

What Characterizes an Effective Teacher? an exclusive interview with Barak Rosenshine ¹

Charles Dickens created the characters Thomas Gradgrind and Mr. M'Choakumchild in his novel *Hard Times* to satirize schoolteachers who taught "nothing but facts" and regarded students as "little vessels ... ready to have imperial gallons of facts poured into them until they were full to the brim."

Since education involves the continuing acquisition of organized knowledge, filling young minds with disconnected facts obviously isn't the way to produce an educated child. But do we know if today's student-centered "discovery learning" classrooms perform any better than those of Dickens' day?

In fact, we do know a great deal about the effectiveness of different instructional methods, thanks to the work of education psychologist and researcher Barak Rosenshine over the past three decades.

Rosenshine first made his mark in research on teacher performance just a year after joining the faculty at the University of Illinois at Champaign-Urbana in 1971. He and Norma Furst identified the five characteristics of teacher behavior that showed the strongest relationships with measures of student achievement: clarity of exposition, teacher enthusiasm, task orientation, varied approaches, and giving the student the opportunity to learn. Since then, these findings have served as a framework for additional research on teacher performance.

After reviewing additional research studies on teacher performance and the mechanism of student learning, Rosenshine and Robert Stevens in 1986 developed a six-function teaching model to describe the necessary of instructional steps that are involved in having a student learn new skills.

Rosenshine, an accomplished marathon runner, earned an undergraduate degree in psychology at the University of Chicago in 1957 and was awarded a Ph.D. in educational psychology from Stanford University in 1968. He was on the faculty at Temple University from 1966 to 1970, before joining the faculty at the University of Illinois, where he is now Professor Emeritus in the Department of Educational Psychology. Rosenshine recently spoke with *School Reform News* Managing Editor George Clowes.

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Clowes: *How did you become involved in research on learning instruction?*

Rosenshine: I started out as a high school teacher, teaching U.S. history for six years before going to graduate school at Stanford. When I arrived there, in 1963, I came across a book called *Handbook of Research on Teaching*, and I said, "That's it—I want to study how to improve teaching." I took the class that used the book and I've been studying research on teaching ever since.

Clowes: *If we're talking about better teaching methods, we need to have some idea of the end result that teaching is intended to achieve. What is the aim of educating a child, and how would you define a satisfactory finished product?*

Rosenshine: Education involves starting with a novice and helping the novice become an expert who has strong, readily accessible background knowledge. It's important that background knowledge be readily accessible, and this occurs when knowledge is rehearsed and well-connected and tied to other knowledge. As anyone knows who's studied all night for an exam, that knowledge may not be accessible a month later because it hasn't been sufficiently rehearsed or applied.

Experts not only have well-developed knowledge, they also have strong connections between different parts of that knowledge. When experts access one piece of knowledge, they also access all the other related pieces.

For example, if you mention one thing about the Civil War to American history experts, they are able to connect that information to the intellectual, the economic, and the political knowledge they have about the Civil War. Not only can they connect, but the connections are firm, and are readily accessible because they have been practiced. These knowledge structures are called schema and experts have well-developed and well-connected schema.

Clowes: *It sounds as if the computer is modeled after the way the human mind works, with memory for storage of facts and the key being whether you can access them when you need them.*

Rosenshine: One very promising area of teaching research has been to compare the knowledge structures of experts and novices. For example, the experts might be professors of physiology and the novices might be interns or graduate students. Or the experts could be experienced lawyers and the novices were first-year lawyers.

What the researchers consistently found was that the experts had more and better constructed knowledge structures and they had faster access to their background knowledge. These findings occurred in diverse areas such as in chess, in cardiology, chemistry, and law. They also compared expert readers with poor readers and found that the expert readers used better strategies when they were given confusing passages to read.

A lot of expert-novice research was done from the mid-1980s until about 1992, but then it stopped. I would have hoped they would have gone on to ask questions such as, "What sort of education should novices go through in order to become like experts?" and "What does creating expert knowledge mean for classroom instruction?"

But, unfortunately, the research was never used to develop an instructional package for training experts. It was never used to establish instructional goals for classes to teach all children to be like the experts. Our goal should be to develop experts, and we're not doing it.

Clowes: *What do we know about the mechanism of learning that would help us develop an instructional method to develop children into experts?*

Rosenshine: First, there's the notion of teaching new material in small steps so that the learning process isn't overloaded by getting too much at once. In addition, there's structure, with the teacher delivering a well-organized presentation and providing students with models and demonstrations of the new material. Then the children begin to practice and are given sufficient supervised practice until they are consistent.

The aim is to have students connect the new material to previous material and to practice until they become fluent, particularly if they're learning skills. Once that is accomplished, the students could go on to experiential learning activities involving inquiry and more com-

plex investigations.

We have found that the most effective teachers, those teachers whose classes made the highest yearly gain, provided a good deal of instructional support for the students. They provided this support by teaching new material in manageable amounts, modeling, guiding student practice, helping students when they made errors, and providing for sufficient practice and review. Many of these teachers also went on to experiential, hands-on activities, but they always did the experiential activities after, not before, the basic material was learned.

Clowes: *You have said that one way to help students learn is to provide them with cognitive strategies. What exactly does that mean?*

Rosenshine: "Cognitive strategies" refers to specific strategies students can use to provide a support in their initial learning. For example, in teaching writing there is a cognitive strategy called the five-paragraph essay. The format for this essay suggests that students begin with an introductory paragraph containing a main idea supported by three points. These points are elaborated in the next three paragraphs, and then everything is summarized in the final paragraph.

Some teachers hate this format. They think it's reducing learning and taking away creativity. Others love it. I once saw an excellent example of this format when I was observing teachers who had been nominated as being "inspiring." The teacher I was observing was teaching the five-step essay to an advanced class in English. The class had learned *Macbeth* and they were developing an essay to prove a particular point about the play.

