metaphysical
> because they cannot in fact be checked by
> observation, but because they cannot in principle
> be checked in this way. Compare the following
> statements: (1) On January 1st, 1567, there were
> 6537 crocodiles in the River Zambesi. (2) Some
> good actions are the result of divine grace.
> (3) Julius Caesar had blood belonging to group AB.

> (4) Julius Caesar had an immortal soul. (2)
> and (4) are metaphysical; (1) and (3) are not,
> because, although we do not know whether they
> are true and can never find out, the sort of
> evidence which would confirm them is within the
> range of human observation.[27]

Sometimes, metaphysical questions are referred to as 'unanswerable'. It is this sense of 'answerability' that is employed throughout this section.

There is a position held by several philosophers,[28] which contends that there are no questions without answers; that if a question cannot be answered then it is a pseudo question. This criterion for evaluating questions, sometimes referred to as the Principle of Answerability is the subject of this section.[29]

Not only do several philosophers hold that the Principle of Answerability is correct, but in addition at least one noted philosopher of education, D. J. O'Connor, supports it:

> ... for a question to be a genuine one, it
> must have a framework that will determine in

---

[27]D. J. O'Connor, An Introduction to the Philosophy of Education (London: Routledge and Kegan Paul, 1968), p. 17.

[28]See, for example, R. Bambrough, "Unanswerable Questions," Proceedings of the Aristotelian Society, Supplementary Volume, 1966; M. Munitz, The Mystery of Existence (New York: Appleton Century Crofts, 1965); S. Toulmin, The Place of Reason in Ethics (Cambridge, Mass.: The University Press, 1950).

[29]It should be mentioned here that the Answerability Principle was often put forth as a part of the Verification Principle of meaning which holds roughly that if a statement is not in principle verifiable then it is meaningless.

advance the form that the answer must take and the
terms in which it will be made. We have such a
framework for a question when we know the sort
of evidence that will give us the answer but are
ignorant of exactly what the evidence will be.

For this reason it is often said of questions,
both scientific and philosophical, that a question
well put is already half answered or that the
secret of success lies in asking the right
questions. Now asking the right questions means,
among other things, putting questions that specify
implicitly the type of evidence appropriate to
their solution.

A meaningful question cannot be quite neutral
as to the answer it invites.[30]

Moreover, the answerability principle also has its

followers among educators, as can be clearly seen in the

following passage from an article published in the Journal of

General Education:

Put in more familiar terms, this means that
an answerable question is one that implies the
observations, or reliably reported observations,
needed to answer it. Any question that does not
meet this test--any question, that is, for which
no specifications are supplied as to the particular
observational procedures to be used in answering
it--is to be classified as meaningless for purposes
of fruitful inquiry, as nonsense from an investiga-
tive point of view. From a psychiatric point of
view it may be richly meaningful, of course. That
is to say that anyone who can analyze and interpret
such a question in a way that clarifies the confusion
of the one who asks it qualifies, to this extent,
as a psychiatrist. Anyone who unhesitatingly
answers the question, without recognizing its
meaningless character, qualifies as surely as a
fool.[31]

Before responding to the adherents of the answera-

bility principle, the basic tenet of the principle:

[30]O'Connor, Philosophy of Education, pp. 31-32.

[31]Johnson, "How to Ask a Question," p. 207.

58.)   There are no questions without answers.
must be examined closer. The first point that needs to be
made is that (58) contains two ambiguous terms, 'questions'
and 'answers'. In chapter two it was noted that the term
'question' was sometimes applied to sentences with an inter-
rogative form (verb, subject, object) regardless of their
function, and sometimes applied only to sentences with both
an interrogative form and an interrogative function (request-
ing information). Clearly, if 'question' is interpreted in
the former sense--as it often is--then the answerability
principle is false, since sentences like:

59.)   O death, Where is thy sting?
qualify as questions but only serve to express an emotion
and thus have no answers.

So, if the answerability principle is to be saved it
must be rephrased into something like:

60.)   There are no sentences with an interrogative
        function without an answer.
Even (60), however, falls prey to many counter-examples due
to the ambiguity of the term 'answer'.

Bandman points out that the word 'answer' can be
used in two different ways. First, 'answer' can be used in
a success sense as synonymous with 'solution'. Thus, for
example, in this success sense "George Washington" answers
the question ,"Who was the first President of the United
States?" Empirical and analytic questions require answers in
this success sense. However, there is a second way that

'answer' is used--namely, in the sense of a reply, response, or try. This task sense differs from the success sense in that it allows logically incompatible answers to the same question.[32] Thus, to the value question:

61.) What and how should we teach?
one educator gives his answer (reply) and a second gives a different answer (reply). Similarly, different philosophers give different answers (task sense) to metaphysical questions like:

62.) What is the ultimate nature of reality?

The problem is, how is the answerability principle to be interpreted? Clearly, the intent of the principle is to allow sentences like (61) to count as meaningful questions, but deny that sentences like (62) are meaningful questions. But on what grounds can this distinction be made? Metaphysical questions do have answers in the task sense, so 'answers' in (60) must be interpreted in the success sense if (60) is to make sense. Admittedly, metaphysical questions have no answers in the success sense, but neither do a whole host of value questions (including 61). It appears, then, that the Principle of Answerability leaves much to be desired since it fails to distinguish between metaphysical and value questions, and thus cannot be used as a criterion to evaluate questions.

On the other hand, Bandman points out that his task/

---

[32]Bandman, "Educational Question," pp. 135-137.

success distinction is often overlooked resulting in the use
of questions that require task answers as if they had success
answers. This is often the way that dogmatism creeps into
philosophy of education (witness the fiery disputes between
empiricists and existentialists, pragmatists and idealists,
etc.). Thus, Bandman suggests that any question that is
misused in this way is logically defective.[33] So, while
answerability fails as a usable criterion for judging
questions, "use" does seem to qualify as a viable criterion.

What, then, of the status of metaphysical questions?
Metaphysical questions are those like (62) about whose meaning
and method of answering there is no general agreement, or
which seem to have no meaning or method of answering. This
does not imply that they can be classified as meaningless or
nonsensical because it is always possible that their meaning
and method of answering will be agreed upon in the future.
Adapting a metaphor used by John Wilson in describing the
status of metaphysical statements, to call a question
metaphysical is like putting a letter in the "pending" tray;
it means that it is not yet agreed what it means or how to
answer it, and that, therefore, judgment must be reserved
about whether or not it is a meaningful question.[34]

---

[33]Ibid., pp. 133-139.

[34]John Wilson, Language and the Pursuit of Truth
(Cambridge, England: The University Press, 1969), p. 70.

Conclusion

In the opening paragraph of this chapter it was noted that it has long been known that some questions are good questions while others are bad questions. In addition, it was observed in the introduction of this chapter that questions can be evaluated two different ways, strategically or logically. While it is important for questions to be good both strategically and logically, this chapter has concentrated on searching for the logical characteristics of good questions. A basic assumption of this chapter is that if a question contains no logical flaws then it is more likely to allow students to acquire knowledge. Also, it is important to realize the generality of the subject matter of this chapter. Classroom communications can benefit from improving the logical quality of questions asked by both teachers, regardless of their subject, grade level, etc., and students. Thus, this chapter has a very broad pedagogical application.

Chapter Summary

The first characteristic to be examined was clarity, and it was decided that this was indeed an important characteristic of good questions, but that the notion of 'clarity' was itself too vague to be very useful as advice to the practicing teacher. Accordingly, in an attempt to be more specific, ambiguity and vagueness were examined. Three types of ambiguity were distinguished--functional, semantic, and syntactic--and all three were judged to be characteristics

to avoid in constructing question. Vagueness was divided into two kinds--semantic and syntactic--and it was concluded that the presence of either kind of vagueness need not necessarily render a question defective. Vague questions are problematic only when they are not recognized as such and used as if they were precise. Next, a criterion proposed by Bandman, syntactic combinability, was broken down into two sub-categories--nonsense syllable questions and questions containing category mistakes. It was determined that questions falling into either of these two sub-categories were defective and should be avoided. Another Bandman criterion, presuppositions, was also divided into two sub-categories--complex questions and questions containing false disjunctions. In addition, a third sub-category of this same criterion--question-begging questions--which was over-looked by Bandman was introduced. Again, questions falling into any of these sub-categories were deemed defective. Finally, answerability was examined and found lacking as a criterion for evaluating questions. It was determined, how-ever, that Bandman's task/success distinction provided a viable criterion by which to judge whether certain kinds of questions were being misused. Moreover, it was also argued in this section that all metaphysical questions should not be categorized as meaningless, but rather that judgments about their meaningfulness should be reserved.

