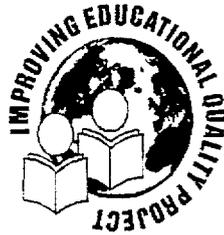


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**HOW DO TEACHERS USE TEXTBOOKS AND
OTHER PRINT MATERIALS?:**

A REVIEW OF THE LITERATURE



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INTRODUCTION

Background

An important conclusion of researchers during the past fifteen years is that the availability of textbooks in schools in developing countries is associated with student achievement: Students do better on tests when there are textbooks in the classroom (Heyneman et al., 1978; Fuller, 1987; Fuller and Clarke, 1993). Yet, we know very little about how teachers and students actually use these textbooks in order to help students learn. In fact, we know little about this in either developing countries or in the United States.

When educators focus on textbooks, they most often look at the quality of the books--their content and format--and their appropriateness for students in terms of their level of vocabulary and ethnic and gender biases. Assuming that textbooks dictate the content of most instruction, educators, parents, and politicians want to know what the books have to say. But what does it matter what they say if students rarely read them? And what if they spend lots of time reading them, but do not learn from them?

Our review of the literature on teachers' use of textbooks and other print materials will show that we know very little about what teachers do to help students learn from textbooks.

We have reviewed the literature with a primary interest in the data collection methods used in empirical studies conducted on this topic. Our purpose is very specific. Educational researchers working with the Improving Educational Quality project in South Africa want to learn more about how teachers in the public elementary schools for black children use the materials available to them. Most of these materials have been furnished by the government and are judged to be of inferior quality. Many are supplemented with materials produced recently by nongovernmental organizations (NGOs). These vary considerably from conventional textbooks, and are considered to be of higher quality.

But only in recent years have educators from outside the government been allowed to enter classrooms or to ask questions about what teachers and students do. Thus, it is time to find out more about the teaching-learning process in those classrooms and, in particular, how teachers are using the materials they have been given and what the effects of that use have been on student achievement.

To inform this effort, we have reviewed the literature on the availability and use of textbooks and other print materials in both developing countries and the United States.

Guiding questions

The guiding questions for our review of the literature are:

- What questions do researchers pose on the availability and use of materials?
- How do they gather and analyze data to answer these questions?
- What are the contexts within which they have conducted research (what kinds of schools, what countries, what subjects)?
- What findings are emerging, particularly with regard to teachers' planning and instruction and to student achievement?

Context

South Africa is typical of other Third World states in which wealth and privilege are concentrated within a minority. In South Africa, that minority happens to be white. In this respect, there are striking similarities between South African schools and those in Botswana, Namibia, and Zimbabwe. Although the white minority has built a modern infrastructure that, in many ways, reaches deep into the country, most black teachers and students continue to work in Third World conditions. Children have few resources for learning, and teachers few for teaching.

Ultimately, what we learn about teachers' use of textbooks and other materials in South Africa must come from research in South African schools. Although this can be said about many aspects of educational research, it is particularly true about research on textbooks. There is a body of research literature on the links between textbook availability and student achievement in developing countries. But this does not apply to industrialized countries, where books are widely available in schools--and this includes many schools in the so-called "developing" countries of Asia and Latin America. In these countries, "the availability of textbooks is no longer a useful indicator, by itself, of school quality" (Windham, p. 36).

Within industrialized countries, there is also a small body of research literature on teachers' use of textbooks. This research does not try to link textbook use to student achievement. Rather, it is concerned with the extent to which teachers rely on textbooks and to which textbooks constitute the classroom curriculum. We think that both of these groups of research have value in considering research questions in South Africa. But their value lies primarily in terms of just that--research questions and methods--rather than findings.

In this review, we are concerned with the questions and the methods. We also relate findings, because they help to suggest questions. But we do not intend to imply that what happens in classrooms in Botswana, Thailand, or the United States also happens in South Africa.

Organization of the report

We will begin our review with a section on the research focussing on the availability and use of materials in primary schools in developing countries. The next section (and the largest) will be a review of research on materials use in elementary schools in the United States. At the end of this section we will summarize the kinds of research questions that have been posed and the methods used to answer those questions. We will conclude with a discussion of the applicability of this review to planning research in South Africa.

RESEARCH IN DEVELOPING COUNTRIES

The theoretical underpinnings of research on basic education in developing countries has been dominated by the production-function model, according to which learning, or "student achievement" is an "output" of a system that processes a number of "inputs," such as teachers, textbooks, and school facilities. Although this model has recently begun to be challenged (see Samoff, 1993; Fuller and Clarke; 1993, and Jansen, 1994), it is important to look at the relevant research literature, not only because of its dominance in the field, but also because of its significant limitations¹.

By the early 1980s, educational researchers had begun to find impressive results from their studies of what "inputs" into students' education affected their achievement on tests. World Bank publications, in particular, revealed that the availability and use of textbooks and other printed materials was one of the more consistent indicators of achievement (Heyneman, et al., 1978; Heyneman and Loxley, 1983; Fuller, 1987). More recently, Fuller and Clarke have charted research in eight countries showing positive achievement effects from textbook supplies and utilization in primary schools (Fuller and Clarke, 1993).

These researchers looked at both "availability" and "use." But how did they operationalize these terms, what indicators did they use, and what did they find out about how textbooks and other print materials are actually used in the classroom? We reviewed a number of these studies in order to answer these questions.

¹ While it is not within our area of concern to explore the conceptual limitations of World Bank research, we must agree with its critics that it does not take us far toward an understanding of what happens in the classroom to affect student learning. We refer the reader to Samoff (1990), and Samoff (1993), for excellent discussions of the undue influence of World Bank and other international organizations' dominance in research and policy making. Fuller and Clarke (1993) have also questioned the production-function research, in spite of the important role Fuller played in its development.

Most recently, Jonathan Jansen has written an historical account of the "effective schools" literature in both the United States and developing countries in which he points out its limitations in accounting for what affects learning (Jansen, 1994). Fuller and Clarke's and Jansen's critiques of the production-function model and their recommendations for alternative theoretical models very much support our findings here in regard to what we can find out from classroom observations about what contributes to learning or student achievement.

What indicators of "availability" are linked to student achievement?

First, we will look at three studies that were primarily concerned with the "availability" of textbooks--their presence in the classroom. The researchers seem to have assumed that if books were present, they were being used effectively.

Uganda. In 1980, Heyneman and Jamison studied a sample of 61 schools in Uganda, where they created gauges of school quality and compared those to student achievement, which they measured by testing seventh graders. Availability of materials was one indicator of school quality. They determined availability by counting the number of reading materials (textbooks, readers, pamphlets, workbooks, library books) in first and seventh grade classrooms and dividing that number by the number of children in those classrooms. The researchers found that "school quality, of which textbook availability was one indicator in an aggregate, is a powerful determinant of student achievement, though textbook availability itself was not a significant predictor." Yet, any indication that materials were actually used was lacking. While we might assume that teachers did make use of textbooks and other materials, they could have kept them locked in the cupboard.

Nicaragua. In 1981, Jamison and others conducted a controlled experiment in the context of the Radio Math project in Nicaragua. They studied the first grades of 88 schools, in which 20 were supplied with textbooks. Their purpose was to assess the impact of increased textbook availability on student learning. The researchers in Nicaragua were primarily interested in radio, not textbooks. They had already set up an extensive experimental situation to evaluate the impact of radio lessons, and the textbook experiment was carried out in this situation. They attempted to "establish naturalistic conditions" by giving teachers "some encouragement and support that might be expected without the intervention of the experiment." This included a three-hour orientation session before school started. They gave a textbook to each child and a teacher's textbook and supplementary support materials to each teacher. While the researchers made a good effort to encourage teachers to use the textbooks, they did not observe their use in the classroom.

In addition to their findings that the presence of textbooks ("and even more so radio") in the classroom appears to increase student achievement, the researchers learned something about textbook use. Prior to the experiment, in surveying 20 classrooms, they learned from teachers that they use textbooks as resources for themselves, but did not make them available to the children. After the experiment, they asked teachers whether they had used the textbooks: always, sometimes, or never. Four of the twenty teachers reported using them little, if at all. The researchers found no differences in student achievement between classrooms in which textbooks were used

"always" and those in which they were used "sometimes" or "never." Though they suggested the lack of difference might have been methodological (small sample), the finding is interesting when we are concerned about how the actual use of materials affects student achievement.

