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CORE Reading Expert

Dyslexia: Finally a Focus in All but Eight States!

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CORE's recent dyslexia white paper communicated the fine line between a child who is having difficulty learning to read and a child who may have dyslexia. Since dyslexia lies on a continuum of severity, determining if a student is truly dyslexic is not an exact science. In this issue's Reading Expert, we will discuss early screening for students who may have reading difficulties or dyslexia and evaluating a child for a diagnosis of dyslexia. Both universal screening and evaluation are important assessment processes that serve different purposes.

Screening for Reading Difficulties and Dyslexia

CORE has long been clear on the four types of reading assessments and their purposes—screening, diagnostic, progress monitoring, and summative—and has been unequivocal in the message that all schools should be using early and universal reading screening as part of MTSS/RtI. The International Dyslexia Association (IDA) has a series of fact sheets about dyslexia. Two of their fact sheets on universal screening and assessment of dyslexia shed light on a potentially confusing topic regarding screening for students who may have reading difficulties or dyslexia and dyslexia evaluation. Universal screening is a way for teachers to assess all students and identify those who may be at risk for reading difficulties or dyslexia who then would need high-quality intervention. Evaluating a student for dyslexia is a means to an end, to determine if the student is dyslexic or not and to provide the more intensive support needed.

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The IDA fact sheet on universal screening suggests the following types of measures to screen all students for reading difficulties in kindergarten through second grade. In kindergarten it suggests "phonological awareness, including phoneme segmentation, blending, onset, and rime; rapid automatic naming, including letter naming fluency; letter sound association; and phonological memory, including nonword repetition" (Catts et al., 2015; Jenkins & Johnson, 2008). New information suggests that screening measures as early as kindergarten should also include phonological deletion tasks (e.g., "Say cowboy, now say it without cow [boy]"; Kilpatrick, 2015).

For first grade, the IDA fact sheet suggests "phoneme awareness, specifically phoneme segmentation, blending, and manipulation tasks; letter naming fluency; letter sound association; phonological memory, including nonword repetition; oral vocabulary; and word recognition fluency (i.e., accuracy and rate)" (Compton et al., 2010; Jenkins & Johnson, 2008). In second grade, word identification (real and nonsense words), oral reading fluency, and reading comprehension are the important constructs to screen students for reading difficulties. Many off-the-shelf screeners now in use (e.g., DIBELS, AIMSweb) assess most of the previously listed constructs, with the exceptions of possibly phonological memory in kindergarten and oral vocabulary and phoneme manipulation tasks in first grade.

In addition, more educators and researchers recognize that having multiple data points is beneficial as universal screeners have a tendency to overidentify students who may need intervention. A recently developed tool that can serve as a companion data point is Pearson Clinical's Shaywitz DyslexiaScreen. This screener is a teacher survey about the individual student, and it takes about five minutes to complete per child. The recommendation would be to complete this companion survey for only those students who have performed below benchmark on the universal screener. It is not necessary to complete the survey for every child in the teacher's classroom, as that would be needlessly time-consuming. The data from these screenings is then used to determine who needs additional instruction/intervention. High-quality instruction that follows the IDA's recommended structured literacy approach should be occurring at Tier 1 and also during Tier 2 intervention. If a student is still struggling, then further evaluation by a skilled clinician who is licensed to evaluate for dyslexia is warranted.

Dyslexia Evaluation

Consider the following quote from the IDA assessment fact sheet:

> "When students do not catch up after additional instruction and support using an RTI/MTSS approach, clinical evaluation is needed to determine and document the nature of the learning problem. After evaluation, the school team will consider the case history and the testing data and will determine eligibility for Special Education services under IDEA (Individuals with Disabilities Education Act). Data and evaluation results should be shared with parents throughout this process. For students with diagnosed specific learning disabilities (SLD) and dyslexia, the plan is typically an Individualized Education Plan (IEP), which provides both remediation and accommodations."

The article goes on to explain that many of the same reading constructs described previously should be assessed; however, the evaluation should also include spelling and writing at the sentence and paragraph levels. In addition, the evaluation should include any family history of reading problems, the history of the

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child's speech and language development, and the child's early educational history. Once the assessment and historical data has been collected by the skilled clinician, the information, reports, and test scores are synthesized into a well-written report to parents and the school team. "If the student is diagnosed with SLD or dyslexia, the written report clearly states recommendations for remediation, also called specially designed instruction, as mandated by federal law" (IDA, 2017). Only after this process will a diagnosis of dyslexia, or lack thereof, be clear.

