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PROVE-ing What You Know

Using a Learning Strategy in an Inclusive Class

David Scanlon

One day recently, I was observing seventh-graders practicing the learning strategy described in this article. A student named Randel, who normally worked with a one-on-one aide, was on his own that period. Knowing that the classroom teacher needed help to work with Randel and the 22 other students, I sat next to Randel to help him learn the strategy. This was a science class, and the teacher had asked the students to use the strategy to explore whether or not viruses were living. The strategy was designed to help students state what they know, explain it, and defend their understanding.

Research in inclusive classrooms has indicated that students with and without learning disabilities improve expressive skills with the PROVE Strategy.

Randel was unsure of how to use the strategy sheet the other students were filling in to document what they knew. This was not surprising, given that when he worked on the strategy his aide usually directed him through each step. Randel also was unsure of how to answer the teacher's question. When I asked him to explain whether viruses are alive, he answered, "I don't know."

So, I decided to back up and asked, "How could you tell if a virus was alive?"—a seemingly logical place to start.

He again replied, "I don't know."

Asking the question twice more in slightly different ways only produced more "I don't knows."

So I decided to back up even further and asked, "Are you alive?"

"Yes."

"What about a rock—is a rock living?"

"No," he replied.

"OK, how are you different from a rock?"

"I don't know."

Randel likely *did* know some ways that he is different from a rock. At a minimum, he was exhibiting a textbook case of "learned helplessness" (Grimes, 1981). If I had asked him 20 more questions, he might have stuck with "I don't know." In learned helplessness, the student learns to avoid failure or an uninteresting task by acting helpless. This response can have a snowballing effect: The student gets out of learning foundational content or skills and avoids learning to think independently. Learned helplessness avoids making mistakes. Eventually, the student really doesn't know.

Just as Randel probably knew *some* ways that he is different from a rock, he probably knew *something* about viruses. Why did he keep saying he didn't know? He might have been intimidated by the question, or he may not have realized that what he did know could be helpful. Or perhaps he "knew" that his knowledge was insufficient for a correct answer to the question.

The PROVE Strategy his classmates were learning was developed to help students identify, explain, and defend what they know. It also guides them to

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Ask students to explain how they could figure out the answer and proceed from there.

seek information when they realize there is something they don't know (see box, "The Importance of Naming, Explaining, and Defending Knowledge").

Regardless of whether Randel did not want to answer or did not think he could, *he* did not make a mistake (learned helplessness avoids mistakes), but *I did.* In trying to question him, I was not looking at the situation from Randel's viewpoint. Randel was at a disadvantage because he did not fully participate in the curriculum. The teacher's question was challenging, but it was a reasonable one to ask the rest of the class. Most of the other students worked hard and came up with good answers. My questions were probably not of much help to Randel, however, because they followed the progression of how *I* would think of an answer, not necessarily how Randel would.

I asked him the series of questions because I wanted him to think about what conditions constitute "alive" and whether viruses meet these requirements. But I would have been more help if I had asked Randel to explain *how he could figure out the answer* and proceeded from there. If it turned out that Randel did not know an efficient way, I could then have shown him one. In teaching Randel the PROVE Strategy, I would show him when, why, and how to ask himself particular types of questions; and I would show him how to ask himself questions that were helpful to him instead of relying on a teacher to ask him for some daunting "right answer."

Randel's responses were not unusual. Even students who give correct answers often think to themselves, "I don't really know," "I don't know why," or "I don't know why it matters." This article shows how students can answer these questions for themselves and gain

The Importance of Naming, Explaining, and Defending Knowledge

Learning information means that you understand it and can think critically about it. Naming information but not discussing it is only useful on tests and game shows. Thus, an important measure of student understanding is whether students can explain and defend what they know. Students who can name information often wrongly assume that they understand it.

For example, students who claim to "know all about the Alamo" may not know more than a few key facts. These students might confidently sit down to write an essay or launch into a debate with a classmate only to realize that they can name key concepts about the Alamo but not explain or defend any of it. These students' mistake was to assume, but never investigate, what they knew—or didn't know. This assumption is a form of "inactive learning" (Torgesen, 1982) or "mindless" engagement (Langer, 1989) that characterizes many students with learning disabilities.