Philippines. In 1984 Heyneman and Jamison reported on another controlled experiment in the Philippines in which, within one year, students in grades one and two were given new, high quality textbooks, and teachers received training before the school year began in how to use these textbooks. This experiment was done within the context of a major textbook project funded in the Philippines by the World Bank. Unlike the conditions in Nicaragua, where the main interest was in radio, not textbooks, in the Philippines, the government as well as the project funder had a vested interest in the success of the project. Thus efforts were made to help teachers use the books.

They found in this large-scale study (52 schools) that students' achievement test scores in science, mathematics, and Filipino were strongly influenced by being in classes that had received textbooks. They found also that the textbook intervention was "more effective on children whose backgrounds were impoverished." While the government and its benefactor made a strong effort to assure that the textbooks were put to good use, the researchers never actually observed what happened in the classroom.

What indicators of "use" are linked to student achievement?

While Heyneman and Jamison were not primarily interested in variations in teachers' use of textbooks, in the mid-1980s Lockheed and her colleagues examined existing data that provided some information on use.

Thailand. In 1986, Lockheed and others reported on their analysis of longitudinal data (entailing pre-tests and post-tests) to study textbook use in Thailand. They analyzed data from the Second International Mathematics Study (SIMS) conducted by the International Association for the Evaluation of Educational Achievement (IEA). In this study, textbook *use* was a variable in a multi-variate analysis. Teachers reported how often they used published textbooks and material inputs in their instruction of the target class. Their forced-choice options were: rarely or never, sometimes, and often. Sixty-two percent of the teachers reported they "often" used published textbooks in their instruction of the target class. Twenty-nine percent reported they did so "sometimes," and 8 percent reported "never."

The researchers created a dichotomous variable for textbook use by combining "sometimes" with "rarely or never." They found that students of teachers who reported use textbooks "often" scored significantly better on achievement tests. Using other data collected in the study, they were also able to suggest that

- Textbooks substitute for teacher education. (In classes lacking textbooks, teacher education was significantly related to student achievement. In classes with textbooks, teacher education was negligible.)
- Teachers who use textbooks do not necessarily use time more effectively. (There was no interaction between the textbook use and instructional time variables.)
- Textbooks do not necessarily encourage teachers to assign more homework. (Again, there was no interaction between these variables.)

Thus, using multi-variate analysis of data collected from teacher surveys, the researchers drew some conclusions about how teachers use textbooks in Thailand. However, they did not support these data with observations of or interviews about what takes place in the classroom.

Nigeria and Swaziland. In 1989, Lockheed and Komenan analyzed the use of textbooks in Nigeria and Swaziland. As in Thailand, they used the SIMS data collected by the IEA. The researchers found different results in the two countries. In Nigeria, use of published materials was positively related to achievement; in Swaziland, material inputs were unrelated to achievement. They surmised that the differences might have been methodological (sampling, data quality, and reliability), although they might also have been substantive ("effective teaching practices in one country setting could be entirely ineffective in another one"). Again, what is important to our interests is that the researchers relied on forced-choice-option surveys of teachers for their data on materials use.

Summary. In these five studies, we find three different methods researchers have used to define the availability and use of materials:

- Counting the number of books and other materials in the classrooms
- Making books available and encouraging teachers to use them
- Asking teachers to respond to forced-choice questions about their use of books.

In none of these studies did the researchers actually observe teachers using the materials. We will look next at the literature that is emerging on the use--in contrast to availability--of materials.

What has been learned about materials use by observing classrooms?

It is important to note again that the research on textbook availability we have just reviewed has played a dominant role in some of the major donors' decisions on how to invest in education during recent years. Yet, our study suggests that textbook availability may not be causally linked to student achievement because availability does not necessarily mean use. If we are to understand more about how textbooks do or do not affect learning, we need to observe when and how teachers and students use them, and how they fit into the teaching-learning process.

Toward this end, we look first at three studies in which the researcher used classroom observation as a method of data collection. Two of these (Botswana and Ghana) have been conducted more recently, as educational researchers in developing countries have begun to place more importance on accounting for the cultural context of their data. The other (Chile), with which we will begin, was conducted over a decade ago, yet received relatively less attention.

Chile. In 1983, Sepulveda-Stuardo and Farrell studied how teachers in Chile use textbooks. The researchers were interested in more than whether or not teachers had textbooks available.² They wanted to know why they did or did not use them. "The presence of textbooks may not be sufficient since if the teachers think that the textbooks are not useful, they will not use them. The effectiveness of textbooks depends upon the use made of them by teachers."

They sampled 900 eighth-grade students and 400 teachers in 72 schools (not including any in rural areas of poverty). To collect data, they used three instruments: a written questionnaire for all 400 teachers, a written questionnaire for 900 students, and observation of 30 teachers during 20-minute periods in three different sessions. The variables they constructed included teacher preference (do they like to use textbooks?), teacher's experience, teacher's training, and subject area.

² The authors had conducted a previous study with findings suggesting that textbook availability influenced student learning more than other school variables. In this study they measured textbook availability by using a questionnaire to ask students whether they owned a textbook in each of their five academic subject areas.

For our purposes, the most striking outcome of this study is the conflict between how teachers report their use of textbooks and how they are observed using them. Teachers were asked whether they request textbooks for use, either in class or at home.³ Twenty-three percent of the teachers said they always request books; 60 percent said they do sometimes, and 17 percent said they never do. Yet, when teachers were observed, some who said they requested textbooks "sometimes" were never observed using them. In fact, observation showed that teachers tend to exaggerate their use of textbooks when asked on questionnaires. This discovery has implications for not only the Chile study, but for others such as the analyses of SIMS data, in which data was generated only by teacher questionnaires, and the Nicaragua study, which also used teacher questionnaires.

Sepulveda-Stuardo and Farrell caution that

Unfortunately the category "sometimes" may contain large differences in interpretation. This was an unexpected finding; most teachers were anticipated to either rely heavily on textbooks or not use them at all. The study was not designed to explore the "sometimes" response in detail. It is clear that more research into the actual and obviously varying patterns of textbooks use is needed....(p.84).

The researchers also gained some insights from their survey of teachers about their use of materials.

- Seventy-eight percent expressed an ambivalent attitude toward textbook use.
- Fifty-two percent said they do not use textbooks because they are not the best didactic material or they are not necessary.
- Only 49 percent claimed they had had some training or retraining on how to use textbooks in the teaching-learning process.

In analyzing their survey data, they found a "significant relationship between exposure to training in textbook use and the propensity to use textbooks." Also, there was a "slight tendency for more experienced teachers to use textbooks more often than inexperienced teachers." In addition, teachers seemed to use textbooks more often in language than in math or science.

In surveying students, the researchers asked, among other things, about students' perceptions of the usefulness of textbooks in the teaching-learning process. They learned that, generally, students have a positive perception of textbooks, more so

³ In Chile, the school does not furnish textbooks. Students must purchase them.

than their teachers, and that about half use them when they do not understand what the teacher has presented. About one-third, however, will not resort to them for assistance.

Botswana. In 1991 Fuller and Snyder published their findings on a study of how teachers use class time. In this study, the primary method of investigation was classroom observation. The researchers were following up on an ethnographic study of classrooms in Botswana to see if the findings from that study held up across a broader sample of classrooms (Prophet and Rowell, 1993). They observed 127 primary school and 154 junior secondary school classrooms on three separate occasions over a three-month period. They devised observation instruments to quantify teacher and student behavior, including students' use of textbooks and other books or papers.

The researchers found that in primary schools, in 12 percent of the time during their observations, pupils were observed using a textbook. In 1 percent they were using other written materials. In junior secondary schools, in 11 percent of the time students were observed using a textbook. In 5 percent of the time they were reading other written material. Using regression analysis of their data, the researchers discovered that textbooks were more frequently used when English (not math) was being taught, and they were more often used in smaller schools (defined by the number of teachers on the staff).

This study presents information about *how often* students actually use textbooks, it does not tell us *how* they use those books or how the teacher uses the books.