With good screeners and effective evaluation, educators can identify children struggling with reading early and intervene swiftly. But make no mistake, the real key is preventing reading problems from developing in the first place. It is imperative that every classroom in every school provide high-quality, evidence-based Tier 1 instruction to prevent reading difficulties from the start. This means implementing faithfully a proven curriculum that demonstrates results with most students. Prevention of reading difficulties is very possible with students who may enter school as mildly dyslexic or come to school less prepared for the language demands that learning to read requires (phonological awareness and oral vocabulary). While we cannot prevent reading difficulty in all students who end up having moderate to severe dyslexia, high-quality instruction can go a long way toward giving these special students the more intensive help they need early. Students who still struggle even after receiving high-quality, evidence-based reading instruction in Tier 1 and early intervention in Tier 2 should be evaluated for dyslexia, and this can happen early in a student's educational career. It is tragic that many dyslexic students do not ever obtain a diagnosis or are diagnosed late in their educational careers. The academic and social suffering that these late or undiagnosed students endure is inexcusable when the field has known the science of learning to read for over 20 years. This last point holds true even for students who do not have dyslexia but never learn to read well enough to graduate high school and to be successful in college and/or career. It is long past the time to stop experimenting with instruction that has little or no research basis, for the students who never learned to read, for the students who struggle with dyslexia, and for our future as a nation.

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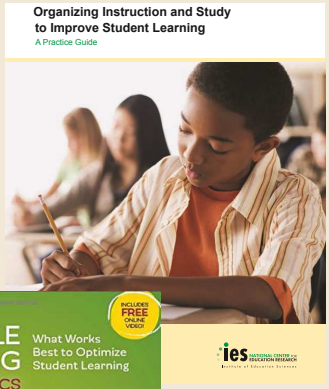
Techniques for Effective Teaching May Age, but They Do Not Expire, Part 2

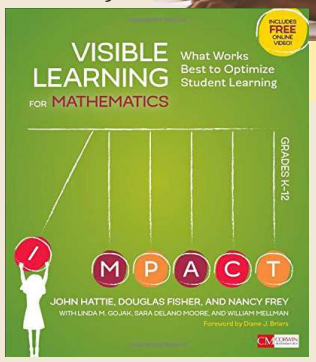
Correlations between Hattie, Fisher, and Frey's *Visible Learning for Mathematics* (2017) and the Institute of Education Sciences Guide *Organizing Instruction and Study to Improve Student Learning* (2007)

by Dean Ballard, Director of Mathematics, CORE, Inc.



(**Note:** Part 1 of this two-article series appeared in the Fall 2017 issue of the CORE *Academic Quarterly*.)

As mentioned in Part 1, the Institute of Education Sciences (IES) periodically publishes guides to provide recommendations on key educational topics. The recommendations are based on meta-analyses of relevant research. The IES Guide *Organizing Instruction and Study to Improve Student Learning* (Pashler et al., 2007) lists the following seven recommendations for teachers on strategies to facilitate improved student learning:



1. Space learning over time
2. Interleave worked example solutions with problem-solving exercises
3. Combine graphics with verbal descriptions
4. Connect and integrate abstract and concrete representations of concepts
5. Use quizzing to promote learning
6. Help students allocate study time efficiently
7. Ask deep explanatory questions

These seven recommendations are reinforced in the recent work of John Hattie, Douglas Fisher, and Nancy Frey titled *Visible Learning for Mathematics* (2017). In *Visible Learning for Mathematics*, the authors build on Hattie's 2007 meta-analysis of educational research in *Visible Learning: A Synthesis of Over 800 Meta-Analyses Relating to Achievement* to provide specific recommendations for teaching K–12 mathematics.

Recommendations from the IES Guide promote "tried and true" teaching techniques that recent work from Hattie, Fisher, and Frey reinforce as still effective. In the first of this two-article series, we described the correlations between Hattie, Fisher, and Frey and the first four recommendations from the IES Guide. In this second article, we highlight correlations between Hattie, Fisher, and Frey and IES recommendations 5–7. Included at the end of this article is a chart listing all seven IES recommendations, along with the "level of evidence" rating for each recommendation and the corresponding influential practices from Hattie, Fisher, and Frey, along with the related effect sizes.

IES Recommendation #5: Use quizzing to promote learning

Hattie: Provide formative evaluation and feedback

The IES Guide identifies research showing that testing student knowledge "not only enhances learning—it also reduces the rate at which information is forgotten" (p. 22). Assessments can come in many forms, both formal and informal, such as midchapter or weekly assessments, application tasks, exit tickets, puzzles, or even *Jeopardy*-style games. In each case, students are required to recall and apply knowledge. The act of pulling facts, procedures, and concepts from memory helps to solidify and enhance that knowledge in memory.

Techniques for Effective Teaching May Age, but They Do Not Expire, Part 2 (cont.)