As the label "learning disability" suggests, students with this disability often take a passive approach to learning. Many have difficulty identifying important concepts in a lesson or reading (Carlisle, 1993) and expressing and explaining concepts they do know (Scanlon, Schumaker, & Deshler, 1994). Students with learning disabilities also tend not to ask themselves questions about what they know and how they are learning, something strategic learners do (Pressley, Borkowski, & Schneider, 1987). Students with learning disabilities benefit from learning strategies to monitor their thinking (Deshler et al., 2001; Ellis, Deshler, Lenz, Schumaker, & Clark, 1991). Students should have opportunities to practice naming, explaining, and defending what they know through self-questioning, so they will be able to refine that knowledge and learn how to express it.

Naming Knowledge. A first step to explaining and defending a concept is to name it. Students who say, "I know about the Alamo," for example, have not named what they know. To avoid a false sense of security and realize what they actually know, students should get in the habit of fully stating their knowledge. By stating knowledge as a proposition, students name a concept and some quality of it.

Students can best understand "naming" if they learn to state their knowledge in a complete sentence. But not just any complete sentence will do. "I know about the Alamo" is a complete sentence. Rather, a proposition as a complete sentence states *what* the students know about the subject. Thus, "I know about the Alamo" becomes, at least, "The Alamo is a building in San Antonio, Texas" (but even this fact about the Alamo is disputed), or "The Battle of the Alamo was fought so Texas could join the United States." An individual student's knowledge might be a fact, an opinion, or conditional knowledge (information that depends on certain circumstances to be true; see Figure 1). Students who cannot name knowledge as a proposition can immediately question whether they know what they assumed they did. When students state a proposition, they are declaring *what* is known and are prepared to communicate it.

Figure 1. Three Types of Knowledge to Be PROVE-d

Factual	Santa Anna's army attacked the Alamo to keep Texas part of the Republic of Mexico.
Opinion	The volunteers inside the Alamo acted to allow Sam Houston time to build an army.
Conditional	The Battle of the Alamo was fought for independence.

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Providing Evidence for Knowledge. Naming knowledge is an important first step but, by itself, is insufficient. Students should also be able to provide evidence to support their factual, opinion, or conditional knowledge. Providing evidence requires students to check their understanding; it also prepares them to demonstrate what they know. Certain evidence is better than other types of evidence. Some evidence can be related to the topic, but does not actually support the proposition (e.g., "Davy Crockett was upset about losing an election when he joined the Tennessee Mounted Volunteers at the Alamo") or can contradict the proposition (e.g., "The Texan Volunteers wanted Texas to be an independent Mexican territory"). Students need to match their proposition and evidence.

Because we know that even "facts" can depend on circumstances and perspectives (Howe, 1998), the first step of providing evidence involves providing a rationale for *why* they know or believe something. A rationale is a principle or reason that undergirds a proposition. For example, students studying the Alamo should be able to name why different individuals were fighting. Once students express why a proposition is correct, they should then provide supporting evidence.

Supporting evidence can be in the form of an example or an explanation. Examples and explanations provide evidence of *how* students know a concept. Thus, students who can state the proposition "The Battle of the Alamo was fought so Texas could join the United States" but cannot explain how that is the case or offer examples likely do not understand motivations for the Battle of the Alamo. An explanation brings clarity to a topic or gives the meaning of it. For example, a student might explain how events leading to the battle provoked various participants into fighting. Sometimes concepts can be difficult to explain, even when they are well understood. Examples can also represent why something is so.

Attempting to provide supporting evidence for knowledge can help students realize whether they know why they hold a fact or belief. When trying to explain or provide an example of a rationale, students must think about what type of information would be sufficient evidence and whether they know of any. The combination of a rationale and evidence confirms that students understand a concept and reveals how the students know it to be accurate. Linking the rationale and the evidence ensures students are not leaving assumptions untested.

Defending Knowledge. Suppose a student has told what she knows about the Alamo and has given a rationale and evidence. Suppose another student confronts her with, "Well, I heard that the Battle of the Alamo was fought so Sam Houston could become president." The original student, who claims to understand the battle, ought to be able to defend that knowledge against this challenge. Students should consider competing perspectives so they can decide what is right and wrong.