Ghana. In 1993, the Improving Educational Quality (IEQ) project team in Ghana at the University of Cape Coast published a report on their observations of classrooms in six primary schools, two urban and four rural, in Ghana. This was intended as a preliminary investigation of schools and classrooms to identify issues for further study. In particular, the researchers were studying the availability, source, and use of materials. They observed six classrooms, four times for four hours at a time, using a checklist to record observations. They also conducted open-ended interviews of students, parents, teachers, and other members of the community who are connected with the school.

The report consists of an executive summary and six separate school studies; the general conclusions are the same, but particular insights from the researchers vary among schools. In contrast to Fuller and Snyder's study in Botswana, the Ghanaian team did not record how classroom time was spent. Instead, they noted the incidence of various activities, including the use of textbooks, and presented their findings in

prose, not numbers. These findings reveal much about how textbooks are used--and not used--in the classroom, and they suggest reasons for the apparent under use of these resources.

We will quote and paraphrase several sections of the document at length, because they provide rich insights for other researchers. The executive summary states:

In most classrooms, in language lessons, the teacher wrote passages and key words from the textbooks on the chalkboard and instructed students to recite them. Very few teachers encouraged pupils to read their textbooks directly, either aloud or silently. Almost always, teachers wrote exercises from the textbook on the chalkboard for the pupils to complete in their exercise books, even though the students could have used their textbooks.... In math, teachers copied examples and exercises from textbooks and workbooks onto the chalkboard. Pupils did class exercises in their exercise books, rarely directly in their textbooks or workbooks.... When science was taught, which was not often or regularly, the chalkboard was used less frequently, but neither were textbooks often used. Teachers copied a few key words from the textbook onto the chalkboard for pupils to copy into their exercise books. In a few lessons, students used improvised materials (pp.6-7).

When textbooks are used by students, their use varies among classrooms in a school and between schools: in most classrooms, when teachers use the books, they have students read silently, look at pictures, or copy exercises; in one school, all books but the teachers' were kept in the headmaster's office; in another, the books are in the classrooms, but used infrequently. Among the 6 schools, in only one classroom did the teacher distribute the books for independent reading; she gave out reading books to some students who had completed their math assignments. The students opened their books to the assigned pages, but appeared to lose interest soon. In one sixth grade class, the teacher encouraged students to make use of their books during reading and comprehension lessons and allowed them to take the books home in the evenings.

One of the individual school reports tells us that

Textbooks were not used by either teachers or pupils in most of the lessons observed. Sometimes the teachers brought them to the classrooms but kept them on their tables; they copied material from the textbook onto the board for pupils to recite. The question that would intrigue any observer is, why did the teachers avoid using the textbooks? We put this question to them and their response was that there were not enough textbooks so the pupils would struggle for the few available. They wanted to avoid this occurrence. When it was suggested to them that they could distribute most of the books one-to-two pupils, the teachers did not challenge the suggestion but gave another

reason. They complained the pupils could not read the books so they had to copy on the board for them to read (p. 18).

This research brings us closer to understanding teachers' rationales for their use of textbooks. It also suggests some limitations of teachers and textbooks, which, at least in Ghana, need further exploration.

Though these three studies that employ classroom observation as a research method are not the only ones of their kind on schools in developing countries, such studies are rare and not readily available. They question assumptions made about the connections between availability and use of materials. They also raise important questions for research in all countries, including South Africa:

- To what extent do teachers actually use textbooks and other materials available to them?
- How do they use them, and how does use vary among teachers?
- What effects does their use have on student learning?

As we shall see, only two of these three questions have been addressed through empirical research, even in the United States.⁴

⁴ The IEQ staff is finding that, in South Africa, teachers' limited use of textbooks varies considerably, depending on teacher knowledge, experience, and the availability of other resources in the classroom.

RESEARCH IN THE UNITED STATES

We turn now to the literature on how teachers in the United States use textbooks and other print materials in the classroom. We are limiting our inquiry to research on materials in elementary schools. Almost always, the research is on textbooks and supplemental materials provided by the textbooks publisher. Only occasionally does it include print materials produced locally.

We have summarized the research according to these six questions:

- How pervasive is the use of textbooks?
- What accounts for teachers' extensive use of textbooks?
- How do teachers use textbooks to plan and make decisions about instruction?
- How do they use textbooks during the teaching-learning process?
- What use do they make of teacher's guides?
- What do they learn about textbooks during their pre-service training?

The literature on textbook use is scattered among the research on other topics, such as that on how teachers make decisions, and how teachers teach reading, math, and science. Even though Cronbach (1955) pleaded four decades ago for more research on textbook use in the classroom, this has never been a topic of keen interest. Yet, as we will see, it deserves more attention, if only because the studies that we review here challenge some assumptions about the role of textbooks and other print materials in U.S. classrooms.

How pervasive is the use of textbooks?

We searched for nationwide studies of materials availability and use in the United States somewhat comparable to those done in some of the developing countries. The large-scale survey cited most often was conducted by the Educational Products Information Exchange Institute (EPIE) in 1977. The researchers selected a representative sample of principals and teachers across the country, and mailed them a questionnaire concerning their use of textbooks and other materials in the classroom. From a sample of about 12,000 teachers, the researchers learned that

- An average of 62.5 percent of class time is structured around print materials, with little variation across school districts.

- Fifty-one percent of teachers received some training in the use of the materials they use; 25 percent from publishers representatives, 15 percent from a school district consultant, and 14 percent from some "other" source.
- Few use commercially available supplementary sources, though 30 percent use "locally developed materials" such as worksheets and tests.

The researchers confirmed the data taken from the written survey with visits to two full-class meetings in 150 classrooms at 56 schools across the country.

Woodward and Elliott (1990) in an essay on the lamentable reliance of many teachers on teachers' guides, summarize other research findings in addition to the EPIE report that "textbooks are ubiquitous and widely used in classrooms."

- In a survey of 1,580 elementary school teachers and 141 elementary school principals, Barton and Wilder (1966) found that 98 percent of first-grade teachers and 92 to 94 percent of second- and third-grade teachers used basal readers on "all or most of the days of the year."
- Turner's (1988) survey of 339 teachers found that 85 percent of them used basal readers, and that 56 percent of districts represented by the teacher sample required basals to be followed strictly.
- Weiss (1987) found that 90 percent of science and math classes at each grade used textbooks.

What accounts for teachers' extensive use of textbooks?

Woodward and Elliott also looked at studies that consider particular variables that might account for the range of dependence among teachers on textbooks and accompanying guides:

- Experience in teaching
- Subject matter expertise
- Amount of time allocated to certain subjects and the nature of the instructional materials.

Other variables they suggest (without support of empirical research) are: teachers' and administrators beliefs that textbooks hold content expertise and authority; expectations by parents; cultural support for their use; seemingly high-quality design; apparent congruence with local curricula. Characterizing the teachers who rely heavily on textbooks, the authors conclude that their role becomes "that of an administrator of a preplanned lesson."

We cite the Woodward and Elliott article because it draws a sharp contrast between what researchers observed in Botswana and Ghana about teachers' very limited use of textbooks in the classroom and the evidence that teachers in the United States, by and large, make extensive use of textbooks. The article does not, however, present its own empirical study.

McCutcheon (1982) studied a single school in central Ohio, in which she observed several teachers over half a year. Her tentative findings included a list of "factors that seem to account for teachers' widespread, extensive use of textbooks":

- Beliefs that because the school board ordered the texts they must be used
- Peer pressure
- Parent pressure for homework and bringing books home every weekend
- Written courses of study required locally by the state
- Beliefs about what school should be like
- Ease of use, clear organization
- Responsibility to plan and teach seven to eight subjects, sometimes with three ability groups, yet rich understanding of fewer subjects and little planning time
- A lack of many other materials
- Beliefs about the need for uniformity and continuity
- Previous education courses.

How do teachers use textbooks in planning and making decisions about instruction?

We found five studies in which the researchers' primary interest was in how teachers use textbooks to plan and make decisions about instruction. Three of these are separate reports on a large study of what influences teachers' decisions on what to teach in mathematics.

In 1989, Freeman and Porter re-examined data they had collected in 1979 to take a closer look at teachers' decisions about what content of the textbook to teach. Their main concern in this study was:

- To what extent do teachers rely on the textbook to dictate what they teach and how?

