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Questioning Sequences in the Classroom

THE CLASSROOM STRATEGIES SERIES

CONTENTS

Italicised entries indicate reproducible forms.

INTRODUCTION

Questioning Sequences in the Classroom is part of a series of books collectively referred to as *The Classroom Strategies Series.* This series aims to provide teachers, as well as administrators, with an in-depth treatment of research-based instructional strategies that can be used in the classroom to enhance student achievement. Many of the strategies addressed in this series have been covered in other works, such as *Classroom Instruction That Works* (Marzano, Pickering & Pollock, 2001), *Classroom Management That Works* (Marzano, 2003), *The Art and Science of Teaching* (Marzano, 2007) and *Effective Supervision* (Marzano, Frontier & Livingston, 2011). Although those works devoted a chapter or a part of a chapter to particular strategies, *The Classroom Strategies Series* devotes an entire book to an instructional strategy or set of related strategies.

We begin with a brief but inclusive chapter that reviews the research and theory on questioning. Although you may be eager to move right into those chapters that provide recommendations for practice in schools, we strongly encourage you to examine the research and theory, as it is the foundation for the entire book. Indeed, a basic purpose of *Questioning Sequences in the Classroom* and others in *The Classroom Strategies Series* is to present the most useful strategies based on the strongest research and theory available.

Because research and theory can provide only a general direction for classroom practice, *Questioning Sequences in the Classroom* goes one step further to translate that research into applications for questioning in schools. Specifically, this book suggests a unique strategy for classroom questioning: questioning sequences. Research indicates that the intentional use of targeted questions in a coordinated sequence is an effective way to elicit students' prior knowledge, prompt the discovery of new information, and deepen and extend students' learning in all content areas.

Chapter 1 reviews history, research and theory relevant to classroom questioning practices. One of the major conclusions of the chapter is that individual questions do not promote deep understanding and higher cognition as effectively as questioning sequences. In this book, we present questioning sequences in four phases: the detail phase, the category phase, the elaboration phase and the evidence phase. In chapter 2, we describe and exemplify each phase and give teachers concrete and specific guidance about how to immediately implement questioning sequences in their classrooms. Chapter 3 explains how to teach students to glean information from all types of texts to answer questions during each of the four phases of a questioning sequence. To answer questions, students will need to use information from one of two potential sources: prior knowledge or external sources. These external sources might be traditional print texts, graphic texts, multimedia texts, electronic texts, Internet texts or others. Chapter

4 highlights different response techniques that teachers can use when students are responding individually or working in groups to answer questions. We also review a number of techniques that teachers can use to facilitate group interaction as students work collaboratively. Finally, chapter 5 gives teachers detailed guidance about how to plan questioning sequences that occur during a single class period or stretch across several classes.

Throughout the book, we exemplify various strategies using classroom vignettes. These narratives describe how each strategy might look in a teacher's classroom. This allows readers to see how our suggestions apply to their year level and content area(s). Additionally, appendix B presents examples of questioning sequences based on example standards for each year level P–12. These focus on a variety of content areas, including reading, writing, mathematics and science.

How to Use This Book

Educators can use *Questioning Sequences in the Classroom* as a self-study text that provides an in-depth understanding of effective questioning in the classroom. As you progress through the chapters, you will encounter comprehension questions. It is important to complete these questions and compare your answers with those in appendix A. Such interaction provides a review of the content and allows a thorough examination of your understanding. Groups or teams of teachers and administrators who wish to examine the topic of questioning in depth may also use *Questioning Sequences in the Classroom*. When this is the case, teams should answer the questions independently and then compare their answers in small- or large-group settings.

Chapter 1

RESEARCH AND THEORY

Despite its popularity as an instructional strategy, classroom questioning has been the subject of educational debate for more than one hundred years. To the surprise of many, the extant research does not clearly describe the exact nature of effective questioning.