Bryan, Donahue, and Pearl (1981) found that students with learning disabilities often have difficulty defending knowledge when it is challenged (see also Gleason, 1999). Sometimes a challenge will provoke students to abandon what they "knew," or to reconcile it with another perspective. For example, students who thought the Alamo was a war between nations would have to expand that perspective after learning that some soldiers fought to shape Mexican government (much like a civil war to some, but a revolution to others); others to create a free Texas; and still others so a new state of Texas could join the United States.

Defending knowledge can help students understand the limits of a proposition. Sometimes referred to as "rules" or "examples and nonexamples" (Bulgren & Scanlon, 1998; Prater, 1993), students must learn the parameters of their factual, opinion, or conditional knowledge. For example, if the student stated, "The outcome of the battle was U.S. citizenship for Texans," she should note that Texas was first an independent nation and that not all inhabitants were granted citizenship.

Students should have opportunities to practice naming, explaining, and defending what they know through self-questioning.

a deeper understanding of what they learn in school.

The PROVE Strategy

The PROVE Strategy provides students with a procedure for naming a concept, providing evidence (both *why* and *how*), and defending it. It has features that make it easy to perform and easy to recall. Researchers have found that learning strategies like PROVE make learning efficient and effective for students with mild disabilities (Deshler et al., 2001). The following features make PROVE effective:

- Steps that break down the procedure.
- Cues to perform each step worded as the action to perform.
- A strategy sheet (see Figure 2, page 51) students use to reduce cognitive overload while learning the strategy.
- A mnemonic device (P-R-O-V-E) to help students recall the steps.

Here are the PROVE steps:

P. To begin the strategy, the student names a proposition. The step "Present the knowledge I will PROVE" cues the student how to begin. For example, if Randel believes that viruses are alive, he would state, "Viruses are alive."

Students learn that an acceptable knowledge statement expresses *what* they know or believe about a concept. They are also reminded that the statement should be one complete sentence. Figure 3 shows examples of how Randel could explain the proposition, "Viruses are alive."

R. After naming a proposition, the next step is to "Reveal information to support my knowledge." This information is the rationale, or *why* statement. A student who memorizes correct answers without understanding them will have difficulty completing this step. Randel would have to think about the properties of viruses and what constitutes "living" to reach a conclusion for this step.

When students begin to learn the PROVE Strategy, they often have difficulty distinguishing between the rationale and evidence for their knowledge. Because this step can be confusing, some try to skip it, claiming it is unnecessary if they provide an explanation or example in the next step. By skipping this step, they risk assuming that they understand the information. A rationale statement is a declaration of understanding; without it, what the evidence supports is ambiguous.