They noted that textbooks have limits in how they can direct teachers' activities. Textbooks "are largely silent" on how much time to devote to a subject matter over the course of the year, how to vary content for different students, and what standards of achievement to hold. On the other hand, textbooks do provide guidance for other content decisions: what topics to cover, how much time to allocate to each topic, and in what sequence.

In order to learn more about how textbooks influence teachers' decisions in these last three areas, the researchers studied styles of textbook use.⁵ As part of a comprehensive series of studies of how teachers decide what to teach, they conducted year-long case studies of seven elementary-school teachers. These teachers demonstrated three distinct styles of textbook use:

- The "textbook bound" teacher begins the school year with the lesson on page one and progresses page by page through the book over the course of the year. In order to get through the book, some omit selected chapters.
- The "basics" teacher focuses on chapters that review addition, subtraction, multiplication, and division, and introduce fractions.

⁵ They also studied the match between content presented in textbooks and content covered in instruction. Because this question has more to do with selection and organization of material than with their use of textbooks in the process of instruction, we will limit our coverage to the first question.

- The "management by objectives" teacher works in a school district that requires teachers to use an MBO system in teaching math in order to insure that all students require minimal competencies. As an aid to teachers, the district provides a list that coordinates textbook exercises with each instructional objective.

Freeman and Porter looked for differences between among the three styles of teachers in (a) the relative strength of his or her view of the textbook as a content authority, and (b) his or her own content convictions, for example, the need to master basics. They found that both the "textbook bound" and the "focus on objectives" teachers viewed the book as high in authority (the others viewed it as low or moderate), and that the "focus on the basics" teachers had high strength of convictions (the "textbook bound" was moderate, and the "focus on objectives" was low).

They found differences in the amounts of time teachers allocated to concepts, skills, and applications, their grouping practices, and their standards of achievement. They also saw differences in the degree to which teachers presented the content of the textbook around each topic. The "textbook bound" teacher "not only taught a higher proportion of lessons, she also was more likely to present these lessons in a style that conformed to the textbook....The 'basics' teachers were more selective in deciding which sections of each lesson to use, and the 'objectives' teacher used selected sections suggested by the school district."

They conclude with two implications of their findings:

- First, "textbooks are not the content control policy instruments they are billed to be. Rather, teachers' content decision making is a function of several other factors, including student aptitude, limits in instructional time, and teachers' own convictions."
- Second, "we question whether students are typically better served by teachers who go beyond their textbooks than by those who follow their books closely. In this study, the teachers who followed their textbooks most closely were the teachers who placed the most emphasis on applications and conceptual understanding. The teachers who deviated most from their textbooks did so to augment an already heavy emphasis on drill and practice of computational skills" (p. 419).

In an earlier report, Freeman, Belli, Porter, Floden, Schmidt, and Schwillie (1983) examined their data to answer the question:

- To what degree does the match in textbook-test content vary as a function of how a teacher uses the book?

The researchers had been studying the match between the content of material presented in fourth-grade mathematics textbooks and the content of items on standardized tests for that grade level. Their general interest was in whether all students across the country had the same "opportunity to learn" (or exposure to the curriculum--in this case defined as what is covered by the aggregate of nationally used fourth-grade standardized tests) based on the content of their textbook.

In their research, they conducted intensive year-long case studies of seven classrooms in three Michigan school districts, two rural and one urban, selected for differences in type and strength of district policies that could influence content decisions in mathematics.⁶ To collect data, they asked teachers to keep detailed daily logs of what they taught, including their use of textbooks and other materials, and how they allocated time within math lessons. Researchers collected these logs each week, at which time they interviewed the teachers, including asking questions to clarify any ambiguities in their descriptions of what they taught.

In this study, the three distinctive styles of teachers using textbooks was expanded somewhat. The "textbook bound" teacher style was broken into two groups: those who omit nothing (except what they fail to reach at the end of the book) and those who selectively omit sections. Likewise, the "basics" teachers were subdivided into those who include a unit on measurement and those who do not.

Applying these five styles to a single textbook (*Holt School Mathematics*), the researchers used data collected from classroom observations to determine what portion of the textbook content each style of teaching covered and the match between that portion and each of five standardized tests. They also determined what proportion of time each style of teaching devoted to each unit of content. For example, they found that teachers who used the MBO style spent a considerably greater proportion of time on each of the units they taught, but they did not cover nearly as many units as did the other four teaching styles.

The researchers found that "instructional validity" (or the match between what was taught and what was tested) does vary among teacher styles using the same textbook. While it is not relevant to our interests to elaborate on these findings, we do gain some useful information from this study. First, we see that researchers were able to

⁶ The information about the sample comes from Freeman and Porter, 1989.

distinguish between different styles of textbook use and to develop quantitative measures that correlate these styles to students' opportunity to learn. Second, we find that, in the cases examined here,⁷ different styles of textbook use do affect student achievement on some (though not all) standardized tests.

This study does not tell us anything more about how teachers use textbooks in the classroom than that they cover chapters selectively and that some teachers spend more time on some chapters than do others.

Alvermann (1987) also conducted a study within the research on how teachers make decisions about instruction. She distinguished between reactive decisions (in planning lessons) and interactive decisions (during the teaching-learning process). The particular question of this study is:

- How does the textbook figure into decisions about adjusting their pre-planned follow-up discussions of content area textbook assignments?⁸

The data come from a broader descriptive study that included a "descriptive analysis of the socio-communicative patterns" identified during the videotaped discussion in 24 teachers' classrooms.

The subjects of the study were teachers in grades six through eight in the subjects of social studies, science, literature and language, health and human development, and remedial reading. The ability groupings of students included "gifted," "regular," and "multiple disabled." The teachers and students "represented a mix of socio-economic levels within rural, suburban, and urban settings of four county school districts located in northeast and south central Georgia." The teachers were mostly female (14) and white (14), but also included males and blacks.

This study is interesting as much for the elaborate qualitative methodology used as for the findings. Thus, we will focus on data collection and analysis methods. The teachers volunteered to participate extensively in the preparations for data collection and in its analysis. They agreed with the researchers on a time that they would

⁷ The authors point out that due to the limitations on their sample and on their arbitrary standards for describing the content of instruction, the data should be viewed as illustrative, not definitive.

⁸ Content area textbooks are those that cover specific subjects such as science, reading, social studies, in contrast to basic readers.

present a lesson for which the students would be ready to discuss what they had read from previously assigned content area texts. The researchers set up video and audio tape equipment in the classroom the day before the lesson, and then taped the lesson the next day at the scheduled time.

After all participating teachers at a site had been videotaped, the investigatormet individually with approximately one-third of the teachers for the purpose of jointly viewing the videotapes and collecting data in the form of stimulated recall protocols. The investigator held informal interviews with the remaining two-thirds of the teachers (pp. 117-118).

In analyzing data collected on videotape, the researchers took pains to maximize reliability and external validity. They coded categories and properties of the discussions by allowing patterns of textbook use in interactive decision making to emerge through the "constant comparative" methodology of Glaser and Strauss (1967) rather than by pre-selecting categories of phenomena. They also adhered to the design features of Goetz and LeCompte (1984): "low-inference descriptors," including field notes and transcriptions of the videotaped data, and "multiple researchers and participant informants," including the participation of teachers in stimulated recall sessions and informal interviews. Finally, in their report, the researcher provided direct quotations from exchanges with teachers, both in class, and in recall sessions, which add to the meaning of their quantified data.

Alvermann and her colleagues found four ways in which teachers used textbooks during the discussion to make decisions about how to manage the lesson:

- By far the greatest use by most teachers was to refocus discussion--to come back to the text that was the subject of the lesson when students strayed from it. "Perhaps their propensity for using it to refocus a discussion was an indication of their students' inability to sustain a line of verbal inquiry." In some instances, "the textbook appeared to be acting as a mediating agent that helped teachers deal successfully with unacceptable student behavior."
- Only the teacher of "gifted students" in literature and social studies used the textbook to verify points of disagreement.
- A few teachers of "regular" students used it to refer indirectly to previously read text, and, except in one case, not very often.

- One science teacher used the text to prompt answers. Students in this class "were conditioned to waiting for the teacher's numerous textbook prompts. They knew he had one and only one answer in mind and that the answer could be found verbatim in the text. As a result, they rarely ventured forth with their own complete answers, preferring instead to let the teacher drag the answers from them."

