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: Approved By

Dr. Gerald M. Reagan

Dr. Richard Pratte

Dr. Philip L. Smith

Gerald M. Reagan

Adviser

Academic Faculty of Curriculum and Foundations
Copyright by
Rodney Paul Riegle
1974
VITA

June 28, 1946... 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


FIELDS OF STUDY

Major Field: Philosophy of Education


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

VITA ......................................................... ii

Chapter

I. INTRODUCTION ........................................... 1
   The Scope and Methodology of this Study .......... 1
   The Relationship between Logic and Pedagogy .. 4
   *The Relationship between Questioning and Teaching* ........................................... 9
   An Outline of the Remainder of this Study .... 11

II. THE LOGICAL STATUS OF QUESTIONS .................. 13
   The Reduction of Questions to Other Sentence Types ........................................... 14
   The Reduction of Questions to Statements ...... 16
   The Reduction of Questions to Commands ..... 18
   *The Relationship between Questions and Other Sentence Types* ......................... 20
   Sentence Form Vs. Sentence Function ........... 20
   Questions and Statements ......................... 23
   Questions and Commands ............................ 25
   Questions and Exclamations ....................... 27
   Conclusions ........................................... 29
   *The Concept of 'Question'* ......................... 29
   The Searle/Bandman Dispute ....................... 29
   The Use of 'Question' in this Study ............. 31
   Conclusion ............................................ 32
   Chapter Summary ..................................... 32
   Recommendations for Future Research .......... 33

III. THE LOGICAL CHARACTERISTICS OF CLASSROOM QUESTIONS .................................. 34
   Introduction ......................................... 36
   The Activities of Teaching ....................... 36
   The Evaluation of Questions ...................... 37
   Clarity ................................................. 39
   Hunkins' Clarity Criterion ......................... 39
   Grosiss's Clarity Criterion ....................... 41
   Ambiguity .............................................. 43
   Semantic Ambiguity .................................. 44
Functional Ambiguity ........................................ 46
Syntactic Ambiguity ........................................ 48
Vagueness ..................................................... 49
Semantic Vagueness .......................................... 49
Syntactic Vagueness .......................................... 51
Syntactic Combinability ...................................... 53
Nonsense Syllables ........................................... 54
Category Mistakes ............................................ 56
Presuppositions ................................................ 58
Complex or Loaded Questions ................................ 59
False Disjunctions ........................................... 60
Question Begging .............................................. 63
Answerability ................................................... 65
Conclusion ....................................................... 71
Chapter Summary .............................................. 71
Recommendations for Future Research ..................... 73

IV. THE LOGIC OF CLASSROOM QUESTION CLASSIFICATION
SYSTEMS ....................................................... 74

Introduction .................................................. 75
Bloom's Question Classification System ..................... 77
A Description ................................................... 78
An Analysis ...................................................... 83
Smith and Meux's Question Classification
System .......................................................... 87
A Description ................................................... 87
An Analysis ...................................................... 90
Wilson's Statement Classification System .................... 95
A Description ................................................... 95
An Analysis ...................................................... 96
An Alternative Classroom Question
Classification System ......................................... 99
A Description ................................................... 99
An Analysis ...................................................... 102
Conclusion ....................................................... 103
Chapter Summary .............................................. 104
Recommendations for Future Research ..................... 105

V. CONCLUSION .................................................. 107

A Summary of this Study .................................... 107
Chapter One .................................................... 107
Chapter Two .................................................... 109
Chapter Three .................................................. 110
Chapter Four ................................................... 112
Recommendations for Future Research ..................... 113

SELECTED BIBLIOGRAPHY .................................... 117
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


C. J. B. Macmillan, a portion of a book by Jane Martin, and a monograph by B. O. Smith and M. O. Meux, 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.


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 communicates. 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 treatment 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

---


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 confusion 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, 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, 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:

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 circumstances, 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 instruction. 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 providing 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

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 classroom (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, Stevens 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.\textsuperscript{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.\textsuperscript{12} A study by Moyer in 1965 of twelve elementary-school teachers found

\textsuperscript{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).

that each asked an average of 180 questions during a science lesson. 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. 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 occurred. Would we not still describe him as teaching? What seems to me to be essential to teaching is not that questioning...occur but that it could occur if the appropriate situation were to arise.

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

---


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, presuppositions, 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 classroom question classification systems and how these kinds of systems can be used to improve teachers' questioning techniques. 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


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

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 1913 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

exclamations— is much clearer. It will be shown later that the boundaries between these four types are not entirely distinct either, but they are generally accepted by philosophers 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." This attitude comes under attack from Hamblin who points out that Jeffreys' analysis is clearly inadequate in the case of "exam" questions. 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:

---


7Jeffreys, Probability, p. 378.

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 statements 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 preceding sub-section that exam questions are indeed questions.

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 classified 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 controversy, then, it is important to retrace some steps and re-examine the four sentence types.

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 inverted 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 circumstances. 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.

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. Exclamatory—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. Exclamatory—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 interrogative form but an exclamatory 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 response 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 having 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 interogatives.

Questions and Exclamations

Some paradigm examples of sentences with both an exclamatory 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 exclamatory or a combination exclamatory/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 (exclamatory 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 exclamatory 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 exclamatory
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 ques-
tions 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 subsections, the following conclusions become apparent:

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

II. Sentences with declarative, imperative, or exclamatory 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 interrogative. Indeed, this class of sentences--sentences with an interrogative form and an imperative, declarative, or exclamatory function--are what is generally referred to as rhetorical questions (questions to which no answer is expected).

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 imprecision 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 vacillate 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 exclamatory 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-

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.