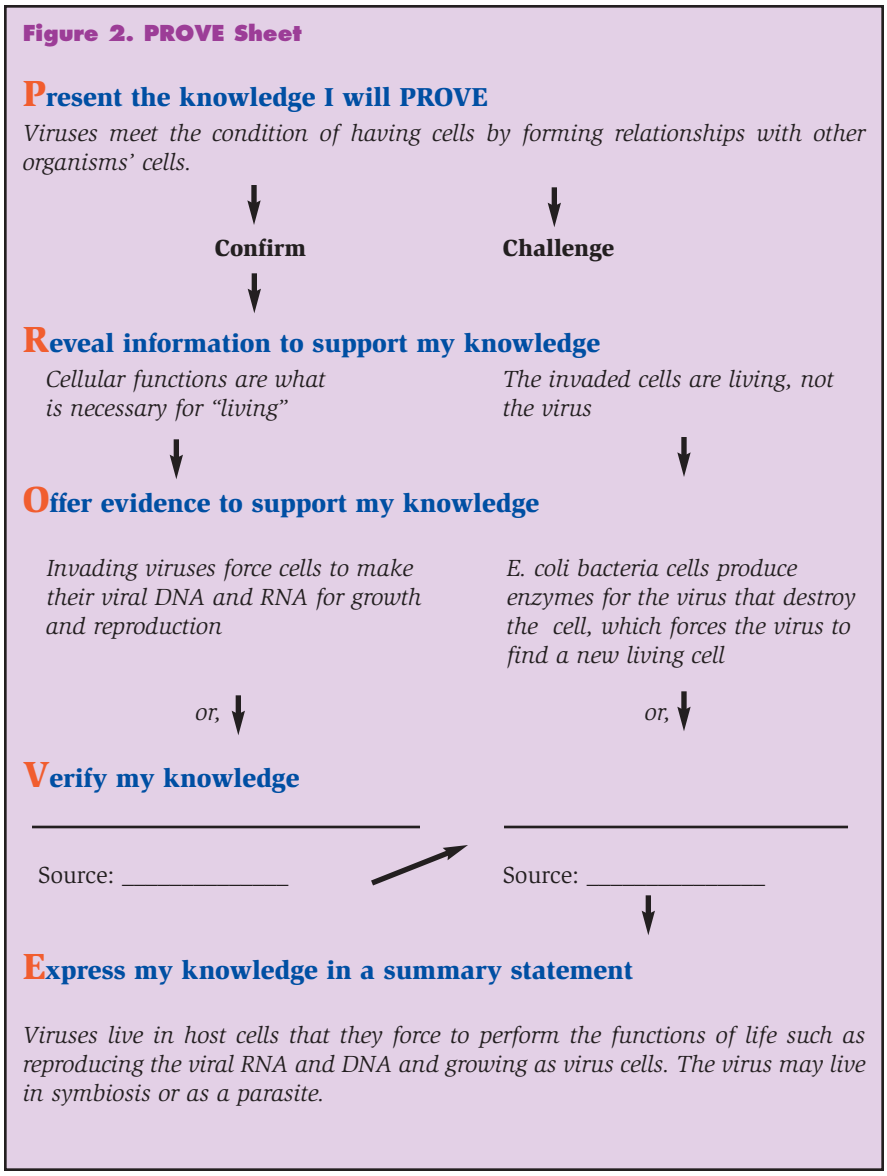
O. Once the student states a rationale, he or she is ready to "Offer evidence to support my knowledge." The evidence should directly support the rationale in the "R" step. The explanations or examples demonstrate *how* the proposition is correct. If Randel did not know of any properties of viruses, he would not have evidence that his knowledge is accurate. This predicament should cause Randel to question whether his rationale or proposition is what he actually knows to be true. Thus, the PROVE Strategy guides a student to not only name knowledge, but to reflect on it critically.

V. Randel might not know of evidence to support his rationale, but this may not mean that he should abandon his rationale. A student who cannot "offer evidence to support my knowledge" but believes the rationale is sound, instead completes the "Verify my knowledge" step. In this alternative step, the student still provides an explanation or example, but seeks that evidence from a resource other than memory. Randel might ask his aide, the teacher, or a classmate, or he might look it up in class notes or a book. Even if students cannot recall evidence for the "Offer" step, they still should be able to think of what evidence should support the rationale. Thinking about necessary evidence cues students about what information to seek.

Randel would know that he needed to find out whether viruses form cells, respond to environment, can grow, or reproduce (the four conditions of "living") to support his rationale. By separating the "Offer" and "Verify" steps, the strategy cues students to first rely on their own knowledge but then to seek out information they do not know. The "V" step is shaded on the PROVE Sheet to remind the student to skip this step if "O" is completed. A student who completes the "Verify" step should make note of where the information was located; chances are the student may have cause to revisit the source.

Challenge. Now that the student has stated what he or she knows, why it is so, and how it is known, the student should be prepared to defend that

Figure 2. PROVE Sheet



Learning information means that you understand it and can think critically about it.

Figure 3. Steps for PROVE-ing Knowledge

What **Name the Concept** (fact, opinion, or conditional knowledge)
Viruses are alive.

Why **Provide a Rationale**
Viruses meet the essential conditions for "living."

How **Provide Evidence**
Explanation *While they may not respond to the environment, viruses do reproduce and grow when they become part of an organism's cell.*
or
Example *Parrot Fever Virus invades a cell and replaces its DNA, which then divides for growth.*

Defend **Present Challenge**
Rationale *Even when they invade cells, viruses do not meet any of the conditions of "living"; it is the infected cell that does.*
Evidence *Viral infections cause cells, not viruses, to grow, environmentally respond, and reproduce (e.g., some cancers).*

knowledge in the face of a challenge. To perform the *Challenge* portion of the strategy, the student must first learn what makes a reasonable challenge. As is the case in a good debate, a reasonable challenge has merit to refute a proposition.