While the descriptive findings of this study about various ways in which teachers use the textbook in discussion are key to our interest, we wonder about their interpretation. Why are their behaviors considered as "decision making" rather than simply management of discussion? Also, it seems that the wide variety of content areas and of student groupings (gifted, learning disabled, regular) hampered the ability to find meaningful patterns of textbook use. Nonetheless, the study has value for us by virtue of its research methodology and its categorical descriptions of teachers' textbook use.

Finally, McCutcheon (1981), studied how 12 teachers in three school systems in Virginia (one city, one smaller city, and one rural) planned lessons over the course of the year. She found that while most teachers (85 to 95 percent) rely on textbooks as the major source of planning activities in math and reading, decisions about social studies and science stem from other factors. This is largely because teachers have relatively less time to teach those two subjects and cannot rely on a comprehensive curriculum presented in a textbook.

She also concluded that teachers do little long-range planning because they believe the textbook does this for them "by selecting and sequencing topics and concepts."

How do teachers use textbooks during the course of instruction?

We found two studies that not only looked at how teachers actually used the book during the process of instruction, but also considered the teachers' thinking and rationale behind their use of those books.

Stodolsky and her colleagues (1989) examined the assumption that "textbooks drive instruction because they are ubiquitous." They looked closely at how fifth-grade teachers use textbooks in math and social studies, and how their uses differ between these two subjects. They collected their data in Chicago schools serving lower-class, working-class, middle-class, and upper-middle class pupils. The nine teachers they

observed had between six and thirty-six years of experience. They were observed during two consecutive weeks of instruction in mid-year.

The researchers asked questions about three aspects of use:

- To what extent did teachers cover topics presented in the textbooks?
- What sections of the book and/or supplementary materials were used?
- To what extent were suggestions in the teachers' editions followed?

In mathematics, at the level of topic, they found, as did Freeman, et al., that teachers covered only the topics in the books, though not necessarily all of those topics nor in the order presented. At the level of content, their findings go deeper than those of Freeman, et al. Stodolsky categorized the contents of the textbooks and examined how teachers used each category: introductory or developmental, exercises, maintenance, review and tests, and enrichment. They constructed a table, showing each of these categories on one axis, each of the six teachers on the other axis, and indicating in each cell whether the teacher used the content and, if notable, how.

To summarize generally, they found wide variation in the extent to which teachers used each of these sections, though the introductory and exercise sections got more use than the maintenance, review, test, and enrichment sections, which hardly got any use. Teachers do not seem to consider the suggestions in the teachers' editions when they plan or present their lessons.

In summarizing their findings in math teaching, the researchers reported that

Our cases suggest that teachers are very autonomous in their textbook use and that it is likely that only a minority of teachers really follow the text in the page-by-page manner suggested in the literature. Use is much more varied than usually suggested, particularly when one considers more than just the topics contained in the books....

Developers of teacher's editions might be sobered by our findings that suggest a weak link between their suggestions and actual classroom practices. However, it should be noted that we studied highly experienced teachers (p. 176).

In social studies, Stodolsky and colleagues focused first on the topics taught in class and their match with the textbook and supplementary materials. They found that, in contrast to math texts, social studies texts "do not define the maximum range of

topics covered during instruction." Teachers frequently bring in topics not covered by the textbook, related or unrelated to its curriculum content. Again, they found variation among teachers, half adhering rather closely to the curriculum of the textbook and the other half deviating widely from it.

Interestingly, in terms of what sections of the book were used, the two teachers that stuck most closely to the content of the book were in schools using innovative curricula that included small group work and other less traditional activities. Teachers using standard textbooks and curricula drew more on multiple sources of materials--workbooks, other texts, newspapers, and films--drawing from other publishers than those of the textbooks.

In the use of social studies textbooks, the researchers observed that "as in math, enrichment suggestions in teachers' guides were ignored rather consistently as were most instructional suggestions. Our teachers used texts in the styles they felt most appropriate for themselves and their students, consistent with general school policies" (p. 180).

Stodolsky concludes with the suggestion that

the common wisdom about textbooks pervading instructional decisions and actions must be tempered with more deliberate analysis of the specific ways in which such an assertion is valid and the conditions under which it is true. The popular vision of slavish adherence to texts does not seem supportable and may have arisen in part from overgeneralization of knowledge about primary reading instruction. The faulty assertions have also been bolstered by a lack of direct observation or other systematic data with which to verify or refute them (p. 181).

Sosniak and Stodolsky (1993) pursued Stodolsky's earlier research on how teachers actually use textbooks in the classroom. This study is by far the most exciting in terms of our interests, their methodology, and--it follows--their findings. The researchers begin by pointing out that "systematic attention to textbooks and their use by teachers and students is long overdue" and "their role in education frequently has been either overlooked or assumed." Although others have addressed textbook use, they have not considered "how teachers view textbooks within the framework of their instructional plans and actions, both within and across specific subjects."

Sosniak and Stodolsky first posed a question they could answer by observation:

- How often and in what ways do teachers use textbooks and other materials in the course of teaching language arts (reading), mathematics, and social studies, and how consistent is textbook use within and across these subjects?

They then go beyond this descriptive information and ask:

- What do teachers *think* about textbooks and their use within and across subjects, how do their thoughts relate to instruction, and how consistent is teachers' thinking about textbooks?⁹

The researchers carried out their investigation in four 4th-grade classrooms in the Chicago school district: they studied two pairs of teachers in two different schools. One was a neighborhood school in a mixed-ethnic neighborhood. The children came from low-income families; many were Hispanic. The other was a magnet school in a neighborhood with a changing population and upgrading in housing; the children were balanced across racial and ethnic lines. The school had a "history of student achievement well above national norms."

They collected data over the course of a year, including two week-long visits to each class, from Monday morning through Friday afternoon; one visit was in fall and the other in spring. During these visits they kept narrative records (Wright, H. F., 1967). Using an informal interview guide (Patton, M. Q., 1990), they also conducted three semi-structured and tape-recorded interviews with teachers. Each interview lasted about an hour. They analyzed the observation data and transcribed tape recordings separately, using the "constant comparative method" (Glaser, B.G., 1965).

Sosniak and Stodolsky present their findings in a richly detailed description of each teachers' practices and how they differ. They summarize their observations about use as follows:

Use of textbooks in their designated sequence was, typically, a teacher pattern, largely independent of the materials themselves, the subject, or the culture of the school. For example [two teachers] used most of their textbook materials in the sequence designed

⁹ The researchers have a third question, which we will not consider here:
How do teachers' views about textbooks and other materials fit in the larger body of influences (e.g., testing programs, district guidelines for curriculum and instruction) teachers may consider in planning instruction?

by the publishers. In contrast, [the other two] typically chose sections from the various books without apparent concern for textbook-designed sequence (p. 259).

They also found that:

None of the four teachers used textbook materials in the same manner across subjects (considering, e.g., how much instructional time was spent with textbook materials, how the materials were used, which aspects of the materials were used, and how much and what sorts of materials were used in addition to the text). Instead, the teachers worked with materials and subjects in distinctive ways (p. 255).

While these observations are enlightening, even more revealing is teachers' explanations of their uses of textbooks and other materials. "Observations are easily amenable to misinterpretation." While two teachers may be observed to use the textbook in a similar way, or while one teacher may seem to use textbooks in the same way across subjects, their thoughts about why they behave in these ways may differ dramatically, from teacher to teacher and subject to subject. In contrast, teachers who appear to use materials differently may not be very different in the thinking that underlies their behavior.

In asking teachers their views of textbook materials, the researchers learned that textbooks do not necessarily play the dominating role that is often assumed. The teachers saw themselves as teaching knowledge and skills to a group of children, not teaching a book or a specific set of materials.

Textbooks apparently were something akin to props these teachers used in putting on the play of fourth-grade education. The materials were essential to the action but did not demand or receive focused attention or analysis in most instances (p. 266).

Because the subjects of this research were limited to four teachers in a single school district in the cultural context of the city of Chicago, the particular findings of teachers' use of materials, their particular patterns of behavior cannot be generalized. But that there is great variation among teachers' use of materials, and that teachers' own explanations of their behavior often confound what can be observed, highlights the importance about examining how *and why* teachers use materials in other specific contexts.