Another key component is providing timely feedback to students. Errors on these assessments, if not corrected, tend to reoccur in the future. Hattie, Fisher, and Frey focus their discussion on formative assessments and timely feedback. Formative assessments are evaluations used to gather data that informs instruction. Examples of these types of assessments are using exit tickets, giving quizzes, calling on students to answer questions, and having all students respond on individual whiteboards. Teachers use information on student learning gathered from formative assessments to determine the next instructional steps that will most likely lead to further student learning. Students benefit by having instruction adjusted to their specific learning needs. Formative assessment combined with timely feedback provides students with a powerful learning opportunity that research shows to be highly effective, with an effect size of 0.75, which places it near the top of Hattie's list of most influential practices. Hattie, Fisher, and Frey describe four types of feedback, not all of which are considered effective (p. 205):

- Feedback about the task, such as feedback on how well the task has been performed
- Feedback about the process, for example, examining the strategies needed to perform the task
- Self-regulatory feedback, such as determining the knowledge and understanding needed to know how to be reflective about one's work
- Feedback about the self, for example, telling a student he or she is doing a great job

Hattie, Fisher, and Frey note that feedback about the task and the process are the most common types of feedback we see in classrooms. Feedback about the process, not just the task, "moves students to deeper learning" (p. 130). Self-regulatory feedback plays a prominent role in consolidation and transfer of learning (p. 206).

However, Hattie, Fisher, and Frey caution that feedback about the self can be detrimental if it promotes a fixed mindset. For example, simply telling a student that he or she is good at math can reinforce a belief that being good at math is the result of an inborn trait rather than effort. On the other hand, praising a student for going back to check the answer in order to catch a calculation error reinforces both the validity of the strategy used by the student and the student's "sense of agency as they see the relationship between their success and their actions" (p. 207).

The IES Guide and Hattie, Fisher, and Frey agree that assessing students on a regular basis is an effective technique to enhance learning. The IES Guide notes that benefits include consolidating knowledge and improving retention. Hattie, Fisher, and Frey point to the important role assessment data can play in adjusting instruction to improve learning outcomes, especially when combined with timely specific feedback.

IES Recommendation #6: Help students allocate study time efficiently

Hattie: Self-reported grades, metacognitive strategies, self-verbalization, and self-questioning

The meta-analyses of research in the IES Guide and from Hattie, Fisher, and Frey show that metacognition—learners' reflection on their own learning—can have a large impact on learning. Hattie, Fisher, and Frey identify at least three different practices related to metacognition with their high effect sizes shown in parentheses below (p. 235):

- Self-reported grades/student expectations (1.44)
- Metacognitive strategies (0.69)
- Self-verbalization and self-questioning (0.64)

Metacognition is not an automatic process for learners. The IES Guide points out that learners are not good at identifying what they do and do not know without some specific training to help them do so.

The inaccuracy in self-assessment is what is termed in the IES Guide as the "illusion of knowing" (p. 23). Hattie, Fisher, and Frey recommend providing students with questions that teach them how to self-question, such as "Does this make sense?" with a pre-lesson set of questions, and with questions that have the learner reflect on what was learned (pp. 185–189). Recommendations in the IES Guide include using the cue-only judgment of learning procedure in class with students, and teaching students how to use this technique on their own. This technique involves three essential steps (pp. 23–25):

1. Students test their mastery of a topic or concept after a delay of a day or a week.
2. When testing their own knowledge, students should be able to see only the cue, not the answer or a set of answer choices.
3. Students should estimate their likelihood of getting an answer on a test or quiz before taking the test or quiz.

IES Recommendation #7: Ask deep explanatory questions

Hattie: Classroom discussion

Mathematical discussions are the verbal and written communications centered on deepening thinking about and making sense of mathematics. Meaningful discussions include students comparing and contrasting ideas and methods, constructing viable arguments, critiquing each other's reasoning, and helping each other make sense of mathematics (Hattie, Fisher, & Frey, 2017; National Council of Teachers of Mathematics [NCTM], 2000; National Governors Association Center for Best Practices & Council of Chief State School Officers [CCSSM], 2010; National Research Council, 2001).

Meaningful discussions are built on deeper-level questions and higher-level tasks (NCTM, 2014; Stein et al., 2000). The IES Guide categorizes the level of evidence to be "strong" (their highest level) for the positive effects of asking deep-level questions, questions that "prompt students to reason about underlying explanatory principles" (pp. 29–31). Deep-level questions are most often linked to tasks that are at Norman Webb's (2017) depth of knowledge (DOK) levels 2 and 3.