The debate regarding questioning began in 1912, when Romiett Stevens investigated teachers' questioning practices. One of the variables she examined was how many questions teachers ask each day. She reported that "the average number of questions for a day's activity is 395" (p. 15) with questions consuming "eight-tenths of the school time" (p. 6). Since Stevens's work, various researchers have examined the frequency of classroom questions and reported similar results (see table 1.1). Obviously, the sheer volume of questions asked each day renders questioning an important variable in the classroom.

Table 1.1: Research Findings Regarding Number of Questions Asked by Teachers

Floyd, 1960*	On average, primary teachers asked 348 questions each during a school day.
Moyer, 1966*	On average, primary school teachers asked 180 questions each during a science lesson.
Schreiber, 1967*	On average, year-five teachers asked 64 questions each during a thirty-minute social studies lesson.
Dunkin & Biddle, 1974	Compiled research (Dahllöf & Lundgren, 1970; Furst, 1967; Furst & Amidon, 1967) indicated that one-tenth to one-sixth of all classroom interactions occur in the form of questions asked by the teacher.
Nash & Shiman, 1974	Despite teachers' perceptions that they asked 12–20 questions each half hour, they actually asked 45–150 questions each half hour.
Levin, 1981	Compiled research (Floyd, 1960; Gall, 1970; Schreiber, 1967; Stevens, 1912) indicated that teachers asked 300–400 questions in a typical school day.
Gambrell, 1983	Year-three teachers asked a question every 43 seconds.

*As cited in Gall, 1970.

Probably the most important finding from Stevens's (1912) research was that in some classes, asking many questions improved student performance, but in other classes, it did not. Simply asking questions,

then, might not be an advisable classroom practice. This finding should have spawned immediate concern about how best to ask effective questions. Unfortunately, it wasn't until decades later that the nature of effective versus ineffective questions was systematically addressed.

Early Conceptions of Effective Questioning

Beginning in the 1950s, researchers started studying effective questioning in earnest, operating under the principle that, once identified, effective questioning techniques could be explicitly taught to teachers, thus improving student performance. This effort required researchers to develop "sophisticated methods of systematic observation and analysis" (Wilen & Clegg, 1986, p. 153). Specifically, they needed a way to classify questions. Meredith "Mark" Gall (1970) identified a number of question classification systems that were created between 1950 and 1970 (including Adams, 1964; Aschner, 1961; Carner, 1963; Clements, 1964; Gallagher, 1965; Guszak, 1967; Moyer, 1966; Pate & Bremer, 1967; Sanders, 1966; and Schreiber, 1967). In many of these systems, researchers classified questions using existing models of types of cognition. For example, Mary Jane Aschner (1961) based her question classification system on Joy Paul Guilford's (1959) "Three Faces of Intellect" model. The most well-known of these efforts was Norris Sanders's (1966) adaptation of Bloom's (1956) taxonomy to questioning types.

Although its original purpose has been mostly forgotten, Bloom's taxonomy was initially written to help university examiners (people who write tests for university students) design assessment items. Benjamin Bloom (1956) and his colleagues sought to develop a reliable system for classifying skills and knowledge into educational objectives. This purpose was explicit in the book's title, *Taxonomy of Educational Objectives: The Classification of Educational Goals*. Bloom's taxonomy classified educational objectives into six hierarchical levels: knowledge (1.00), comprehension (2.00), application (3.00), analysis (4.00), synthesis (5.00) and evaluation (6.00). As Lorin Anderson and his colleagues explained in their 2001 revision of Bloom's taxonomy,

> With the Taxonomy in place, examiners do not have to approach every objective as a unique entity. Rather, they can say to themselves, "Oh, this is an analysis objective. I know how to write examination items for analysis objectives." They can pull out their "templates" … and, with modifications dictated by differences in subject matters, write several items in a fairly short time. (p. 35)