On the first day, the teacher presented the prompts and modeled how to use it. With the class's help, he modeled the introductory paragraph. He then modeled how you would take each point and develop supporting arguments. Then he modeled the summary. During this instruction he presented the material using small steps. This instruction gave the students a framework within which they could develop their own material. The next day, the students worked in pairs to develop a five-paragraph essay on another issue from *Macbeth*. Then, on the third day they worked alone.

There were three types of support in these lessons: the framework of the five-paragraph essay within which the students could develop their arguments; the modeling by the teacher; and the temporary support of another student as they began to develop those arguments for themselves.

The teacher told me he used this same approach with classes of varying abilities and had found that the students in the slower classes hung on to the five-step method and used it all the time. Students in the middle used the method some of the time and not others, while the brighter students expanded on it and went off on their own. But in all cases, the five-step method served as a scaffold, as a temporary support while the students were developing their abilities.

Clowes: *It sounds like training wheels on a bike.*

Rosenshine: That's right. It is training wheels. It's a crutch. But no one walks with a crutch who doesn't need it. These prompts provide needed initial and temporary support.

Over the last fifteen years, a number of prompts have been developed which serve to help children learn new materials. For example, prompts have been developed to teach students how to summarize a paragraph. That teaches them to look for the main point and the details. Once children learn to do that, they can become better readers and better writers. It was shown, in a number of studies, that children who were taught these procedures were superior to control students.

The State Department of Wisconsin has produced a book of various types of or concrete prompts, prompts that can help students in writing, in reading, and in comprehension. Most of these prompts have been tested in experimental studies. One of the prompts is a story web, which involves mapping a story into a web structure. That teaches students to look for the structure in a story and once they've learned to do that, they become more independent readers.

Clowes: *You've made the point that it's easier for children to develop misconceptions with student-directed learning as compared to direct instruction. Could you address this issue?*

Rosenshine: Human beings are logical, and we try to be as logical as we can. But trying to be logical sometimes results in misconceptions. Take the question: Is the Earth closer to the sun in the winter or the summer? It seems logical to believe that the Earth would be closer to the sun in the summer, whereas in truth it's just the opposite.

Now, the fact that people are logical can lead to quite different implications for instruction. One implication would be to have discovery learning so that children are put in situations where they can use their logic and figure out their own learning. Another implication would be to avoid putting children in situations where they could develop misconceptions that would have to be corrected later.

Jere Brophy noted the possibility, in project-based learning, that some students will have difficulty distinguishing valid content from invalid content. Brophy said that students, particularly less able students, might have difficulty recognizing the signal amid all the noise. In the process of trying to make sense out of what may be a confusing situation, many students may develop quite logical-seeming misconceptions, misconceptions that then are very difficult to change.

Ziggy Engelmann also wants to be sure that children don't develop misconceptions when they are learning how to read with his direct instructing method. He knows that beginning readers frequently confuse the letters "b" and "d." He also knows that once they do confuse these two letters, it's very difficult to straighten them out. So Engelmann does not teach them close together, and he emphasizes visual differences between the two letters.

But when children learn those two letters in a discovery mode, then the chances of them developing the misconception increase. This is particularly a problem for lower-achieving children. They are more likely to develop misconceptions and they are more likely not to be able to straighten out the misconceptions later. The structured approach to initial learning makes most sense for them.

I've been to a number of schools with large proportions of children in the federal Free and Reduced Lunch program where all the children learn how to read and decode in kindergarten, and are reading fluently after a few months in first grade.

What I've found at those schools is a strong, basic approach to learning, but with room provided for experiential learning after the children have mastered the basics. In other words, provide the initial instruction by the teacher, be sure the children know what they're doing, and then send them off into the experiential learning.

This is exactly what Alex Molnar and John Zahorik reported in the latest study from the University of Wisconsin-Milwaukee on the SAGE class-size reduction experiment in Wisconsin. They identified teachers whose students were consistently high-achieving and compared them with teachers whose students were consistently low-achieving. They found the primary teaching method of the higher-achieving teachers is explicit instruction. These teachers also engage their students in experiential learning.

But they point out the experiential learning comes after more teacher-centered instruction. In other words, the higher-achieving teachers use explicit teaching first and then use experiential learning only *after* students have developed a firm grasp of the new knowledge. I used to talk about this years ago as a funnel, where, when you're starting, you do the basic stuff, and then, as the children get better, you expand it and open it up. This study is an example of that. It also has some beautiful examples of teachers who present and model, and do it quickly.

1. Daily Review

- Review prerequisite skills

2. Presentation

- Start with a brief statement of goals
- Introduce new material rapidly, but in small steps
- Demonstrate, illustrate, and provide examples

3. Guided Practice

- Guide student practice initially
- Obtain response and check for understanding

Achieve a high level of active practice

4. Correctives and Feedback

- Elicit specific responses

Monitor and give specific advice

5. Independent Practice (Seatwork)

Practice until responses are firm, quick, and automatic

6. Weekly and Monthly Reviews

Systematic review of previously learned material

For more information ...

Barak Rosenshine's most recent publication is "Converging Findings on Classroom Instruction," a chapter in the 300-page report, *School Reform Proposals: The Research Evidence*. The January 22, 2002 report, edited by Alex Molnar and published by the Education Policy Studies Laboratory at Arizona State University, is available on the Internet at www.asu.edu/educ/eps/Archives/EPRU%20Archives/epru-rw.htm

The learning prompts book, *Strategic Learning in the Content Areas*, from the Wisconsin Department of Public Instruction, is available from the Department's web site at www.dpi.state.wi.us/dpi/dltcl/eis/pubsales/litrcy_4.html.