For example, several of Randel's classmates claimed that living things are composed of cells, and viruses are not. In the face of this challenge, Randel should certainly want to know if he is correct. He can test his knowledge by asking himself what a reasonable challenge to his proposition would be. He only needs to respond to reasonable challenges. Students who might say, "It just can't be true," or "Little green Martians made your virus alive" have not presented credible challenges to Randel's knowledge. If a classmate challenged Randel with a credible statement like, "Living things meet four conditions, including being made of cells," he could revise his proposition to include a statement like, "Viruses meet some conditions for 'living' that cells do."

The word "prove" reminds students of the strategy's steps and that they can use the strategy whenever they want to prove they know something.

Students must know that knowledge should be questioned, and they should be willing and able to question their own knowledge to determine if it can withstand a reasonable challenge. This kind of self-questioning is a classic debate skill (Freeley, 1996). To complete the challenge portion of the strategy, the student thinks of a rationale and evidence that *could* refute the proposition. Students learning the PROVE Strategy are sometimes tempted to use the "Challenge" to question their confirming rationale or evidence statements. Those challenges should have been made when determining whether there was support for the proposition. This portion of the strategy is about whether there is reason to dispute the proposition.

E. The final step of the strategy, "Express my knowledge in a summary statement," cues the student to make a new complete statement that accounts for the confirming and challenging perspectives. Once students have confirmed their proposition by providing a rationale and supporting evidence, as well as contemplated challenges to that proposition, the students should reassess what they know or believe.

For this step, students might need to state the proposition in more than one sentence. Depending on what the student realized, the 'Express my knowledge' statement might confirm the initial proposition, refute it, or express facets of both the confirming and challenging perspectives. For example, Randel's "Express" statement might be, "Viruses meet the critical conditions for living, including living in host cells."

To help students recall the steps of the strategy, they should remember the mnemonic device PROVE. Each letter cues a step of the strategy by its action word; the word "prove" reminds students of the order of the steps and that they can use the strategy whenever they want to prove they know something. To help students remember the procedures for each step, teach them that each step responds to the preceding one, and that they complete the "Challenge" steps after the confirming steps but before the "Express" step. The students can use a strategy sheet (Figure 2) to see the order of the steps.

When students are first learning the strategy, they will have the double task of learning the steps and learning about the content they are PROVE-ing. Writing information on the strategy sheet will help to reduce cognitive overload. In time, with practice, many students should be able to recall the steps and perform the strategy in their heads or on notebook paper.

The strategy begins as a test of students' knowledge, but it does not need to end there. If students state propositions they cannot support or defend, their statement is no more useful than saying, "I don't know." Likewise, completing the PROVE strategy but doing nothing with the information is of little use. Once students complete the strategy, they can use it to study or self-assess their learning. The information can contribute to identifying further learning goals. Students can also use the information as notes for a debate or to organize an essay or report. Teachers can signal the importance of the strategy by

assigning students to complete PROVE strategy sheets for credit.

Research to Support the Effectiveness of the Strategy

In a research study that included seventh-graders from two inclusive middle schools, 12 students with learning disabilities (average age, 13 years, 7 months, and average reading grade equivalent, 6.4) and 26 students without disabilities (average age, 13 years, 6 months, and average reading grade equivalent, 12.6) learned the PROVE Strategy.

Before they learned PROVE, all students completed pretests in their content-area classes. The students read vignettes with ambiguous outcomes and wrote solutions to the vignettes (topics included voting rights, food storage, and poetic interpretation). After learning PROVE from their content-area teachers and practicing the steps, they read the same vignettes and again wrote solutions. The investigators analyzed the pre- and posttests to determine whether the students incorporated elements of good PROVE statements at either time.

Scores were assigned for each element of a PROVE statement (i.e., proposition, rationale, supporting evidence, challenge statement, express new knowledge) and the quality of the students' written responses. The findings indicated that students with and without learning disabilities performed similarly at both pretest and posttest, although those without disabilities tended to achieve marginally higher at posttest. While there were some patterns to what steps students most improved, in general, students improved from pre- to posttest; and the overall quality of their statements was improved at posttest.

Strategic learners and their teachers take responsibility for their quality of learning.