Recommendations for Future Research

No claims have been made about the comprehensiveness of the list of characteristics by which to judge questions compiled in this chapter. This list should in no way be considered complete or exhaustive, rather it should be viewed as an incomplete checklist to consult when evaluating the logical characteristics of questions. Undoubtedly, much more conceptual work remains to be done in this area in an attempt to lengthen the checklist. In addition, an instrument to record the various logical flaws of actual classroom questions needs to be developed in order to more efficiently evaluate and thus improve the questions of both students and teachers. Furthermore, much empirical research is required in order to test the validity and reliability of such an instrument, and to test the importance and effectiveness of instruction in and modification of questioning techniques in the classroom with regards to the logical characteristics of questions.

Chapter 4

THE LOGIC OF CLASSROOM QUESTION CLASSIFICATION SYSTEMS

In chapter one it was noted that teachers commonly devote a large portion of the school day to question-centered discussions. Estimates are that from two-thirds to four-fifths of the typical school day is taken up with questioning activities. Indeed, recent research indicates that some elementary school teachers average nearly three and one-half questions per minute.[1]

As with other teaching activities, it is the quality, not the quantity, of the questioning that should receive emphasis. To use questions effectively as a teaching device, well-developed techniques are needed; yet few teachers have experienced instruction in questioning. Most teachers have developed their question-asking techniques through a series of trial-and-error experiences in the classroom. The subject of this chapter, classroom question classification systems, is one area that can be employed in a teacher training

---

[1]See William Floyd, "An Analysis of the Oral Questioning Activity in Selected Colorado Primary Classrooms" (Ph.D. dissertation, Colorado State College, 1960), p. 139; and Joan E. Schreiber, "Teachers' Question-Asking Techniques in Social Studies" (Ph.D. dissertation, The University of Iowa, 1967), p. 74.

program to improve teachers' questioning skills. The subject

of the previous chapter, the logical characteristics of

classroom questions, is another area that can and should be

used in a similar manner.

Introduction

Many educational researchers have attempted to

describe the types of classroom questions asked by teachers.

In order to quantify this research there has been an empha-

sis on the development of categories into which teachers'

questions can be classified. At least twenty-one classifi-

cation systems for classroom questions have been devised in

recent years.[2]

---

[2] See T. H. Adams, "The Development of a Method for
Analysis of Questions Asked by Teachers in Classroom Dis-
cussion" (Ph.D. dissertation, Rutgers University, 1964);
M. J. Aschner, "Asking Questions to Trigger Thinking," NEA
Journal 50 (1961): 44-46; Benjamin S. Bloom, ed., Taxonomy of
Educational Objectives: Handbook I: Cognitive Domain (New
York: David McKay, 1956); R. L. Carner, "Levels of Question-
ing," Education 83 (1963): 546-550; R. D. Clements, "Art
Student-teacher Questioning," Studies in Art Education 6
(1964): 14-19; H. M. Clements, William R. Fielder, and
B. R. Tabachnick, Social Study: Inquiry in Elementary Class-
rooms (New York: Bobbs-Merrill Company, Inc., 1966);
Claudia Crump, "Self-Instruction in the Art of Questioning in
Intermediate-Grade Social Studies" (Ph.D. dissertation,
Indiana University, 1969): Malcolm P. Douglass, Social Studies:
From Theory to Practice in Elementary Education (New York:
Holt, Rinehart, and Winston, Inc., 1966); R. Enokson,
"Simplified Teacher Question Classification Model," Education
94 (1973): 27; Jack R. Fraenkel, "Ask the Right Questions!,"
Clearing House 41 (December, 1966): 199-202; James J.
Gallagher, "Research on Enhancing Productive Thinking,"
Nurturing Individual Potential (Washington, D.C.: Association
for Supervision and Curriculum Development, 1964), pp. 52-53,
and "Expressive Thought by Gifted Children in the Classroom,"
Elementary English 42 (1965): 559-568; James J. Gallagher,

⌐Most of these systems consist of a limited number of
general categories which can be used to classify questions
irrespective of such factors as subject-matter area, grade
level, etc. Some systems, however, have been developed with
a specific curriculum in mind⌐ For example, Guszak's system
was designed to classify questions that teachers ask elemen-
tary school reading groups, and Schreiber's system for clas-
sifying social science questions includes a category called
"Use of Globes" (e.g., Will you find Greenland on the globe?).
These curriculum-specific systems have their advantages (e.g.,
their categories can perhaps be more precise), but they are
not the subject of this chapter. Instead, in order to
increase its scope, the focus of this chapter is on cross-
subject question classification systems. The assumption that
classroom questions in general can be categorized, and that
these kinds of systems can be pedagogically fruitful to all

---

and Mary Jane Aschner, "A Preliminary Report on Analysis of
Classroom Interaction," Merril-Palmer Quarterly 9 (1963):
183-194; J. P. Guilford, "The Structure of the Intellect,"
Psychological Bulletin 53 (July, 1956): 267-293; F. J.
Guszak, "Teacher Questioning and Reading," The Reading Teacher
21 (1967): 227-234; Frances Minor, "In Resonance with
Students," Educational Leadership 23 (April, 1966): 537-540;
J. R. Moyer, "An Exploratory Study of Questioning in the
Instructional Processes in Selected Elementary Schools (Ph.D.
dissertation, Columbia University, 1966); R. T. Pate, and
N. H. Bremer, "Guiding Learning through Skillful Questioning,"
Elementary School Journal 67 (1967): 417-422; Norris M.
Sanders, Classroom Questions: What Kinds? (New York: Harper
and Row, 1966); Joan E. Schreiber, "Teachers' Question-Asking
Techniques in Social Studies" (Ph.D. dissertation, University
of Iowa, 1967); B. Othanel Smith, and Milton O. Meux, A
Study of the Logic of Teaching (Urbana, Illinois: University
of Illinois Press, 1960).

teachers irrespective of subject-matter area, grade level,

etc. will be justified later in the chapter.

In the next section of this chapter the most popular

classroom question classification system, devised by B. S.

Bloom, is examined with an eye to its pedagogical significance

and its logical and methodological flaws. The third section

is devoted to a different kind of question classification

system, devised by B. O. Smith and M. O. Meux, which has been

largely ignored by educators, but promises to have just as

much pedagogical importance as Bloom's system. In the fourth

section a statement classification system constructed by

John Wilson is adapted to yet another question classification

system in order to lay some conceptual groundwork for the

fifth section. An alternative classroom question classifi-

cation system is outlined in that section. Finally, the

sixth section contains a chapter summary and some recommen-

dations for future research.

Bloom's Question Classification System

Probably the most representative and by far the most

popular question classification system is the one developed

by Benjamin S. Bloom in Taxonomy of Educational Objectives.

In a review of the literature on the use of questions in

teaching, Meredith Gall concluded that "...Bloom's Taxonomy

best represents the commonalities that exist among (classroom

question classification) system."[3]

A Description

The heart of Bloom's book is the definition of six
kinds of thinking which he labels knowledge, comprehension,
application, analysis, synthesis, and evaluation. These are
outlined below:

I.   Knowledge: At the knowledge level the
     student is asked to perform simple recall.
     1. In the electoral college, what determines
         the number of electors from each state?

II. Comprehension: The student is asked to put
     information in another form
     1. Contrast the electoral college system
         with a direct democracy.

III. Application: The student is asked to select
     facts, principles, and/or generalizations and
     apply these to a particular problem.
     1. How would it be possible for a candidate
         to receive a majority of the popular vote
         and still not be elected President?
         (Assuming students have not previously
         read about how a minority candidate could
         be elected.)

IV. Analysis: Students identify and comprehend
     the elements or parts of a process,
     communication, or series of events.
     1. Which step in the process of electing
         a President would you think the
         American people know least about?

V.   Synthesis: The students are encouraged to
     engage in original thinking.
     1. Draft a Constitutional amendment which
         would preserve the electoral college
         system but which would prevent the
         election of a President who did not
         receive the largest number of popular
         votes.

---

[3]Meredith Gall, "The Use of Questions in Teaching,"
Review of Educational Research 40: 707-721.

VI.   Evaluation: 'Students are asked to determine
      how closely a concept or idea is consistent
      with standards or values.
      1.   After examining criticisms of the
           electoral college and proposals for
           change, which proposed change do you
           think would be the most democratic?