In other words, the taxonomy was designed to make the task of writing assessment items for various educational objectives (or learning goals) easier. In their original publication, Bloom (1956) and his colleagues were careful to warn against overextension of the taxonomy:

> It should be noted that we are not attempting to classify the instructional methods used by teachers, the ways in which teachers relate themselves to students, or the different kinds of instructional materials they use. We are not attempting to classify the particular subject matter or content. What we are classifying is the *intended behaviour* of students – the ways in which individuals are to act, think or feel as the result of participating in some unit of instruction. (p. 12)

When they revised Bloom's taxonomy in 2001, Anderson and his colleagues extended this caution, saying, "specifying a learning objective does not automatically lead to a prescribed method of instruction" (p. 257). Bloom, Anderson and their colleagues were very careful to note that the levels of the taxonomy were *never designed* to classify instructional methods such as questioning, or how teachers relate to students, as in a classroom discussion.

American colonies in 1740 might encounter the combined list in table 3.4. Notice that it uses words and numbers to give more information than the simple list.

Table 3.4: Combined List – Populations of American Colonies in 1740

Colony	Population in 1740	Colony	Population in 1740
Georgia	2021	New York	63 665
Delaware	19 870	Pennsylvania	85 637
New Hampshire	23 256	Connecticut	89 580
Rhode Island	25 255	Maryland	116 093
South Carolina	45 000	Massachusetts	151 613
New Jersey	51 373	Virginia	180 440
North Carolina	51 760		

Source: U.S. Bureau of the Census, 1975.

Here, the combined list specifies the population of each colony. Simple and combined lists are often organised in specific ways. The simple list in table 3.3 is organised alphabetically. The combined list in table 3.4 is organised according to the population of each colony, from the lowest population (Georgia) at the beginning to the highest population (Virginia) at the end. Lists could also be organised chronologically. If a student were looking for information about colonial imports and exports, he or she might encounter a chronological combined list like the one in table 3.5.

To interpret this type of combined list, students would need to understand that each column contains a category of information (denoted in the header for each column) and that each row gives the value of exports for a specific year and region.

Table 3.5: Combined List – Values of Colonial Exports by Region and Year

Year	Region	Exports	Year	Region	Exports	Year	Region	Exports
1710	New England	£31 112	1740	New England	£72 389	1770	New England	£148 011
1710	Middle colonies	£9 480	1740	Middle colonies	£36 546	1770	Middle colonies	£97 991
1710	Southern colonies	£209 227	1740	Southern colonies	£599 481	1770	Southern colonies	£769 533

Source: U.S. Bureau of the Census, 1975.

Combined lists can display any amount of information through the addition of columns and rows. However, Kirsch and Mosenthal (1989) pointed out that combined lists quickly become redundant

may show those the author wants to emphasise. Additionally, causation schematics typically give equal weight to each cause they feature. For example, figure 3.11 seems to indicate that mercantilism, the Great Awakening and Enlightenment ideas were equally responsible for the American Revolution, which is not necessarily the case. Students should be aware of the biases that may be present in schematics of this type and evaluate them carefully to detect misleading information.

The second type of schematic, a procedural schematic, shows how things move or function or how to do something. When looking for an answer to the question, What was the effect of the printing press on the Revolutionary War? students might encounter a procedural schematic like the one in figure 3.12. The schematic in figure 3.12 might prompt students to infer that printing presses allowed information to be reproduced more efficiently, allowing for wider distribution of ideas, which in turn fuelled revolutionary thinking.