Implications for Practice

The PROVE Strategy is well suited for students in inclusion classrooms. Because it is a learning strategy, it is designed so students can self-cue when to use it and can monitor their own performance. Many inclusion teachers have commented that the academic diversity of their students prevents them from carefully monitoring individual students' performance (Bergren, 1997). Teaching students *strategic independence* is one way to support them.

Because the strategy addresses skills that virtually all students could stand to improve, it is appropriate for *all* students in the inclusion classroom. Requiring it of all students will increase the teacher's ability to monitor strategy performance (for more on how to teach strategies in various settings, see Deshler et al., 2001). Because PROVE is for *interrogating knowledge of concepts learned,* it is ideally suited for content-area classes, such as English, science, social studies, and vocational education. Students who participate in these classes will not benefit from memorizing concepts without understanding them.

Learning strategies are found effective in reducing learned helplessness and inactive learning among students with mild disabilities (Deshler et al., 2001). The self-cueing and self-monitoring that strategies require help students become independent learners. Once a student learns a strategy, he or she "owns" it. This means that students should be able to apply the strategy as needed, even in the classes of teachers who know nothing about it.

Here's an important caution, however: Although the PROVE Strategy helps students to check their own thinking, it is not a guarantee that they will arrive at "correct" knowledge. In questions about the life status of viruses and the events of the Alamo, even scientists and historians are in constant debate, but many other facts are more clearly right or wrong. A student could use the strategy to present a logical argument that rocks are alive, for example. This is not a fault of the strategy—it is designed to guide one's thinking about a topic, not to teach the topic. Strategic learners and their teachers take responsibility for their quality of learning.

Students should be able to apply PROVE as needed, even in the classes of teachers who know nothing about the strategy.

References

Bergren, B. A. (1997). *Teacher attitudes toward included special education students and co-teaching*. (ERIC Document Reproduction Service, ED 408 754)

Bulgren, J. A., & Scanlon, D. (1998). Instructional routines and learning strategies that promote understanding of content area concepts. *Journal of Adolescent and Adult Literacy*, *41*, 292-302.

Bryan, T., Donahue, M., & Pearl, R. (1981). Learning disabled children's peer interactions during a small group problem-solving task. *Learning Disability Quarterly*, *4*, 13-22.

Carlisle, J. F. (1993). Understanding passages in science textbooks: A comparison of students with and without learning disabilities. In D. J. Leu & C. K. Kinzer (Eds.), *Examining central issues in literacy research, theory, and practice* (pp. 235-242). Chicago: National Reading Conference.

Deshler, D. D., Schumaker, J. B., Lenz, B. K., Bulgren, J. A., Hock, M. F., Knight, J., & Ehren, B. J. (2001). Ensuring content-area learning by secondary students with learning disabilities. *Learning Disabilities Research & Practice*, *16*, 96-108.

Ellis, E. S., Deshler, D. D., Lenz, B. K., Schumaker, J. B., & Clark, F. L. (1991). An instructional model for teaching learning strategies. *Focus on Exceptional Children*, *23*(6), 1-24.

Freeley, A. J. (1996). *Argumentation and debate: Critical thinking for reasoned decision making.* Belmont, MA: Wadsworth.*

Gleason, M. M. (1999). The role of evidence in argumentative writing. *Reading & Writing Quarterly*, *14*, 81-106.

Grimes, L. (1981). Learned helplessness and attribution theory: Redefining children's learning problems. *Learning Disability Quarterly*, *4*, 91-100.

Howe, K. R. (1998). The interpretive turn and the new debate in education. *Educational Researcher, 27,* 13-20.

Langer, E. J. (1989). *Mindfulness*. Reading, MA: Merloyd Lawrence Book.

Prater, M. A. (1993). Teaching concepts: Procedures for the design and delivery of

instruction. *Remedial and Special Education*, *14*, 5-62.

Pressley, M., Borkowski, J. G., & Schneider, W. (1987). Cognitive strategies: Good strategy users coordinate metacognition and knowledge. *Annals of Child Development*, *4*, 89-129.

Scanlon, D., Schumaker, J. B., & Deshler, D. D. (1994). Collaborative dialogues between teachers and researchers to create educational interventions: A case study. *Journal of Educational and Psychological Consultation*, *5*, 69-76.

Torgesen, J. K. (1982). The learning disabled child as an inactive learner: Educational implications. *Topics in Learning and Learning Disabilities*, *2*, 45-52.

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