According to Bloom, specified types of questions
lead to each kind of thinking. So, a teacher who masters the
six categories can classify the questions he asks in recita-
tion, homework, and evaluation to determine whether students
are receiving an adequate variety in thinking experiences.
The purpose of the taxonomy is to provide a framework with
which to measure the variety of teachers' questions, and to
suggest what should be done to broaden them. A science
teacher, for example, who discovers that he offers few or no
questions calling for creative thinking (synthesis) or eval-
uative thinking can study the nature of the questions in
these categories and build them into his lessons. Moreover,
Bloom's major contention is that in the typical classroom
students are seldom required to go beyond the level of
application questions, and that most questions are at the
knowledge and comprehension levels.

A few teachers find that they are naturally good
questioners, but a large body of research indicates that the
majority of teachers offer a relatively narrow range of
questions. As far back as 1912, Stevens found that major
emphasis was placed on memory questions in English and social
studies classes.[7] She called for a more intelligent use of

questions as instructional devices, urging that questions should stimulate reflective thinking in addition to the mere memorization and recital of factual data.[4] Unfortunately, despite this study, for many years little heed was paid to Stevens' call for careful study of the use of classroom questions.

After 1955, however, a large number of studies appeared that strongly reinforced Stevens' early findings. Using a classification system based upon Guilford's model of thinking processes,[5] Gallagher found that most teachers' questions were at the "cognitive-memory" level.[6] Davis and Tinsley reached similar conclusions using Bloom's Taxonomy as a model. They reported that teachers asked more memory questions than all other kinds of questions combined.[7] Stevens' findings were also substantiated by Guszak, who found that recall questions were asked more than half the time (57 percent) by teachers in grades two, four, and six.[8]

---

[4]Romiett Stevens, "The Question as a Measure of Efficiency in Instruction: A Critical Study of Classroom Practice," Teachers College Contribution to Education, no. 48 (1912).

[5]Guilford, "The Structure of the Intellect."

[6]Gallagher, "Expressive Thought."

[7]O. L. Davis and Drew C. Tinsley, "Cognitive Objectives Revealed by Classroom Questions Asked by Social Studies Student Teachers," Peabody Journal of Education 45 (1967): 21-26.

[8]Frank J. Guszak, "Questioning Strategies of Elementary Teachers in RElation to Comprehension," paper presented at the International Reading Association Conference, Boston, Mass., 24 April 1968.

It is apparent that the same problem prevails in the written questions found in textbooks and teacher-made tests. Cunningham pointed out that in the science texts and the laboratory manuals then in use (1925), there was an over-abundance of questions requiring simple recall and memorization of data.[9] Similar evidence was found by Davis and Hunkins, who examined elementary social studies textbook questions using Bloom's Taxonomy as a model. They found an overwhelming emphasis upon knowledge of specific facts.[10] Using the same approach, Pfeiffer and Davis discovered the same emphasis in teacher-made tests.[11]

The conclusion is inescapable--Bloom's contention is clearly valid. The type of question that teachers most often ask is at the lowest cognitive level, requiring only the recall of a memorized answer. The frequently voiced suggestion that teachers ask high-level thought questions has apparently fallen on deaf ears.

Recognizing this fact, other researchers have investigated the effects of training teachers in the use of Bloom's taxonomy on the level of classroom questions.

---

[9]Harry A. Cunningham, "Types of Thought Questions in General Science Textbooks and Laboratory Manuals," General Science Quarterly 9 (1925): 91-95.

[10]O. L. Davis and Francis P. Hunkins, "Textbook Questions: What Thinking Processes Do They Foster?" Peabody Journal of Education 43: 285-298.

[11]Isobel Pfeiffer and O. L. Davis, "Teacher-made Examinations: What Kind of Thinking Do They Demand?" The NASSP Bulletin 49 (1965): 1-10.

Studies by Clegg and his associates,[12] and by Farley and Clegg,[13] found that when teachers were given such training they significantly increased their use of higher-level questions in the classroom. In addition, experienced teachers given such training demonstrated high degrees of reliability and validity in analyzing tapes of classroom dialogues made by student teachers. These findings indicate the value of the taxonomy when used with an observational instrument as a feedback device for the improvement of instruction. Using a different approach, Hunkins developed instructional materials in which almost half of the questions were at higher cognitive levels. He found that students trained with such materials scored significantly higher on a test of social studies achievement than comparable students whose instructional materials were almost entirely at the memory level.[14]

The importance of questions and questioning techniques, and the ability to modify teachers' questioning

---

[12]Ambrose A. Clegg, Jr., George T. Farley, and Robert J. Curran, "Training Teachers to Analyze the Cognitive Level of Classroom Questioning," Research Report no. 1, Applied Research Training Program, Boston, University of Massachusetts, 1967.

[13]George T. Farley and Ambrose A. Clegg, Jr., "Increasing the Cognitive Level of Classroom Questions in Social Studies: An Application of Bloom's Taxonomy," paper presented as part of the symposium "Research in Social Studies Education" at the American Educational Research Association Annual Convention, Los Angeles, 8 February 1969.

[14]Francis P. Hunkins, "The Influence of Analysis and Evaluation Questions on Achievement in Sixth Grade Social Studies," Educational Leadership 25 (1968): 326-332.

behavior through the use of classroom question classification systems like Bloom's, thus seems well-established.

An Analysis

In her review of the literature on the use of questions in teaching Gall outlines two shortcomes of Bloom's system. First, it is composed of categories based on the type of cognitive process required to answer the question. For example, the question "What is your opinion of our present stance on the Vietnam War?" is classified as an Evaluation question because it requires evaluative thinking, whereas "What assumptions does the author make in critizing New Deal politics?" is classified as an Analysis question because it requires that students engage in anlytic thinking. A weakness of this cognitive-process approach to question classification is that these processes cannot be observed directly. Thus, the question, "What are some similarities between the ancient Greek and the American forms of democracy?" probably stimulates critical thinking in some students, but it may only elicit rote recall if students answer by recalling similarities they have read in a textbook. Second, it seems evident that Bloom's system classifies questions which cover only a few important educational objectives--namely, the types of questions which teachers ask to test students' recall of information and to develop their critical thinking processes. Yet there are several other worthwhile question types: 1.) questions which cue students to improve on an

initially weak response to a question (e.g., Can you tell me a little more? What do you mean by that? etc.), 2.) questions which create a discussion atmosphere (e.g., Billy, do you agree with Sue's position? etc.), 3.) questions which stimulate students' sense of curiosity and inquiry (e.g., What would you like to know about this manuscript? How would you propose to find an answer to this question? etc.), 4.) questions which guide students' learning of a problem-solving, behavioral, or affective skill (e.g., What do you think we do next to solve this problem? Mark, what is your response to these drawings? etc.).[15]

A third criticism of Bloom's system concerns the fact that the category headings and definitions are rather vague and abstract. In a recent article on questions, Ladas and Osti suggest that if teachers are to use Bloom's taxonomy effectively in the classroom it seems certain that the headings must be translated into a form that is more lucid and of immediate use. Unfortunately, their advice is limited to noting that four of the six taxonomical headings can be changed and used as the key word in a teacher's question--application, analysis, synthesis, and evaluation, become apply, analyze, synthesize, and evaluate. Since comprehension is not translatable, they suggest that instead of "What do you comprehand by the term 'nationalism'?" which is awkward to say the least, the teacher might say "In your

---

[15]Gall, "The Use of Questions."

own words, what does the term 'nationalism' mean?" Similarly, knowledge is translated into two forms depending on the teacher's objectives. If the teacher intends to elicit specific data that the students have already learned, then his question will contain who, what, where, when, why, or how. On the other hand, if the teacher wishes to have the students respond with general information about a given subject, rather than specific data, then knowledge can be translated to know. For example, if a teacher wishes to teach the essay as a literary type or genre, he might begin the lesson by asking "What do you know about the essay?" or "Do you know what the essay and the short story have in common?" or "Do you know what makes the essay different from the short story?"[16]

Obviously, these translations are by no means fixed or exhaustive. There are a large number of verbs that may be used in formulating questions, but Ladas and Osti are on the right track in trying to translate Bloom's headings into ordinary language.

Simply translating the category headings may not be enough, however. For example, the question "Analyze the ecological problem of dumping raw sewage into the Scioto River" might bring the student response "Pollution." Here the student gives no evidence of analyzing the problem. In

---

[16]Harold Ladas and Louis Osti, "Asking Questions: A Strategy for Teachers," The High School Journal 59 (January, 1973): 179.

a more thoughtful answer, however, he could have discussed

such specifics as oxygen reduction and temperature increase

and how they lead to the death of fish, etc. Thus, it is

important that the student understand what type of response

is expected. When the operation to be performed in response

to a question is not understood by the student, definitions

and examples of the operation are necessary to elicit the

desired response. This means, for questions like the one

above, defining and/or giving examples of what analysis is.