The researchers conclude the report of their study with a practical implication:

Our research suggests that helping teachers become more aware of their patterns of materials use, their own selectivity, the alternatives available to them, and the consequences of the choices they make for instructional activities is an important avenue to pursue (pp. 272-273).

To what extent do teachers use teacher's guides?

Two studies look at the extent to which teachers use teacher's guides. Both of these are concerned with basal readers.¹⁰ Barr and Sadow (1989) zero in at a close range on reading teachers' use of basal programs. One value of this study for us is its delineation of questions about precisely how teachers vary in their use of specific textbooks, including the accompanying teacher's guide. The researchers ask three questions¹¹:

- To what extent are the materials available in basal programs actually assigned to and read by students, and how does the design of the program influence this selection?
- How does the balance of skill practice and contextual reading in a basal program influence the use of time during instruction?
- To what extent are the recommendations in the teacher's guide followed by teachers during pre-reading and post-reading activities?

As part of a larger study, the researchers studied seven 4th-grade classrooms. These classes were in four schools in two districts in Chicago. One school was in a very poor area, one in a lower- middle class area, and two in an affluent, all-white suburb. The researchers did not "detect a monopoly on teacher competence" in either district.

Their methods of data collection on how teachers actually used materials included observing and audiotaping each class eight times during the school year. They used a coding form to measure how time was spent on a range of instructional activities, categorized as word identification, word meaning, and comprehension. They used

¹⁰ Though we did not find any studies of how teachers use guides to content area textbooks, this is touched on in the next section.

¹¹ They also ask about the basal programs themselves--how they are organized and what kinds of materials are included. But for our purpose, these questions are only preliminary.

audiotapes to determine the nature and source of teachers' questions about the reading selections. They interviewed teachers during the summer preceding the observation to collect information on their background, plans, and expectations. And they interviewed them after each observation to collect information on the coherence of observed activities and teachers' daily logs, which they used to extrapolate observation data to year-long practices.

In effect, the basal program used by these teachers constituted their entire curriculum in reading. They did not give any lessons in reading that used other materials or that did not use any materials. The decisions they made about the curriculum cum textbook, were, first, what to omit--if anything--and, second, what sequence to follow.

The two basal programs differed notably in that one separated fiction and nonfiction selections into two volumes and did not provide supplemental guides for teachers on the fiction volume. These were to be read by students "with a minimum of pre-reading guidance and without the distraction of skill lessons and post-reading exercises....The publishers argue that intermediate-grade students primarily need instruction in the specialized skills of content-area reading." The researchers found that teachers using this basal program made little use of the fiction selections. Those using the other, more traditional program, in which fiction and nonfiction were mixed in the same volume and both included guidance for teachers, were more comprehensive in their use of the selections.

The researchers found variation among teachers using the same programs in how they used the materials. And they found considerable differences between all four in their use of the materials. For example:

- Their use of selected readings ranged from 26 percent to 99 percent.
- Their use of skill practice materials provided ranged from 35 percent to 100 percent.
- Their use of post-reading questions suggested by the teacher's guide ranged from zero to 98 percent, and the percent of questions asked that they generated themselves ranged from 10 to 75.

Perhaps their most interesting finding is that, as evident from their use of materials, teachers vary in their use of the teacher's guide. The guide suggests a pattern to follow in each reading lesson, including what to do before assigning the reading

selection and afterward. Few teachers take the time to do all the activities suggested. This research

suggests that teachers develop routines to solve the problem of what to select from the teacher's guide. They do not seem to make a new decision in response to the demands of each selection; rather they appear to rely on generic solutions as efficient means for dealing with a complex set of materials (p. 68).

Barr and Sadow elaborate on the implications of this focused study for teacher training. They state that "basal programs form the backbone of instruction in most schools; yet they are simply tools, which can--if used mindlessly or unwisely--result in ineffective instruction." Thus, teachers need to be taught to judge which reading materials have the most value for their students, which teacher's guide selections are most appropriate for them, and how to generate their own, more appropriate questions for students. In other words, when a package of textbook materials permits teachers to pick and choose, teachers need training in how to do so.

Durkin (1984) asked a similar but more limited set of questions:

- Is there any pattern in, or conscious reason for, what teachers use, skip, or alter from among the many suggestions in basal reader manuals?
- Are there differences in the way manuals function at different grade levels?
- Why do teachers use or not use manual recommendations?

She observed 16 teachers in grades one, three, and five on two successive days during their scheduled reading periods.¹² She recorded for 10 responses to activities suggested by the guide whether teachers did these activities, and whether they altered their form or sequence. She also interviewed teachers after each observation to confirm the accuracy of her observation records and to get some explanation of their uses of the guide's suggestions. She accepted their explanations at face value and rarely probed for more information.

Durkin found that most teachers used some suggestions generously (primarily those for assessment questions and written practice assignments), but others had only minor influence (background information, vocabulary, and pre-reading questions).

¹² The report does not tell us anything about the schools, teachers, or students, though they were probably near the University of Illinois in Champaign.

Across the three grade levels, there was much similarity in how teachers used the manuals.

What is most interesting, however, is her conclusions about *why* teachers spend so much time on oral reading and written exercises and so little on background information, vocabulary, and pre-reading questions.

It could certainly be conjectured that oral reading at all three grade levels was as much a device for controlling students as for teaching them. The same motive applies to the time given to practice assignments, where all the teachers said that one goal was to keep students occupied (p. 745).

We find this conclusion interesting for two reasons. First, the researcher's shortage of interview data forces her to make interpretations about her observations that may or may not be valid. Second, if they are valid, they point to the possibility that extensive use of materials can actually be an abuse of them. Analyses of precisely how teachers use materials are enhanced by indicators of how they affect instruction. In other words, as Sosniak and Sodolsky observed, research studies should be designed to tell us something about why teachers do what they do.

What do teachers learn about textbooks in their pre-service training?

Ball and Feiman-Nemser (1988) conducted research on student teachers to find out what they learned about textbooks in their pre-service training. This study, though at first glance slightly tangential to our focus, sheds bright light on how teachers use textbooks. It does so by describing what teachers are taught in teacher-training programs about textbooks and how this knowledge affects their earliest experiences in the classroom.

The researchers asked three questions about the student teachers they studied:

- What did their teacher education programs convey about textbooks, planning, and curricular decision making?
- What did the prospective teachers come to believe about the use of textbooks, planning and curricular decision making?
- What did they do with textbooks and teachers' guides during student teaching?

The data came from a longitudinal study of six elementary education students through two different two-year undergraduate teacher education programs. (The programs were probably near Michigan State University in East Lansing.) Teachers were selected to be generally representative of students in those programs. They were all women; two were returning to school after having a family; one was black. Two had strong academic records, three appeared average, and one had a weaker record. Data was collected through observing the student teachers in their college courses and later in their practice-teaching situations, both in the classroom and in conversations with cooperating teachers and university supervisors. The researchers also interviewed the student teachers four times during their coursework as well as during their practice teaching,¹³ and they studied their papers and other assignments. They tape recorded and transcribed the interviews and analyzed the data in terms of a series of questions about the student teachers and textbooks, curricular decision-making, planning, and practical experience.

Ball and Feimar-Nemser found that students in both programs were taught that "good teachers don't follow textbooks." In one program, this was emphasized from a "learning" point of view: good teachers focus on students' thinking, and at best textbooks can only be used as a limited resource. In the other program, it came from a "teaching" point of view: good teachers rely on their own professional knowledge of subject matter and students to develop instructional programs, not on other individuals, including textbook authors. "Abandoning their common sense notions about textbooks, teacher candidates in both programs came to see textbooks in terms of their programs' ideology." They learned that "their personal ideas and knowledge were a better source of content than anything in the textbook or teacher's guide."

During their student teaching, however, most of the students were placed in classrooms where they had to use textbooks to teach reading, math, science, and social studies. And they were unprepared to do so. Some of them did not have a good enough understanding of the subject matter to make sense of the teacher's guide. The authors cite one student teacher who had trouble following suggestions for a lesson on representing length that included having the children make paper chains to measure themselves. Another was troubled by place value, and, in social studies, another had difficulty teaching the meaning of "culture." The researchers observed about the first:

¹³ The researchers comment that they regret not having interviewed the instructors of education courses as well. Neither did they interview the "cooperating" teachers in whose classrooms they practiced; these data might also have been instructive.