Introduction

Before proceeding further, it is important to recognize 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, disciplining, 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

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. For example, Richard Laughlin has proposed ten guidelines for improving classroom questioning techniques, and they are heavily weighted towards

---

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 ...............?"

Unfortunately, there does not exist a correspondingly impressive body of literature on the logical characteristics of good questions. 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


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 questions." 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

---


\(^10\)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.

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.
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 always more

---

14Ibid.
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. 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.

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

16It 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 maître 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 functionally ambiguous. That is, it is not clear whether to interpret certain sentences with interrogative forms as having interrogative, declarative, imperative, exclamatory, or some combination 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 exclamatory 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 embarrassment of the student which eventually leads to the distrust of the teacher.

In addition, some questions are meant to have an exclamationary or a combination exclamationary/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 exclamationary/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 exclamatory/declarative function of the question. And vice versa, sentences like (21) are sometimes interpreted as having an exclamatory/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 vagueness. 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 students), 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.\textsuperscript{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):

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

As with semantic vagueness, syntactic vagueness be-
comes 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. Dating: 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. {\textsuperscript{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}).

\textbf{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

\textsuperscript{18}Richard Pratte, \textit{Contemporary Theories of Education}
(Scranton, Pennsylvania: Intext Educational Publishers,
the syntax of questions, the second concerns their presuppositions, and the third their uses.\(^1\) 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 uncoupled or syntactically incombunligable. 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 incombunligability—nonsense syllable questions and questions that contain category mistakes. Bandman discusses 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 incombunligability.

**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

\(^{1}\)Bandman, "Educational Question," pp. 127-140.
meaningless. Consider the following examples:

36.) Do pirots carulize astractically 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

20Ibid., p. 129.
means to 'nothing' something. Thus, due to these two meaningless expressions containing 'nothing', (40) can be classified as a nonsense syllable question. Similarly, (38) contains 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 syllable questions, and as such are defective due to their meaninglessness.

Category Mistakes

Some questions are defective because of the combination 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 figurative uses of language and category mistakes lies in the intent 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 consideration 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

22Ibid.

questions and questions containing a false disjunction. The following two sub-sections will examine these two sub-categories, 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 presuppose 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--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.24

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).

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 dropping 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 questions, 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

26Ibid., 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 disjunctions.

**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 P. J. O'Connor:

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

---


29It 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:

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

31Johnson, "How to Ask a Question," p. 207.
58.) There are no questions without answers. 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 interrogative form (verb, subject, object) regardless of their function, and sometimes applied only to sentences with both an interrogative form and an interrogative function (requesting 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. 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/

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

33Ibid., pp. 133-139.

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 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 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.\(^1\)

\(^1\) 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


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 emphasis on the development of categories into which teachers' questions can be classified. At least twenty-one classification systems for classroom questions have been devised in recent years.2

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 elementary school reading groups, and Schreiber's system for classifying 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

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 classification system is outlined in that section. Finally, the sixth section contains a chapter summary and some recommendations 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."

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.

---

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 recitation, 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 evaluative 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. 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. 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, Gallacher found that most teachers' questions were at the "cognitive-memory" level. 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. 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.


5Guilford, "The Structure of the Intellect."

6Gallacher, "Expressive Thought."


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. 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. Using the same approach, Pfeiffer and Davis discovered the same emphasis in teacher-made tests.

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.


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. We 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


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 shortcomings 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 criticizing New Deal politics?" is classified as an Analysis question because it requires that students engage in analytic 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.).

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 Ossi 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 comprehend by the term 'nationalism'" which is awkward to say the least, the teacher might say "In your

15Gall, "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

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.  

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

17Bloom, 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 of 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. Reporting: 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. Substituting: 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. Evaluating: 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. Opining: 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. Classifying: 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. Comparing and Contrasting: These ask about the relationship between two or more things.
1. Compare Ohio State with Michigan.
2. Contrast materialism with idealism.

XI. Conditional Inferring: 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 sulfur 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 definitions 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' understanding—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 criticism 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?)


\(^{19}\)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 processes 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 according 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 techniques 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 reliability of their categories ranged from .33 to .88 with .67

20 Smith and Meux, Logic of Teaching, p. 47.
being the median. It appears that the reliability 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 categories: "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 explanation.

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.

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

\[^{21}\text{Ibid., p. 45.}\]
\[^{22}\text{Ibid., pp. 215-225.}\]
\[^{23}\text{Ibid., p. 3.}\]
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 exclamatory 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.  

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-

---

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

25Refer 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.\textsuperscript{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 exclamatory functions can also be classified as rhetorical questions.

\textsuperscript{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 exclamatory 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 exclamatory.

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

A. Empirical: Questions about the world and our experiences of it.

   a. Why did the pond freeze?
   b. What caused World War I?

2. Teleological: 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?

   a. Why does the liver secrete bile?
   b. What is the function of the pancreas?
4. Non-normative Judgment: 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. Descriptive: 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.
      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 $6 \times 7$?
   b. Why do 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. Exclamatory: Sentences with an interrogative form but an exclamatory 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 classification system does not guarantee that teachers will automatically ask good questions. 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 classification 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

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, classroom 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 statements, 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 exclamatory 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 concentrated 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 defective question.

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. 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—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 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 meaningfulness 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 classification 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 organization, 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 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 outlined. Chapter four concluded with a chapter summary and some recommendations for future research on the logic of classroom question classification systems.

Recommendations for Future 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 expanded. 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 background 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


2Ibid., 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


__________. Sophistical Refutations. 167b39-168a12.


PROCEEDINGS


**JOURNAL ARTICLES**


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