Bloom defines analysis this way:

> The breakdown of communication into its constituent
> elements or parts such that the relative hierarchy
> of ideas is made clear and/or the relations between
> the ideas expressed are made explicit. Such
> analyses are intended to clarify the communication,
> to indicate how the communication is organized, and
> the way in which it manages to convey its effects,
> as well as its basis and arrangement.[17]

Clearly, this definition is abstract to an extreme.

What seems to be needed is an English translation of Bloom's

definition. The upshot of this problem of abstractness is

that it is very difficult to apply Bloom's categories without

a great deal of training. So, while Bloom has correctly

drawn attention to the fact that memory questions are too

common in the classroom and that there are other kinds of

questions that teachers can ask, the application of his

classroom question classification system leaves much to be

desired. Thus, taking a hint from Ladas and Osti, a system

[17]Bloom, _Taxonomy_, p. 205

based on the different verbs that can be used in asking questions is the subject of the next section.

Smith and Meux's Question Classification System

While Bloom's system enjoys great popularity among educators, the following classroom question classification system devised by B. O. Smith and M. O. Meux has, unfortunately, been largely ignored even though it promises to have just as much if not more pedagogical importance in the long run.

↓A Description

    I.   Defining: Questions in this category ask for the meaning of a term, including the identification of a proper noun or the identification of a symbol.
        1. What does 'placid' mean?
        2. Who was Robinson Crusoe?
        3. What is the meaning of 'e.g.'?

    II. Describing: This category is very extensive because there are many different kinds of descriptions, but it does not include value judgments.
        1. What's happening in South Africa now?
        2. What can you tell us about the amoeba?
        3. What does the governor on a motor do?
        4. How would you describe the landing of a plane?

    III. Designating: These ask for examples or a classification. They do not ask for reasons or beliefs.
        1. What do we call this kind of political view?
        2. What are some other examples of alliteration?

    IV. Stating: These ask for rules, reasons, arguments, beliefs, conclusions, criticisms, and recommendations.
        1. What, then, are your conclusions about

the use of a wage/price freeze?

    2.   What criticisms did they make of Harding's administration?

V.   <u>Reporting</u>: These ask specifically for what the text or source states about something.

    1.   What does the author say about justice in his first paragraph?

    2.   How does Mark Twain describe Tom Sawyer?

VI.   <u>Substituting</u>: These ask or direct the student to substitute or simplify an expression.

    1.   Substitute for us in this equation.

    2.   Simplify it for us.

VII.   <u>Evaluating</u>: These ask for a judgment of good or bad, right or wrong, etc.

    1.   Do you think President Truman was right when he removed General MacArthur?

    2.   Is a law requiring a person to belong to a union bad?

VIII.   <u>Opining</u>: These ask for an opinion, but do not include value judgments.

    1.   Do you think that Napoleon would favor present French foreign policies?

    2.   Would an income tax benefit the poor?

    3.   Does a fish have to live in water?

    4.   What will the next generation say about the Nixon Administration?

IX.   <u>Classifying</u>: Generally an example is given and the student is asked to name its class.

    1.   What group of animals does the starfish belong to?

    2.   Is NaOH an organic or inorganic compound?

X.   <u>Comparing and Contrasting</u>: These ask about the relationship between two or more things.

    1.   Compare Ohio State with Michigan.

    2.   Contrast materialism with idealism.

XI.   <u>Conditional Inferring</u>: These ask a question in the form of a conditional.

    1.   If you had a car and go fifty miles an hour for three hours, how far would you go?

    2.   If you saw it from the back, what would it appear to be like?

XII.   Explaining: There are several different
        sub-categories depending on what kind of
        explanation is asked for.
        1. Mechanical: These ask how a biological
            process occurs or is performed.
            a. How does a chicken digest its food.
        2. Causal: These ask for a cause.
            a. Why does iron rust?
        3. Sequent: These ask for a chronology.
            a. How did Nixon happen to become
                President?
        4. Procedural: These ask how something
            is done.
            a. How did you get the answer to that
                problem?
            b. How is sulphur mined?
        5. Teleological: These ask for the purpose
            or function.
            a. Why did Agnew resign?
            b. Why is lead pipe used in plumbing?
        6. Normative: These ask for a justification.
            a. How do you know that sodium
                chloride will react neutral?

XIII.   Directing and Managing Classroom: These are
        designed to keep the classroom activities
        moving along.
        1. Who has problem number 4?
        2. Who is to lead the group today?
        3. Who wants to give a report on the
            Fisheries?

It is quite apparent that Smith and Meux's system is

a different kind of system than Bloom's. While the latter

is composed of categories which are based on the type of

cognitive process required to answer the question (i.e.,

recall, comprehend, apply, analyze, synthesize, evaluate),

the former is composed of categories that are based on the

type of "logical operation" being requested in the question

(e.g., define, describe, explain, etc.).

On the other hand, it is possible to use both kinds

of systems at the same time, or modify one or both systems

to form one comprehensive system. In fact, Ladd and Anderson

used a modification of Smith and Meux's system to identify

twenty "low inquiry" teachers and twenty "high inquiry"

teachers of a ninth-grade earth science course--the defini-

tions of low and high inquiry corresponded roughly to lower

and higher level questions in Bloom's system. Furthermore,

tests made up of high and low level questions were given to

students of the forty teachers, and students of high inquiry

teachers showed markedly better scores on both kinds of

tests.[18] Thus, this study using an adaptation of Smith and

Meux's system seems to corroborate Hunkins' findings[19]

using Bloom's system.

An Analysis

The pedagogical purpose of Bloom's system is clear

enough--to increase the variety and upgrade the level of

teachers' questions in order to increase students' under-

standing--but what is to be gained by using Smith and Meux's

system? First, Smith and Meux's system avoids some of the

criticisms leveled at Bloom's system. Gall's second criti-

cism of Bloom's system--the fact that it omits some important

kinds of classroom questions (e.g., What do you mean by that?

What is your response to this? Do you agree with that?

---

[18]George T. Ladd and Hans Q. Anderson, "Determining
the Level of Inquiry of Teachers' Questions," Journal of
Research in Science Teaching 7: 395-400.

[19]Hunkins, "Analysis and Evaluation Questions."

What would you like to know about this?)-- is at least

partially answered by Smith and Meux with the inclusion of

those kinds of categories in their system (e.g., defining,

opining, directing and managing classroom, etc.).

Second, Gall's first criticism of Bloom's system--

that it was impossible to directly observe cognitive pro-

cesses and thus difficult to determine which category some

questions belong in--does not seem applicable to Smith and

Meux's system since questions are categorized in their

system accoridng to cues within the questions (i.e., the

logical operation requested) and not the cognitive processes

required to answer them.

The benefits of Smith and Meux's system are not

limited to avoiding some of the criticisms of Bloom's system,

however. Its pedagogical importance lies in the fact that it

illustrates the many different kinds of logical operations

that might be required to answer a question (e.g., definitions,

descriptions, evaluations, etc.). Thus, Smith and Meux's

system could be used to improve teachers' questioning tech-

niques by making them aware of, and thus getting them to

avoid, questions that are semantically ambiguous. For example,

if one of the questions on an American history exam is

"Explain the Civil War," it would be possible to respond

with a description, evaluation, report, causal explanation,

sequent explanation, teleological explanation, or even a

normative explanation. However, it is possible, using Smith

and Meux's system, to construct a more precise question (e.g.,
What was the purpose of the Civil War?) and thus avoid those
familiar and frustrating situations in which a student's
answer is correct, but not the one desired.

Moreover, a teacher familiar with this facet of
Smith and Meux's system would not only improve his own
questions, but would also be better equipped to handle
students' semantically ambiguous questions. For example, if
a second grader were to ask "Why do animals grow long hair in
the winter?" it is important to be able to recognize the
semantic ambiguity and determine if a causal explanation
(e.g., The drop in temperature causes the production of
certain enzymes which cause their hair to grow longer) or a
teleological explanation (e.g., In order to keep warm) is
desired.