[Her] problems in understanding the teaching suggestions in the guide stemmed from insufficient knowledge about math, pedagogy, and children, not surprising for a beginner. A more experienced teacher, who understood measurement as a mathematical topic, who knew something about how kindergartners make sense of it, and who could visualize ways of orchestrating such activities, would probably not find the teaching suggestions mysterious or underdeveloped (p. 416).

The implications of these findings are that, while textbooks are widely criticized for their content, biases, and implicit views of teaching and learning, most novice teachers are required to use them. Moreover, these new teachers lack the subject knowledge, knowledge about children, and pedagogical skills to rely on their own resources. The authors suggest that in college courses, prospective teachers be taught to use textbooks and teacher's guides, and that these be considered as "instructional scaffolding" (to use the constructivists' term). New teachers can use the support of textbooks and guides where their own subject knowledge is weak and until they know what to expect from children and develop their own pedagogical skills.

This article says a lot about teachers' ability, and lack thereof, to use textbooks. While other studies appear to assume that teachers are skilled enough to use textbooks and teacher's guides in whatever manner they choose, this one makes it apparent that many teachers, especially beginners, lack the ability to make choices about textbook use and need help in learning how to use them effectively as a reliable support.

Textbook use and student achievement

We came across only two discussions of how variations in textbook use affect student achievement. One of these was in a footnote. Barrow and Sadow (1989) tested for student achievement using Degrees of Reading Power test (1979), New York: College Entrance Examinations Board. Among the seven teachers they studied using two different basal programs, they found no significant differences in student achievement. The other was in Freeman, et al. (1983), whose purpose was not to measure effects on achievement *per se*, but to correlate patterns of use with scores on a variety of standardized tests. Thus, they drew no conclusions about student achievement.

Teachers' use of textbooks does not appear to be included in process/product research, which examines variables in teacher behavior to determine which have positive effects on student achievement. Brophy and Good (1986) reviewed the

literature on empirical research on teacher behaviors and student achievement. Their categories of research do not include anything close to textbook use.

Most researchers we reviewed were, in fact, cautious about making judgements on the effectiveness of teachers' patterns of use. They preferred to remain descriptive. Sometimes their judgements were apparent, as when they discussed patterns in terms of "teacher-centered" and "learner-centered" instruction. But even at those times, they hesitate to draw judgmental conclusions. Stodolsky points out that one cannot make easy judgements about correct and incorrect ways to use a textbook.

Teaching by the book has often been taken as synonymous with teacher-centered lessons. There has been a facile and unwarranted equating of teacher-directed instructional techniques with textbook-driven instruction. Particularly in subjects other than the basics, a variety of instructional arrangements are called for in various curricular programs. An image of teacher-led lessons, frequent recitations, and seatwork is invoked to describe the textbook-driven classroom. But all books do not call for these arrangements. The existence of a teacher-centered program does not necessarily mean that the textbook is being followed. Conversely, the creation of a student-centered environment does not necessarily signal departure from a textbook program. Some books and curricula require establishment of peer work groups, games, laboratory exercises, or computer-aided instruction (p. 160).

For the most part, the research in the United States on teachers' use of materials is ethnographic, attempting to relate the use of textbooks to other aspects of the teaching-learning process, and not aimed at demonstrating correlations between patterns of use and student achievement.

Summary

From our review of the literature on how teachers in the United States use textbooks and other print materials we have generated a list of research questions about teachers' use of materials¹⁴:

- How do teachers use textbooks, guides and other materials?

¹⁴ Many of these questions come from McCutcheon (1982).

-What parts of texts, guides and supplementary materials do teachers use and delete? What do they emphasize in texts, and what do they cover in less depth?

-In what ways do teachers use the texts? Do they distribute them to students and use them in class? What do students do with them?

-Do teachers follow the order presented in the textbook? Why or why not? Do they supplement textbooks with other materials?

- What reasons do teachers give for these decisions? How is the nature of the content changed or adhered to when activities are altered? In what ways do teachers change the intent of authors of texts?
- What options do teachers perceive they have? In what ways do they supplement the textbook or replace it? What do they report are their reasons for these decisions?
- Do teachers use textbooks differently according to different subject areas? If so, in what ways, and why?
- How does their use relate to teachers' views of how children learn and their own roles in children's learning?
- What psychological value do teachers see in reliance on textbooks (for instance, the need for certainty about what to teach)?
- What other factors influence their use (e.g., training, comfort with the book, subject matter knowledge, knowledge about children, pedagogical skill, preference for other resources, and so on)?
- What are the apparent influences of the textbook and its use on the curriculum (i.e., on what children have the opportunity to learn)?

-What is the nature of the curriculum emerging from the use of textbook materials?

-In what ways do parts of the curriculum conflict or support one another due to the textbook materials (e.g., do they conflict in their

assumptions about how children learn or about the teacher's role in children's learning)?

- What are the effects of different kinds of use (in-class assignments, reading aloud, use in homework, and so on) on student performance?

We have also described a number of different research methods used to study how teachers use textbooks. In contrast to research methods used in developing countries, which are predominantly large-scale surveys based on written questionnaires, we find that classroom observations are used frequently in the United States. These vary in how long and how frequent the observations are. Most of them entail audio- or videotaping of classes in action. Researchers also use interviews to supplement their observations, and we have seen that these result in data that provides rich information about why teachers behave as they do--information that cannot be derived from observations alone.

We have seen some consistency in findings across these studies:

- Teachers seem to develop their own patterns of using materials, which they keep from year to year and textbook to textbook.
- Teachers vary among themselves in what these patterns look like and why they adopt them.
- While politicians and others outside the classroom tend to think textbooks dominate the classroom, teachers often view them as only one of several tools. Some use them effectively; others may misuse them.
- It is difficult to find out how teachers use textbooks without actually observing them do so. Likewise, it is difficult to find out what they think about their use without actually asking them.

Finally, we have looked at studies that take place in a variety of contexts, including rural and urban schools, and those with experienced and inexperienced teachers. But the context of the classroom in the United States, is, in most cases, significantly different from that of the classrooms in other parts of the world. And how teachers in the United States use textbooks and other materials is a function of many factors.

To study teachers' use of textbooks one should not merely examine teachers' classroom practices. Rather, comparisons must be made of their practices with the requirements,

recommendations, and content of their textbooks. The particular nature of the textbook or curriculum package must be considered more systematically in determining its impact on instructional processes (Stodolsky, p. 160).

Thus, many of the findings and issues reported on here may not pertain to other contexts. What, then, is the relevance of our review to potential research in South Africa?

CONCLUSIONS

Comparing what we have learned about how teachers in the United States use materials with how those in developing countries use them, it appears that the former may "over use" textbooks, in the sense that many use them almost exclusively as the curriculum and source of all instructional materials. Teachers in Botswana, Ghana, and Chile, in contrast, appear to "under use" them; they do not use materials during large portions of the lessons. Yet, we have also learned that, when probed, teachers in the United States may have well conceived reasons for their use of materials, and that observation alone of the extent to which textbooks are used does not necessarily tell us anything about the quality of the instruction.

While educators and politicians in the United States continue to have broad disagreements among themselves on the merits of national-level policies and standards that affect individual school districts', schools', and even teachers' freedom to design and implement classroom instruction, South Africa has had a tight network of control over what gets taught. Specific state-sanctioned textbooks are written to directly address the syllabus topics; examinations are given by the state to ensure compliance with the syllabus, and, by extension, textbooks.

- This leads to our *first observation* about planning research in South Africa. We would expect that even in a situation where the use of textbooks is much more controlled and therefore presents fewer differences in use among teachers, different teachers use textbooks differently, and one teacher uses different subject-matter textbooks differently. We must know *why* teachers behave as they do, in terms of their own thinking about instruction.

Research shows that teachers' practices vary considerably. We learned that new teachers in the United States have different needs for the textbook than do experienced teachers. The researchers in Chile found that experienced teachers use textbooks more often than do their novice colleagues. Other research, such as Durkin's, suggests that even experienced teachers whose subject-matter knowledge is inadequate and/or pedagogical skills not developed use textbooks in a manner different from competent colleagues.