Simply asking a deep-level question does not automatically lead to meaningful discussions. Getting students to think and respond to questions and guiding those discussions to the mathematical objectives of the lesson requires ongoing facilitation from the teacher (Hattie et al., 2017). This facilitation begins with initiating discourse and continues through promoting, managing, connecting, and concluding the discourse so that important mathematical connections are made explicit to all students.

Students need more time to answer deep-level questions than to answer surface-level questions, and students need the opportunity to learn how to answer these types of questions. The IES Guide recommends that teachers explicitly model asking and answering deep-level questions, using techniques such as think-aloud for both the teacher and students. The IES Guide also recommends asking questions that elicit explanations, such as "those with the following question stems: why, what caused X, how did X occur, what if, what-if-not, how does X compare to Y, what is the evidence for X, and why is X important?" (p. 30).

In addition to talking, writing responses to deep-level questions is an important form of thinking through mathematical ideas and explanations. Hattie, Fisher, and Frey state, "The first (and possibly easiest) layer of accountability you can offer students is to ensure that if anyone writes, everyone writes . . . Something about writing helps to focus the mind" (p. 163). Not all students can speak at once; however, all students can write at the same time and, therefore, be thinking about the mathematics. Through writing students have the opportunity to individually brainstorm, deepen understanding through explanation and justification, and self-reflect on learning.

Techniques for Effective Teaching May Age, but They Do Not Expire, Part 2 (cont.)

Conclusion

Recommendations from Hattie, Fisher, and Frey in *Visible Learning for Mathematics*, and from the IES Guide *Organizing Instruction and Study to Improve Student Learning*, agree and zero-in on key instructional techniques for improving learning that have held up over time. Techniques such as spacing learning over time, formative assessment with specific feedback, and student discussions prompted through deep exploratory questions have been and remain hallmarks of effective instruction. While many great new ideas and resources often emerge in education, it is important to retain and polish practices that have proven to work.

IES Guide (2017)		Hattie, Fisher, and Frey (2017)	
Recommendation	**Level of Evidence**	**Influence**	**Effect Size**
1. Space learning over time. *Arrange to review key elements of course content after a delay of several weeks to several months after initial presentation.*	Moderate	Spaced vs. massed practice	0.71
2. Interleave worked example solutions with problem-solving exercises. *Have students alternate between reading already worked solutions and trying to solve problems on their own.*	Moderate	Worked examples	0.57
3. Combine graphics with verbal descriptions. *Combine graphical presentations (e.g., graphs, figures) that illustrate key processes and procedures with verbal descriptions.*	Moderate	*Recommendations drawn from correspondence of multiple influences*	
4. Connect and integrate abstract and concrete representations of concepts. *Connect and integrate abstract representations of a concept with concrete representations of the same concept.*	Moderate	Manipulatives	0.50
5. Use quizzing to promote learning. *Use quizzing with active retrieval of information at all phases of the learning process to exploit the ability of retrieval directly to facilitate long-lasting memory traces.*	Low/Strong	Providing formative evaluation Feedback	0.90 0.75
6. Help students allocate study time efficiently. *Assist students in identifying what material they know well, and what needs further study, by teaching children how to judge what they have learned.*	Low	Self-reported grades/ student expectations Metacognitive strategies Self-verbalization and self-questioning	1.44 0.69 0.64
7. Ask deep explanatory questions. *Use instructional prompts that encourage students to pose and answer "deep-level" questions on course material. These questions enable students to respond with explanations and supports deep understanding of taught material.*	Strong	Classroom discussion	0.82

—Adapted from *Organizing Instruction and Study to Improve Student Learning* (Pashler et al., 2007, p. 2)

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CORE Leadership Corner

A new national center to support literacy, the National Center on Improving Literacy, focuses on providing evidence-based resources for schools, families, and state agencies to "screen, identify, and teach students with literacy-related disabilities, including dyslexia." The National Center on Improving Literacy is a partnership among researchers at the University of Oregon's Center on Teaching and Learning (CTL), Florida State University's Florida Center for Reading Research (FCRR), RMC Research Corporation, literacy experts, and technical assistance providers, with funding from the U.S. Department of Education. One of CORE's National Advisory Board members, Scott Baker, Ph.D., is co-director at the center.

Please take some time to explore this website's useful resources, and freely share the information with families at your schools.

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CORE serves as a trusted advisor at all levels of preK–12 education, working collaboratively with educators to support literacy and math achievement growth for all students. Our implementation support services and products help our customers build their own capacity for effective instruction by laying a foundation of research-based knowledge, supporting the use of proven tools, and developing leadership. As an organization committed to integrity, excellence, and service, we believe that with informed school and district administrators, expert teaching, and well-implemented programs, all students can become proficient academically. For more information about CORE, please visit our website at www.corelearn.com.