Although Gall's first criticism of Bloom's system--
that cognitive processes cannot be directly observed--is not
directly applicable to Smith and Meux's system, its end
result, the blurring of categories, is. In fact, Smith and
Meux admit that "It has been possible to develop neither
completely independent categories nor suitable criteria by
which to eliminate such difficulties..."[20]

Using four graduate students as judges, the relia-
bility of their categories ranged from .33 to .88 with .67

---

[20]Smith and Meux, Logic of Teaching, p. 47.

being the median.[21]   It appears that the realiability could

be greatly improved with a reorganization of the categories,

however.   There seems to be no overall conceptual scheme in

Smith and Meux's system.   Thus, for example, there appears to

be an overlap between their describing and explaining cate-

gories: "What have you discovered about the way to extract

potassium?" is classified as a description, while "How do

you extract potassium?" is classified as a procedural expla-

nation.[22]

In addition, it seems that certain categories (e.g.,

conditional inferring) are based not on the logical operation

requested, but on the syntactical form of the question.   It

does not seem at all clear why conditional inferring is a

separate category instead of a sub-category, for example.

Indeed, Smith and Meux are not clear about what counts as a

"logical operation."   They define this crucial term in the

following way:

> By 'logical operations', which are the focus
> of our study, we mean the forms which verbal
> behavior takes as the teacher shapes the subject
> matter in the course of instruction.[23]

It appears that Smith and Meux have failed to

recognize the ambiguity in the phrase "forms of verbal

behavior" with the result that some of their categories have

---

[21]Ibid., p. 45.

[22]Ibid., pp. 215-225.

[23]Ibid., p. 3.

a semantic basis (e.g., describing), others a syntactic basis (e.g., conditional inferring) and still others a functional basis (e.g., directing and managing classroom). The utility of a classroom question classification system with a semantic basis has already been pointed out, but it is difficult to see how syntactical categories, such as conditional inferring, could be used to improve teachers' questioning techniques. This is not to deny that good syntax is important to asking good questions (as shown in chapter three of this study), but simply to question the usefulness of syntax as the basis for the categories of a classroom question classification system.

The idea of including a category like directing and managing classroom which is devoted to questions other than those requesting information is a good one. However, to be more consistent·this category should include all three kinds of rhetorical questions--those that have a declarative, imperative, or exclammatory function--and should be set off entirely from questions that have an interrogative function. Clearly, however, the main ingredient that Smith and Meux's system lacks is an overall conceptual framework to eliminate the overlap among categories and to make the system more comprehensive. In order to accomplish that task, yet another system must be introduced.

Wilson's Statement Classification System

Even with all the obvious pedagogical importance of Smith and Meux's system, the problems associated with it requires a complete overhauling. First, however, some groundwork must be laid in order to avoid some problems not yet discussed.

A Description

It does not seem too difficult to adapt John Wilson's statement classification system in Language and the Pursuit of Truth into a question classification system. In that book Wilson distinguishes five kinds of statements:

I. Imperatives and Attitude Statements: these are used to give commands or express attitudes, and are either not verifiable at all, or only in a trivial sense.
1. Shut the door.
2. I like ice cream.

II. Empirical: these give information about the world based on our experience of it, and are verifiable by tests conducted in terms of our experience, and ultimately in terms of our sense-experience.
1. All swans are white.

III. Analytic: these give information about the relationships between verbal, logical, or mathematical symbols, and are verified by the laws of language, logic, or mathematics.
1. All red objects are colored.

IV. Value: these are used to judge something or someone as good or bad on the basis of some criteria, and are verified partly on a knowledge of the facts and partly on the criteria of value.
1. This is a good knife.

V. Metaphysical: these are statements which seem to have no method of verification at all.

        1.   God will save the righteous.[24]

An Analysis

This system contains the general conceptual framework for classifying the vast majority of classroom questions. Furthermore, the fact that the general categories of this system can be pedagogically useful can be illustrated by the following anecdote. When Coolidge was President he was once asked why the unemployment rate was so high, and he responded by saying "Because there are a lot of people out of work." With the proper training in Wilson's system, it would be possible for a teacher or student to realize that the original question was intended to be a request for an empirical answer (e.g., because Congress has overspent, etc.), but Coolidge responded with an analytic answer (i.e., a definition of 'high unemployment rate').

The distinction between empirical and analytic questions thus seems to be an important one. The former is obviously a very broad category and includes questions about causes, purposes, functions, estimates, predictions, rankings or gradings, and many different kinds of descriptions. For example, empirical descriptions can be sub-divided into requests for properties or characteristics, examples, classification, labels or names, summaries, reviews, procedures or processes, chronological sequences, relationships, compari-

---

[24]John Wilson, Language and the Pursuit of Truth (Cambridge, England: The University Press, 1969), pp. 56-74.

sons, or contrasts. Definitions and examples of the categories and sub-categories of empirical and analytic questions will be provided in the next section. The point to be recognized here is that the empirical/analytic distinction provides a conceptual framework with which to orderly classify a large number of questions.

One of the characteristics of Wilson's system lacking in Smith and Meux's system is the fifth category, metaphysical questions. Some paradigm examples of metaphysical questions are:

1.) Does God exist?

2.) Does everyone have a soul?

3.) Why is there something rather than nothing?

4.) When did time begin?

5.) If a tree falls in a forest with no one around, does it make a sound?

Since it is a fact that these kinds of questions do indeed get asked, any complete classroom question classification system needs to include a category devoted to them.[25]

Another new category introduced by Wilson is the one he labels attitude statements and which contains questions about attitudes or preferences (i.e., likes and dislikes). An example of this kind of question is:

4.) Do you like ice cream.

Smith and Meux indicate that this kind of question would be

---

[25]Refer to the section on answerability in chapter three of this study for a fuller explanation of metaphysical questions.

placed under their describing category, but do not cite any reasons why.[26] It is important, at least pedagogically, to establish a separate category for preference questions in order to draw attention to the difference between preference questions, whose answers do not require any justification, and value or normative questions, whose answers do require justification (i.e., grounds, reasons, criteria for making the normative judgment).

Still another improvement over Smith and Meux's system is Wilson's imperative category. Before going any further, however, it should be noted that a reorganization of this category will result in a conceptual breakthrough that will provide another link in the search for an overall framework with which to construct a comprehensive classroom question classification system.

In chapter two it was observed that any sentence form can have an interrogative function. Moreover, it was noted that sentences with an imperative form but an interrogative function (e.g., Explain the Civil War) can be classified as questions. In addition, sentences with an interrogative form but an imperative function (e.g., Will you read your book report, please?) can be classified as rhetorical questions. Furthermore, sentences with an interrogative form but declarative or exclammatory functions can also be classified as rhetorical questions.

---

[26]See Smith and Meux, *Logic of Teaching*, p. 214.

Thus, it is possible to divide all questions into two categories: 1.) interrogative questions (sentences with an interrogative function regardless of form), and 2.) rhetorical questions (sentences with an interrogative form but a declarative, imperative, or exclammatory function). The first category has five major sub-divisions--empirical, analytic, metaphysical, preference, and normative judgment-- while the second has three sub-divisions--imperative, declarative, and exclammatory.

An Alternative Classroom Question Classification System

Keeping all the aforementioned distinctions in mind, the following is offered as an alternative classroom question classification system.

A Description

I. <u>Interrogative Questions</u>: Sentences with an interrogative function, regardless of form (i.e., requests for information).

    A. <u>Empirical</u>: Questions about the world and our experiences of it.

        1. <u>Causal</u>: Questions about the cause of something.
            a. Why did the pond freeze?
            b. What caused World War I?

        2. <u>Teleological</u>: Questions about someone's purpose, aim, or goal.
            a. Why did Nixon refuse to turn over the Watergate tapes?
            b. Why did Nixon institute a wage/price freeze?

        3. <u>Functional</u>: Questions about something's function.
            a. Why does the liver secrete bile?
            b. What is the function of the pancreas?

4. <u>Non-normative Judgment</u>: Requests for an estimate, prediction, ranking, or grading, but not value judgments.
    a. How far is the green?
    b. Who will win the election?
    c. Is the second note higher or lower than the first?

5. <u>Descriptive</u>: Requests for descriptions.
    a. Requests for properties or characteristics.
        1. What color is it?
        2. What are the properties of iron?
    b. Requests for examples.
        1. What are some examples of homonyms?
        2. Give me a substance that dissolves in water.
    c. Requests for classifications.
        1. Is NaOH an organic or inorganic compound?
        2. What class of animals does the cat belong to?
    d. Requests for labels or names.
        1. Who is the President of France?
        2. Which part of the brain is the lowest?
    e. Requests for summaries.
        1. Summarize chapter three.
        2. What were the major points of this book?
    f. Requests for reviews.
        1. What have we said so far?
        2. What did the author say about ecology?
    g. Requests for procedures or processes.
        1. How is sulphur mined?
        2. How did you get the answer to this problem?
    h. Requests for chronological sequences.
        1. How did World War I come about?
        2. How did Coolidge happen to become President?
    i. Requests for relationships.
        1. What is the relationship between the Big Dipper and the North Star?
        2. How is spelling ability related to reading ability?
    j. Requests for comparisons.
        1. Compare Ohio State to Michigan.
        2. What do these words have in common?
    k. Requests for contrasts.
        1. Contrast materialism with idealism.
        2. What is the difference between organic and inorganic compounds?