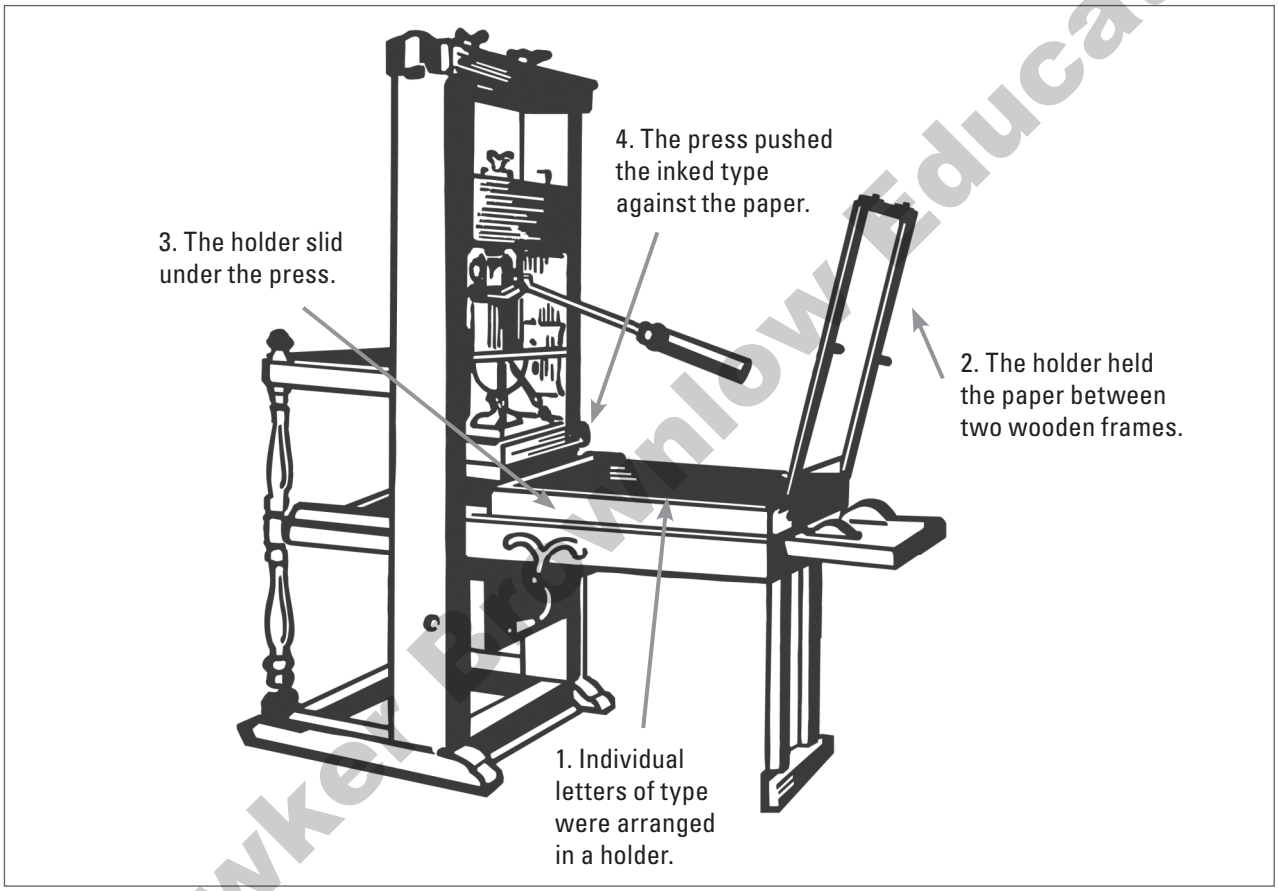

Figure 3.12: Procedural schematic for a colonial printing press.

Figure 3.12 fulfils a double purpose. Like a labelled picture, it gives students information about what the various parts of the printing press are called. However, using arrows and descriptive sentences, it also explains how one would go about using the printing press to print a newspaper or other document. The overlapping nature of various texts illustrated by this procedural schematic is an important feature of all texts. Often, two texts will give the same information, but one will give a better or more complete version of the information. Students should be aware of how much information a text conveys and select the most useful texts to study.

The final type of mimetic text is a process schematic. Process schematics show how something changes over time. Pictures in science textbooks of the stages of metamorphosis or the stages of plant