

## Learning How to Learn Could Be a Student's Most Valuable Skill

In a fast-changing workplace, the ability to acquire new knowledge is a valued skill

By [Stephen Sawchuk](#)

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When it comes to helping new high school graduates succeed Southwest Baptist University's Jodi Meadows knows that sometimes you have to start from scratch. Even some of her top college freshmen, she says, never really had to hit the books in high school. They've had most learning experiences, from group work to quizzes, structured by their teachers, and don't know how to learn things on their own.

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"Generally speaking, most students I encounter have spent almost zero time studying outside of class in high school," said Meadows, an assistant professor of university studies, at the Missouri school. "Well, here, the days of worksheets are over, and super-structured objective assessments are over. We have a different kind of learning here. You want to be able to evaluate, assess, and create, not just recall."

And it's not just limited to classrooms. Futurists increasingly predict a rapidly changing workplace in which employees will be required to update their learning frequently, and on short notice. Employers, they say, will want flexible, adaptable workers who can pick up new content and technologies quickly and efficiently.

So what's K-12's role in getting them there? Well, cognitive scientists are now beginning to stress that producing students for whom such abilities are second nature is not only a challenge of content and pedagogy, but also one of helping students be more aware of how they learn. When faced with new knowledge or an unfamiliar task to master, how should students structure their time in order to practice it? When they get stuck in the middle of a complex problem, what strategies can they deploy to get unstuck? Meadows' and her colleagues' experiences suggest that those strategies are not innate in young learners; instead, they need to be explicitly taught and reinforced.

"None of this is nuclear science, not even close," said John Dunlosky, a professor of psychology at Kent State University in Ohio. "It's not that difficult to train students in these techniques, but you need to have multiple teachers at K-12 teaching them and showing how they're related in their classes, so students get these messages over and over."

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In survey after survey, technology experts and business leaders are skeptical of the ability of the K-12 and higher education systems to evolve quickly enough to respond to the workforce demands of the future. In fact, much of the debate over the future of jobs concerns how much of a role the public education system will even have a part to play in training and retraining workers.

Is such preparation truly the provenance of companies and corporations, as some argue—and will they step up to meet that challenge? Or will such skills be taught informally, as in MOOCs—free open-registration online-training courses—and other modules that today can give almost anyone some degree of skill in computer coding, for example?

Parsing competing theories on the future of work can be wearying. And for today's K-12 educators, it's probably also beside the point. Teachers aren't futurists, and they work within highly structured systems that are generally slow to adopt new practices, and even slower to perfect them.

Nevertheless, of the students that teachers train today, those who are best equipped to learn new skills and technologies—however they're provided—are likely to thrive, and those who don't will probably struggle.

How best to help students gain "lifelong learning" habits in K-12 has been probably the defining debate of U.S. education for the better part of a century, beginning with the progressives in the 1920s. Often it has been reduced to arguments about whether it's better to build student content knowledge systematically and explicitly, versus teaching through "constructivist," inquiry-based activities, often based on student interest.

In truth, learning experts say, the answer is both.

"I think one thing is to give people really strong foundations in core disciplines—reading, writing, scientific literacy—and the chance to practice that independent learning when there is more scaffolding and support around them," said Justin Reich, the executive director of the Massachusetts Institute of Technology's Teaching Systems Lab, which develops interactive teacher-training tools. (Reich also writes an opinion blog hosted on edweek.org.)

"Some people are amazing and become autodidacts, but most others have apprenticed in a formal, structured learning environment that includes core content, information literacy skills, and knowing a little bit about structuring their time, developing social-emotional skills around delaying gratification, being disciplined."

Increasingly, cognitive scientists are focusing on the components about structuring time and learning to be disciplined to learn new things, which have tended to fall through the cracks in the debate.

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## 10 WAYS TO LEARN

Researchers have studied the effectiveness of commonly used study techniques on student achievement. Some, like practice testing and distributed practice, show more promise than others, such as rereading. But students often mistake rereading as an effective way to learn new material.



### 1 ELABORATIVE INTERROGATION

Generating an explanation for why an explicitly stated fact or concept is true.



### 2 SELF-EXPLANATION

Explaining how new information is related to known information, or explaining steps taken during problem solving. Example: Explaining each step of

In general, the idea of thinking about and regulating one's learning falls under the heading of metacognition, and many of the learning techniques the scientists are looking at are fundamentally pretty simple.

Quizzing one's own grasp of Spanish vocabulary using flashcards embodies the technique called practice testing, or devising tests and drills to help learn material.

Using the Cornell method to take notes—generally defined as dividing the paper into columns and putting notes on one side and key words and questions to answer later on the other—illustrates another learning technique, self-explanation, which involves connecting new and prior information together. Explaining each of the steps taken to solve a mathematics problem is another representative example.