B. Analytic: Questions about the relationships between verbal, logical, or mathematical symbols.

1. Linguistic: Requests for definitions or the relationship between words.
    a. Define 'placid'.
    b. What does 'ambiguous' mean?

2. Logical: Requests for the laws of logic or the relationship between logical symbols.
    a. Why is this argument invalid?
    b. Does that conclusion follow?

3. Mathematical: Requests for the laws of mathematics or the relationship between mathematical symbols.
    a. What is 6 x 7?
    b. Why does angle A plus angle B equal 180 degrees?

C. Normative Judgment: Requests for evaluations, obligatory judgments, or justifications.

1. Value: Requests for evaluations (i.e., whether something is good or bad, right or wrong, etc.).
    a. Was that a good movie?
    b. Was the verdict fair?

2. Obligation: Requests for obligatory judgments (i.e., whether something should or should not be done).
    a. Should Nixon be impeached?
    b. What should be done about tardiness?

3. Justificatory: Requests for the reasons, grounds, evidence, criteria, etc., for making a value or obligation judgment.
    a. Why is that a good movie?
    b. Why do you think we should expell students for tardiness?

D. Preference: Questions about likes or dislikes.
    1. Do you like ice cream?
    2. Don't you like coming to school?

E. Metaphysical: Questions about supernatural beings, events, etc., which have no agreed upon method for arriving at an answer.
    1. Does God exist?
    2. Why is there something, rather than nothing?

II. Rhetorical Questions: Sentences with an interrogative

form but not an interrogative function (i.e., they
do not request information).

    A.   Imperative: Sentences with an interrogative form
       but an imperative function.
         1. Will you open the window, please?
         2. Can you draw it this way?

    B.   Declarative: Sentences with an interrogative form
       but a declarative function.
         1. Is that any way to treat a law-abiding citizen?
         2. If we agree to Medicare, can socialism be far
           behind?

    C.   Exclammatory: Sentences with an interrogative form
       but an exclammatory function.
         1. Is that necessary?!
         2. What the hell's going on?!

III. Ambiguous Questions: Questions that are functionally
or semantically ambiguous.

    A.   Functional: Questions that can be interpreted in
       two or more ways functionally.
         1. Why don't you do it this way?
         2. Why won't this approach work?

    B. Semantic: Questions that can be interpreted in two
      or more ways semantically.
         1. Explain the Civil War.
         2. Why do animals grow long hair in the winter?

An Analysis

The advantages of the above classroom question
classification system over existing systems are numerous.
First, it has the most comprehensive conceptual framework of
any system yet considered. That is, it is able to classify
nearly all questions that might occur in a normal classroom.

The alternative system is somewhat similar to Wilson's
system, except that a new twist is added in the way of a
functional basis for classifying questions--interrogative or
rhetorical. This, along with the sub-categories of interro-

gative questions, provides the much-needed overall conceptual framework heretofore lacking in classroom question classification systems. Moreover, the addition of the ambiguous questions category virtually eliminates category overlap. Since the purpose of a classroom question classification system is to improve teachers' questioning, a category for their mistakes is a necessity. If it is not clear how to classify a particular question, then it is simply recorded under the ambiguous questions category. It is important to realize that the questions in this category must be recorded verbatim in order to be used as instructively as possible in improving teachers' questioning.

Another advantage of this system is that the categories and sub-categories of the interrogative questions section are delineated on an ordinary language basis according to semantic cues within the questions. This is an important feature because it allows this section to remain psychologically and metaphysically neutral. That is, it is not tied to any psychological or metaphysical theory; it makes no commitments to behaviorism, etc., or to the ontological status of "cognitive processes" or "logical operations."

Conclusion

Thus far, the overwhelming frequency of the use of questions as pedagogical tools in the classroom has been noted, as well as the demonstrated ability to improve

teachers' questioning techniques through the use of classroom

question classification systems. It should be recognized,

however, that the construction of a good question classifi-

cation system does not guarantee that teachers will automati-

cally ask good question. Clearly, instruction in the use of

the system and the inculcation of the tendency to use the

system are required before questioning techniques can be

improved. On the other hand, a good system makes the

instruction in the use of it much easier and the tendency to

use it more likely.

Chapter Summary

In the introductory section of this chapter it was

noted that a great number of classroom question classifica-

tion systems have already been proposed. The most popular

one, devised by B. S. Bloom, was examined and found wanting

in several ways (category overlap, exclusion of several

kinds of common classroom questions, vague and abstract

definitions, etc.). The major strength of Bloom's system is

its emphasis on asking questions requiring more than just

memory. A second system, constructed by Smith and Meux, was

also analyzed. Its main advantage--the ability to point out

semantically ambiguous questions--was cancelled by its

weaknesses (category overlap, poor organization, etc.). In

order to rectify the weaknesses of Smith and Meux's system,

John Wilson's statement classification system was examined

for possible adaptation to a question classification system.

Finally, an alternative classroom question classification system which incorporated most of the desirable features of the three previously mentioned systems and avoided most of their weaknesses was proposed.

Recommendations for Future Research

Obviously, the aforementioned outline of the alternative classroom question classification system is just that, an outline. Further conceptual refinement of its categories and sub-categories are no doubt possible. This, then, is one area that requires more work by philosophers of education. In addition to the philosophical work called for, some empirical testing of its reliability and validity is required. That, however, is a task that is beyond the scope of this study and can only be handled by educators trained in empirical research methods.

A third area that needs further research is related to the nature of the existing classroom question classification systems. All the existing systems attempt to describe the kinds of questions teachers actually ask in the classroom, and this is indeed a worthy task. However, an important concern that has unfortunately been largely neglected is a determination of the kinds of questions that teachers ought to ask. So far, only two brief studies of this nature have been attempted using classification systems.[27] Much has

[27]See Ladd and Anderson, "Level of Inquiry;" and Hunkins, "Analysis and Evaluation Questions."

been written by educators on the subject of good questions and good questioning, but this body of literature has by and large ignored classroom question classification systems.

Finally, it should be noted that instruction in the use and benefits of classroom question classification systems should not be limited to teachers. Clearly, class-room discussions could be improved by familiarizing students as well as teachers with question classification systems. Thus, these systems and their pedagogical applications should be taught not just by teacher trainers, but also by classroom teachers.

Chapter 5

CONCLUSION

The purpose of this chapter is to serve as a conclusion to this study of the logic of classroom questions. Accordingly, it is divided into two sections--the first devoted to a summary of this study and the second to suggesting some recommendations for future research on the logic of classroom questions.

A Summary of this Study

In order to more systematically summarize this study this section is divided into four sub-sections containing summaries of chapters one, two, three, and four respectively.

Chapter One

The purpose of chapter one was to provide an introduction to this study of the logic of classroom questions. Accordingly, it was divided into sections devoted to 1.) the scope and methodology of this study, 2.) the relationship between logic and pedagogy, 3.) the relationship between questioning and teaching, and 4.) an outline of the remaining chapters in this study.

It was noted in the first section that the focus of

this study is on the logic of classroom questions and the pedagogical implications thereof. Moreover, it is a study in philosophy of education, and its intended audience includes both philosophers and educators. Furthermore, it was observed that the pedagogical applications of this study are very broad in nature. That is, it is directed towards teachers in general, irrespective of their subject-matter area, grade level, etc. In order to further clarify the methodology employed throughout this study it was stipulated that this study was an exercise in analytic philosophy of education.

The second section examined the relationship between logic and pedagogy and stated that throughout this study the concept of 'logic' would not be restricted to the academic sense of argument soundness, but instead will be used in a broader, more common sense kind of way. In this broader sense 'logic' is exhibited by everyone who thinks or communicates. Thus, the study of the logic of classroom questions is the study of the grammar of classroom questions, an examination that includes syntactic, semantic, and pragmatic considerations. In short, it is a study of the uses and abuses of classroom questions. It was also noted in this section that it is possible to improve the teaching techniques of any teacher by improving his/her ability to perform and evaluate the logical activities of teaching, and that the major thrust of this study is directed towards questioning as a logical activity, but that this is not meant to deny the

importance of strategy in questioning.