- Our *second observation* is that research in South Africa should describe the differences in use of materials among teachers with more or less experience, education, competence, and other such variables. It should also try to account for why differences may exist along such lines.

Though we came across only a few studies of how teachers are supported in their use of textbooks (teacher's guides and pre-service training), these studies enlightened us both on how teachers use textbooks and why.

- Our *third observation* is that researchers in South Africa should consider studying teacher training programs and other forms of teacher support to see what, if any, guidance they provide in using textbooks.

Textbooks and other print materials are expensive resources used far from optimally in industrialized as well as developing countries. Research in South Africa on how teachers use materials is warranted as a means to improving teacher training and teacher support, as well as the materials themselves. Teachers who can make the best use of materials will contribute considerably to improving the quality of education.

BIBLIOGRAPHY

Research in developing countries

Altbach, Philip G. and Gail P. Kelly (1988). *Textbooks in the Third World: Policy, Content and Context*. New York: Garland Publishing.

Farrell, J.P. and Heyneman, S.P. (1989). *Textbooks in the Developing World*. World Bank, Washington, D.C.

Fuller, Bruce (1987), What school factors raise achievement in the Third World? *Review of Education Research*, 57(3), pp. 255-272.

Fuller, Bruce and Prema Clarke (1993), Raising school effects while ignoring culture? Local conditions and the influence of classroom tools, rules, and pedagogy, *Review of Education Research*.

Fuller, Bruce and Conrad W. Snyder, Jr. (1991), Vocal teachers, silent pupils? Life in Botswana classrooms, *Comparative Education Review*, 35(2), pp. 274-294.

Heyneman, S.P., J.P. Farrell and M.A. Sepulveda-Suardo (1978), *Textbooks and achievement: What we know*. Staff Working Paper, The World Bank.

Heyneman, S. (1976). Influences on academic achievement: A comparison of results from Uganda and more industrialized societies. *Sociology of education*, 49, pp. 200-211. [observe number of textbooks available and used by pupils within classrooms]

Heyneman, S. & W. Loxley (1983). The effect of primary-school quality on academic achievement across twenty-nine high and low-income countries. *The American journal of sociology*, 88(6), pp. 1162-1194. [review of item above]

Heyneman, S. & D. Jamison (1980). Student learning in Uganda: Textbook availability and other factors. *Comparative Education Review*, 24(2), pp. 206-220.

Heyneman, S.P., D. Jamison and X. Montenegro (1983), Textbooks in the Philippines: Evaluation of the pedagogical impact of a nationwide investment, *Educational Evaluation and Policy Analysis*, 6(2), pp. 139-50.

Jamison, D., B. Searle, K. Galda, & S. Heyneman (1981). Improving elementary mathematics education in Nicaragua: An experimental study of the impact of

textbooks and radio on achievement, *Journal of Educational Psychology*, 73(4), pp.556-567.

Jansen, Jonathan (1994), *Beyond effective schools: A critical synthesis of the literature and an alternative proposal with particular reference to developing countries*. Unpublished paper.

Lockheed, Marlaine E. and Andre Komenan (1989), Teaching quality and student achievement in Africa: The case of Nigeria and Swaziland, *Teaching and teacher education*, 5(2), pp. 93-113.

Lockheed, M.E., Fuller, B. and S.C. Bail (1986). How textbooks affect achievement in developing countries: Evidence from Thailand. *Educational evaluation and policy analysis*, 8(4), pp. 379-392.

Prophet, R., and Rowell, P. (1993), Coping and control: science teaching in Botswana. *Qualitative studies in education*, 6.

Samoff, Joel (1990), *Defining what is and what is not an issue: An analysis of assistance agency Africa education sector studies*. Paper presented at the Annual Conference of the Comparative and International Education Society, Anaheim, March 1990.

Samoff, Joel (1993), The Reconstruction of Schooling in Africa. *Comparative Education Review*, 37 (2), pp. 181-122.

Sepulveda Stuardo, Manuel A., and Joseph P. Farrell (1983), The use of textbooks by teachers and students in learning and teaching, in E. Schiefelbein, J.P. Farrell, and M. Sepulveda-Stuardo (eds.), *The influence of school resources in Chile: Their effect on educational achievement and occupational attainment*. (Staff Working Paper No 530.) Washington, D.C.: The World Bank.

University of Cape Coast Centre for Research on Improving Quality of Primary Education in Ghana (1993), *Research reports on availability & utilization of materials in the central region of Ghana: Phase 1 study*. Arlington, VA: Institute for International Research.

Windham, Douglas M. (1990), *Improving the efficiency of educational systems*. Washington, DC: U.S. Agency for International Development.

Research in the United States

Alvermann, D. (1987), The role of textbooks on teachers' interaction decision-making. *Reading Research and Instruction*, 26(2), pp. 115-127.

Ball, Deborah, L. and Sharon Feiman-Nemser (1988), Using Testbooks and teacher's guides: A dilemma for beginning teachers and teacher educators, *Curriculum Inquiry* 18, pp. 401-423.

Barr, R., and Sadow, M.W. (1989), Influence of basal programs on fourth-grade reading instruction. *Reading research quarterly*, 24(1) pp. 44-71.

Barton, Allen H. and David E. Wilder (1966), Research and practice in the teaching of reading: A progress report, in *Innovation in education*, ed. Matthew B. Miles (New York: Teachers College, Columbia.

Cronbach, Lee J. (1955), The text in use, *Text materials in modern education*, ed. Lee J. Cronbach (Urbana: U. of Illinois Press.

Degrees of Reading Power (1979). New York: College Entrance Examination Board.

Durkin, Dolores (1984), Is there a match between what elementary teachers do and what basal reader manuals recommend? *Reading teacher*, 37, pp. 734-44.

Educational Products Information Exchange Institute (EPIE) (1977), *Report on a national study of the nature and quality of instructional materials most used by teachers and learners*, no. 76 (NY).

Freeman, D.J., G. M. Belli, A.C. Porter, R. E. Floden, W. H. Schmidt, and J.R. Schwillie (1983), The influence of different styles of textbook use on instructional validity of standardized tests, *Journal of educational measurement*, 20(1), pp. 259-270.

Freeman, D.J. & A. C. Porter (1988). Do textbooks dictate the content of mathematics instruction in elementary schools?, *American educational research journal*, 26(3), pp. 403-421.

Glaser, B. G. (1965), The constant comparative method. *Social problems*, 12, pp. 436-445.

Glaser, B. G. and A. Strauss (1967), *The discovery of grounded theory*. Chicago: Aldine.

Goetz, J. P. and M. D. LeCompte (1984), *Ethnography and qualitative design in educational research*. New York: Academic Press.

McCutcheon, Gail (1981), How do elementary school teachers plan? *Elementary school journal*, 81, pp. 4-23.

McCutcheon, Gail (1982), *Textbook use in a Central Ohio elementary school*. Paper presented at the American Educational Research Association.

McCutcheon, Gail and Fredrick Burton (n.d.), *A qualitative study of children's responses to textbook-centered classrooms*. ERIC 216 968.

Patton, M. Q. (1990), *Qualitative evaluation and research methods*. Newbury Park, CA: Sage.

Schmidt, W., A. Porter, R. Floden, D. Freeman, & J. Schwille (1987), Four patterns of teacher content decision-making. *Journal of curriculum studies*, 19(5), 439-455.

Sosniak, Lauren A. (1993), Teachers and textbooks: Materials Use in four fourth-grade classrooms," *Elementary School Journal* 93(3), pp. 249-75.

Stodolsky, S.S. (1989), Is teaching really by the book? In P.W. Jackson & S. Haroutunian-Gordon (eds.), *From Socrates to software* (88th yearbook of the National Society for the Study of Education, Pt. 1), pp 159-184.

Turner, Rebecca, R. (1988), How the basals stack up. *Learning*, 17, pp. 62-64.

Weiss, Iris R. (1987), *Report of the 1985-86 national survey of science and mathematics education*. Research Triangle Park, NC: National Science Foundation.

Woodward, Arthur & David L. Elliott (1990), Textbook use and teacher professionalism. *Textbooks and Schooling in the United States* (89th yearbook of the National Society for the Study of Education), pp. 174-193.

Wright, H. F. (1967), *Recording and analyzing child behavior*. New York: Harper & Row.