And practicing musical scales on the piano on Mondays, drilling finger work on Wednesdays, and committing recital pieces to memory on Fridays would fall under the heading of "interleaved practice"—learning how to effectively spread out various different components of study over time.

In a 2013 paper, Dunlosky and four other cognitive scientists summarized those three techniques and seven others, evaluating the existing empirical research found about their effectiveness. Some, like highlighting texts, aren't particularly useful but are an entry to thinking in a more structured way about learning. Others, like practice testing, seem to be quite effective under a range of conditions.

The catch, researchers say, is that many of those learning techniques aren't routinely emphasized in K-12 schools. They do appear to be more common among literacy and English/language arts teachers, who might, for instance, work with students on how to deploy reading-comprehension strategies. But perhaps the best evidence that they're not widespread comes from the plethora of nonprofit and for-profit organizations, some charging costly fees, that aim to teach students "study skills."

Teachers, meanwhile, tend to build students' knowledge and skills without calling attention to the learning process. For example, a teacher who leads a lesson on multiplication and then prepares matching worksheets for students to complete is engaging them in a cognitive exercise, but without the meta part.

"A lot of the skills involved in regulating your own learning are taken over by the teacher," Dunlosky said. "In K-12, you don't really manage your time. It's all done for you."

That's where Meadows, of Southwest Baptist University, comes in. She helps coordinate a mandatory two-semester course sequence in which college freshman learn how to be in control of their own learning. The course begins with the basics, by having students put all their assignments in a calendar and set

a math problem while solving it.



**3 SUMMARIZATION**  
Writing summaries of various lengths of to-be-learned texts.



**4 HIGHLIGHTING/UNDERLINING**  
Marking potentially important portions of materials to be learned while reading.



**5 KEYWORD MNEMONIC**  
Using keywords and mental imagery to associate verbal information.



**6 IMAGERY FOR TEXT**  
Attempting to form mental images of text materials while reading or listening.



**7 REREADING**  
Restudying texts again after an initial reading.



**8 PRACTICE TESTING**  
Self-testing or taking practice tests on to-be-learned material. Example: using flashcards



**9 DISTRIBUTED PRACTICE**  
Implementing a schedule of practice that spreads out study activities over time, rather than cramming in one night.



**10 INTERLEAVED PRACTICE**  
Mixing different kinds of problems or materials over several study sessions or within a single study session. Example: Solving fraction problems that involve multiplying and division, rather than just one skill.

SOURCE: "Improving Students' Learning With Effective Learning Techniques," Psychological Science in the Public Interest

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timelines and milestones for completing them, and grows more sophisticated over time as students learn how to evaluate arguments, conduct research, and study independently.

The study of metacognition is still fairly young, dating from the 1970s, and less research has been conducted on workplace metacognition than in formal education. So it's difficult to know whether the study techniques that are learned and used in an academic setting will transfer to the workplace. But for Meadows, the connections are clear.

"We talk about how degrees relate to jobs these days, and how a degree is not a guarantee of a job anymore," she said of her students. "I ask them, 'What's going to put you at the top of the stack?' And then they begin to talk about things they've never connected with education: work ethic, working well with others. In essence, you are learning to be a particular way in the world—a question-asker, how to manage yourself, and how to be a solid decisionmaker."

That doesn't mean that students are necessarily receptive. One problem, Dunlosky said, is that students mistakenly think they know how to study when they really don't. They may think that merely rereading a chapter or two will suffice. (Rereading is not one of the more effective learning techniques Dunlosky and his team studied.)

More colleges should consider granting credit to students who agree to practice and use some of these techniques in an introductory course and see how well they work, he suggests.

And some warn that there's a ceiling, too, to what training in the techniques can accomplish. No amount of metacognition will help someone to become an accounting whiz if he or she doesn't have the mathematical preparation, the experts point out.

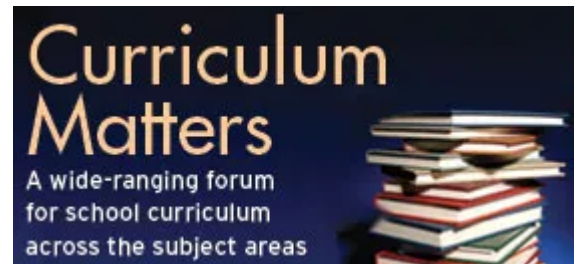
"A little bit of modeling and practice is doubtless going to be helpful, but there's an upper limit," said Daniel Willingham, a cognitive scientist and professor of psychology at the University of Virginia. "The job titles may not exist yet, but in 2020, people are still going to need to do mathematics, to be able to read. The cognitive processes that go into those jobs are probably not that different than what we are looking at today."

To be sure, no one knows precisely the recipe for producing the most prepared, adaptable workforce. But at the very least, to learn how to learn is a gift. And it may just be one of the puzzle pieces to navigating an uncertain future.

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