The third section, an examination of the relationship between questioning and teaching, concluded that there is a great deal of empirical justification for a study of the use of questions in teaching, since it is a well-documented fact that the use of questions is one of the most common teaching techniques even though questioning is not a necessary condition for teaching.

Finally, chapter one concluded with a section outlining the remaining chapters in this study.

Chapter Two

The purpose of chapter two was to lay some logical groundwork in order to avoid some logical problems that could arise in chapters three and four. Since chapter three considered the logical characteristics of classroom questions and chapter four examined classroom question classification systems, it was suggested that before these two tasks can be accomplished a prior question must be answered--namely, What is a question? That is, it is important to determine what kinds of things are going to count as questions before determining their desirable logical characteristics or classifying them. Thus, clarifying the notion of 'question' is a prerequisite to a study aimed at improving classroom questioning techniques.

The first section of this chapter examined two attempts to reduce questions to other sentence types. It

was concluded that questions could not be reduced to state-
ments, but a decision was temporarily postponed on whether
questions were reducible to commands. The second section
analyzed the relationships between questions and the other
sentence types--statements, commands, and exclamations--in
light of the distinction between sentence from and sentence
function. It was concluded that:

      I.   Sentences with an interrogative form can
          _function as interrogatives, declaratives,
          imperatives, exclamations, or any
          combination thereof.

     II.   Sentences with declarative, imperative, or
          exclammatory forms can function as
          interrogatives.

   III.   Some sentences with interrogative forms are
          functionally ambiguous, and it may be
          impossible to tell, even in context, which
          function is intended.

It was decided in the third section that the interrogative
function was reducible to the imperative function, but that
for pedagogical reasons 'question' would mean 'any sentence
with either an interrogative form or function' throughout
the remainder of this study. Chapter two concluded with a
chapter summary and some recommendations for future research
on the subject matter of this chapter.

Chapter Three

        In the opening paragraph of chapter three it was
noted that it has long been known that some questions are
good questions while others are bad questions. In addition,
it was observed in the introduction of this chapter that

questions can be evaluated two different ways, strategically
or logically. While it is important for questions to be
good both strategically and logically, this chapter concen-
trated on searching for the logical characteristics of good
questions. A basic assumption of this chapter was that if a
question contains no logical flaws then it is more likely to
allow students to acquire knowledge than a logically defec-
tive question.

The first characteristic to be examined was clarity,
and it was decided that this was indeed an important charac-
teristic of good questions, but that the notion of 'clarity'
was itself too vague to be very useful as advice to the
practicing teacher. Thus, in an attempt to be more specific,
ambiguity and vagueness were examined. Three types of
ambiguity were distinguished--functional, semantic, and
syntactic--and all three were judged to be characteristics to
avoid when constructing questions. Vagueness was divided
into two kinds--semantic and syntactic--and it was concluded
that the presence of either kind of vagueness need not
necessarily render a question defective. Vague questions are
problematic only when they are not recognized as such and
used as if they were precise.

Next, a criterion proposed by Bandman, syntactic
combinability, was broken down into two sub-categories--non-
sense syllable questions and questions containing category
mistakes. It was determined that questions falling into

either of these two sub-categories were defective and should be avoided. Another Bandman criterion, presuppositions, was also divided into two sub-categories--complex questions and questions containing false disjunctions. In addition, a third sub-category of this same criterion--question-begging questions--which was overlooked by Bandman was introduced. Again, questions falling into any of these sub-categories were deemed defective.

Finally, answerability was examined and found lacking as a criterion for evaluating questions. It was determined, however, that Bandman's task/success distinction with regards to the notion of 'answer' provided a viable criterion by which to judge whether certain kinds of questions are being misused. Moreover, it was also argued in this section that all metaphysical questions should not be categorized as meaningless, but rather that judgments about their meaning-fulness should be reserved. Chapter three concluded with a chapter summary and some recommendations for future research on the logical characteristics of classroom questions.

Chapter Four

In the introductory section of chapter four it was' noted that a great number of classroom question classifica-tion systems have already been proposed. The most popular one, devised by B. S. Bloom, was examined and found wanting in several ways (category overlap, exclusion of several kinds of common classroom questions, vague and abstract definitions,

etc.). The major strength of Bloom's system was its emphasis

on asking questions requiring more than just recall on the

part of the student answering. A second system, constructed

by Smith and Meux, was then analyzed. Its main advantage--

the ability to point out semantically ambiguous questions--

was cancelled by its weaknesses (category overlap, poor organ-

ization, etc.). In order to rectify the weaknesses of Smith

and Meux's system, Wilson's statement classification system

was examined for possible adaptation to a question classifi-

cation system. Finally, an alternative classroom question

classification system which incorporated most of the desirable

features of the three previously mentioned systems and avoided

most of their weaknesses was outlined. Chapter four concluded

with a chapter summary and some recommendations for future

research on the logic of classroom question classification

systems.

Recommendations for Ruture Research

This study and the conclusions contained therein

should in no way be considered final. Rather, they should be

viewed as a starting place for future research on the logic

of classroom questions. It is with this thought in mind that

the following recommendations are offered.

First, it seems clear that more conceptual work is

needed before the problem of the logical status of questions

is conclusively resolved. Similarly, more work on the concept

of 'question' is needed before an adequate analysis can be

arrived at. Furthermore, it is apparent that the list of

logical characteristics by which to evaluate classroom

questions compiled in chapter three can and should be ex-

panded. Moreover, the subject of chapter four--classroom

question classification systems--would also benefit from

further attention. That is, the alternative system proposed

in that chapter can and should be further refined and

expanded. In addition, more research should be devoted to

curriculum-specific systems--systems based on and restricted

to a specific curriculum (e.g., English, social studies,

mathematics, geography, etc.)--especially since chapter four

of this study was devoted to general systems usable by any

teacher regardless of subject-matter area. Also, it may be

that other factors--such as grade level, socio-economic back-

ground of students, etc.--may necessitate the development of

systems in which such factors are emphasized. Another area

that has been largely neglected is students' questions.

Some educators contend that attention should be focused on

questions asked by students rather than on teachers'

questions. Certainly, it seems worthwhile to increase the

frequency and quality of students' questions in classroom

interaction. Gall notes that:

> ... although it would be of interest to investigate
> the types of question students ask, the more important
> task is to identify the types of question which
> students should be encouraged to ask. For example,
> when introducing a new topic for study, teachers
> should probably ask students what they want to know
> about it. ... Another classroom situation in which
> student questions should probably be elicited occurs

when a teacher has explained a new subject.
Students should be queried about possible lack of
understanding. In fact, one might offer the
hypothesis that students encouraged to ask questions,
in this type of situation will learn more than a
group of students deprived of this opportunity.
Another key area for educational innovation is
the training of students in question-asking skills.
For example, what types of question should students
ask themselves when they read a poem, a social
studies textbook, or a science lesson? It seems
that the shaping of student questioning skills
has been a neglected feature of classroom learning.[1]

Still another area that needs further research is question

sequences, especially follow-up questions. The importance

of this area is again recognized by Gall who suggests the

hypothesis that "follow-up questioning of the student's

initial response has substantial impact on student learning

in classroom teaching situations."[2]

On the other hand, even with all the aforementioned

possibilities for future research, what is most needed is

the establishment of a number of teacher-training programs in

questioning techniques. One way to accomplish this is to

impress teacher-training institutions with the importance of

these programs. This in turn requires more hard empirical

data demonstrating the effects of these programs on teachers

(i.e., that these programs improve teacher questioning), and

the effects of improved teacher questioning on student

learning (i.e., that improved teacher questioning will

[1]Meredith Gall, "The Use of Questions in Teaching,"
Review of Educational Research 40: 716.

[2]Ibid., p. 712.

increase student learning). There have been a few studies indicating the above conclusions are warranted, but more conclusive evidence is needed to convince even the most conservative educators that teacher-training programs in the logic of classroom questions are desirable.

SELECTED BIBLIOGRAPHY

BOOKS

Adam of Balsham. Ars Disserendi. in ed. L. Minio-Paluello.
        Twelfth Centruy Logic, Texts and Studies. Rome:
        Edizioni di Storia e letteratura, 1956, vol. 1.

Aqvist, Lennart. A New Approach to the Logical Theory of
        Interrogatives. Uppsala, N. J.: Uppsala University
        Press, 1965.

Aristotle. Interpretation. 20b27-31.

_____. Sophistical Refutations. 167b39-168a12.

Belnap, Nuel D., Jr. An Analysis of Questions: A Preliminary
        Report. Santa Monica, California: Systems Develop-
        ment Corporation, 1963.

Bloom, Benjamin S. ed. Taxonomy of Educational Objectives:
        Handbook I: Cognitive Domain. New York: David McKay,
        1956.

Carnap, Rudolf. Logical Syntax of Language. trans. Amethe
        Smeaton. London: K. Paul, Trench, Trubner and Company,
        Ltd., 1937.

Clements, H. M., Fielder, William R., and Tabachnick, B. R.
        Social Study: Inquiry in Elementary Classrooms.
        New York: Bobbs-Merrill Company, Inc., 1966.

Dewey, John. How We Think. Boston: Heath, 1933.

Douglass, Malcolm P. Social Studies: From Theroy to Practice
        in Elementary Education. New York: Holt, Rinehart,
        and Winston, Inc., 1969.

Emmerig, Louis. Can the School Build a New Social Order?
        Amsterdam: Elservier Scientific Publishing Company,
        1974.

Ennis, Robert H. Logic in Teaching. Englewood Cliffs, N. J.:
        Prentice-Hall, Inc., 1969.

_____. "Readiness to Master a Principle." in _Psychological Concepts in Education_. eds. B. Paul Komisar and C. J. B. Macmillan. Chicago: Rand McNally and Company, 1967, pp. 51-59.

Gallagher, James J. "Research on Enhancing Productive Thinking." _Nurturing Individual Potential_. Washington, D. C.: Association for Supervision and Curriculum Development, 1964, pp. 52-53.

Green, Thomas F. _The Activities of Teaching_. New York: McGraw-Hill Book Company, 1971.

Groisser, Philip. _How to Use the Fine Art of Questioning_. Englewood Cliffs, N. J.: Prentice-Hall, Inc., 1964.

Harrah, David. _Communication: A Logical Model_. Cambridge: M.I.T. Press, 1963.

Hunkins, Francis P. _Questioning Strategies and Techniques_. Boston: Allyn and Bacon, Inc., 1972.

Jeffreys, Harold. _Theory of Probability_. 2d ed. Oxford: Clarendon Press, 1948.

Jespersen, Otto. _The Philosophy of Grammar_. New York: W. W. Norton and Company, Inc., 1965.

Kneller, George F. _Logic and Language of Education_. New York: John Wiley and Sons, Inc., 1966.

Martin, Jane R. _Explaining, Understanding, and Teaching_. New York: MacGraw-Hill Book Company, 1970.

Morgan, Jack C., and Schreiber, Joan E. _How to Ask Questions_. How to Do It Series. Washington, D. C.: National Council for the Social Studies, 1969.

Munitz, Martin. _The Mystery of Existence_. New York: Appleton Century Crofts, 1965.

O'Connor, D. J. _An Introduction to the Philosophy of Education_. London: Routledge and Kegan Paul, 1968.

Onions, C. T. _An Advanced English Syntax_. London: Routledge and Kegan Paul, 1969.

Plutarch. "The Life of Alexander." _Plutarch's Lives_. trans. Mr. Evelyn. London: Jacob Tonson, 1699.

Pratte, Richard. Contemporary Theories of Education. Scranton, Pennsylvania: Intext Educational Publishers, 1971.

Sadock, Jerold M. "Whimperatives." Studies Presented to Robert B. Lees by His Students. eds. Jerold M. Sadock and Anthony L. Vanek. Edmonton, Alberta, Canada: Linguistic Research, Inc,, 1970, pp. 223-238.

Sanders, Norris M. Classroom Questions: What Kinds? New York: Harper and Row, 1966.

Scheffler, Israel. The Language of Education. Springfield, Illinois: Charles C. Thomas, 1960.

Searle, John R. Speech Acts. London: University Press, 1969.

Smith, B. Othanel, and Meux, Milton O. A Study of the Logic of Teaching. Urbana, Illinois: University of Illinois Press, 1970.

Soltis, Jonas F. An Introduction to the Analysis of Educational Concepts. Reading, Massachusetts: Addison-Wesley Publishing Company, 1968.

Toulmin, Stephen. The Place of Reason in Ethics. Cambridge, Mass.; The University Press, 1950.

Whately, Richard. Elements of Logic. London: B. Fellowes, 1826.

Wilson, John. Language and the Pursuit of Truth. Cambridge, England: The University Press, 1969.

Wittgenstein, Ludwig. Philosophical Investigations. trans. G. E. M. Anscombe. Oxford: Basil Balckwell, 1953.

PROCEEDINGS

Bambrough, Richard. "Unanswerable Questions." Proceedings of the Aristotelian Society, Supplementary Volume, 1966.

Bandman, Bertram. "What Makes and Educational Question Right or Wrong?" Philosophy of Education 1967: Proceedings of the Twenty-Third Annual Meeting of the Philosophy of Education Society, pp. 127-140.

McCawley, Noriko. "Boy! Is Syntax Easy!" Papers from the Ninth Regional Meeting Chicago Linguistic Society. Chicago: n.p., 1970, pp. 369-377.

Macmillan, C. J. B. "Questions and the Concept of Motivation."
        Philosophy of Education 1968: Proceedings of the
        Twenty-Fourth Annual Meeting of the Philosophy of
        Education Society, pp. 239-251.

Sadock, Jerold M. "Speech Act Idioms." Papers from the Eighth
        Regional Meeting Chicago Linguistic Society. Chicago:
        n.p., 1972, pp. 329-339.

JOURNAL ARTICLES

Aschner, Mary J. "Asking Questions to Trigger Thinking."
        NEA Journal 50 (1961): 44-46.

Bramberger, Sylvan. "Questions." Journal of Philosophy 63
        (October 27, 1966): 598.

Carner, Richard L. "Levels of Questioning." Education 83
        (1963): 546-550.

Clements, Richard D. "Art Student-teacher Questioning."
        Studies in Art Education 6 (1964): 14-19.

Cunningham, Harry A. "Types of Thought Questions in General
        Science Textbooks and Laboratory Manuals." General
        Science Quarterly 9 (1925): 91-95.

Davis, O. L., and Hunkins, Francis P. "Textbook Questions:
        What Thinking Processes Do They Foster?" Peabody
        Journal of Education 43 (1965): 285-298.

Davis, O. L., and Tinsley, Drew C. "Cognitive Objectives
        Revealed by Classroom Questions Asked by Social
        Studies Student Teachers." Peabody Journal of
        Education 45 (1967): 21-26.

Enokson, R. "Simplified Teacher Question Classification
        Model." Education 94 (1973): 27.

Fraenkel, Jack R. "Ask the Right Question!" Clearing House
        41 (December 1966): 199-202.

Gall, Meredith. "The Use of Questions in Teaching." Review
        of Educational Research 40: 707-721.

Gallagher, James J. "Expressive Thought by Gifted Children
        in the Classroom." Elementary English 42 (1965):
        559-568.

UNPUBLISHED THESES AND PAPERS

Adams, Thomas H. "The Development of a Method for Analysis of Questions Asked by Teachers in Classroom Discussion." Ph.D. dissertation, Rutgers University, 1964.

Clegg, Ambrose A., Jr., Farley, George T., and Curran, Robert J. "Training Teachers to Analyze the Cognitive Level of Classroom Questioning." Research Report no. 1, Applied Research Training Program, Boston, University of Massachusetts, 1967.

Crump, Claudia, "Self-Instruction in the Art of Questioning in Intermediate-Grade Social Studies." Ph.D. dissertation, Indiana University, 1969.

Elliot, Dale. "The Grammar of Emotive and Exclammatory Setences in English." Ph.D. dissertation, The Ohio State University, 1971.

Farley, George T., and Clegg, Ambrose A., Jr. "Increasing the Cognitive Level of Classroom Questions in Social Studies: An Application of Bloom's Taxonomy." paper presented as part of the symposium "Research in Social Studies Education" at the American Educational Research Association Annual Convention, Los Angeles, 8 February 1969.

Floyd, William. "An Analysis of the Oral Questioning Activity in Selected Colorado Primary Classrooms." Ph.D. dissertation, Colorado State College, 1960.

Guszak, Frank J. "Questioning Strategies of Elementary Teachers in Relation to Comprehension." paper presented at the International Reading Association Conference, Boston, Massachusetts, 24 April 1968.

Moyer, J. R. "An Exploratory Study of Questioning in the Instructional Processes in Selected Elementary Schools." Ph.D. dissertation, Columbia University, 1966.

Schreiber, Joan E. "Teachers' Question-asking Techniques in Social Studies." Ph.D. dissertation, University of Iowa, 1967.