Learning About Learning: What Every New Teacher Needs to Know

Executive Summary

Why this study?

Every year about 190,000 teacher candidates graduate from traditional teacher preparation programs believing they are ready to begin the relentlessly demanding career of teaching. Each of these aspiring teachers will have taken at least one education psychology course or instructional methods course (usually both) designed to teach them how children learn and how to create lessons whose content their students will remember. These topics then will be revisited in much of their other coursework. No other subjects will receive as much attention during teacher training as those that purportedly focus on how students learn.

This report contends that textbooks used in this coursework neglect to teach what we know about how students learn despite its central importance in training. Compelling cognitive research that meets scientific standards about how to teach for understanding and retention barely gets a mention in many texts, while anecdotal information is dressed up as science. Theories du jour and debunked notions are being passed on to new teachers as knowledge and best practice.

Put simply, publishers and authors are failing both aspiring teachers and the teaching profession. They are not ensuring that the core texts designed to produce our next generation of teachers are giving candidates the most fundamental information needed to make learning "stick." The transfer of knowledge — from researchers to publishers to teacher educators to aspiring teachers — is not happening while the need to impart it has never been more urgent.

In practice, what does that mean for aspiring teachers?

First, they're wasting a lot of money. Each teacher candidate likely will buy at least one often- pricey book for their ed psych course and another for their methods course, leading to upwards of $40 million in total spending by each year's crop of new teachers.[1]

But far more important, when teachers aren't trained well, they try to learn on the job — by guessing in the classroom. Being unprepared can overwhelm and even defeat novice teachers at the moment they're most vulnerable. Students are the losers.

The antidote, of course, is that teacher candidates should learn **research-proven instructional strategies** in their textbooks and practice them — again and again — during their training.

This report examines some of the most widely used textbooks in teacher preparation programs today. Specifically, it looks for the degree to which teacher candidates are taught instructional strategies that decades of research confirm can be the most effective.

How were these strategies determined?

In *Organizing Instruction and Study to Improve Student Learning: A Practice Guide*, the Institute of Education Sciences (IES), the research arm of the U.S. Department of Education, identified proven practices that promote learning for all students, regardless of grade or subject, and that are especially potent with struggling students. Six practices stand out for the research behind them. There is little debate among scholars about the effectiveness of these six strategies:

What are the six strategies that work?

The first two help students take in new information:

1. **Pairing graphics with words.**
   Young or old, all of us receive information through two primary pathways — auditory (for the spoken word) and visual (for the written word and graphic or pictorial representation). Student learning increases when teachers convey new material through both.
2. **Linking abstract concepts with concrete representations.**
   Teachers should present tangible examples that illuminate overarching ideas and also explain how the examples and big ideas connect.

The second two ensure that students connect information to deepen their understanding:

3. **Posing probing questions.**
   Asking students "why," "how," "what if," and "how do you know" requires them to clarify and link their knowledge of key ideas.
4. **Repeatedly alternating problems with their solutions provided and problems that students must solve.**
   Explanations accompanying solved problems help students comprehend underlying principles, taking them beyond the mechanics of problem solving.

The final two help students remember what they learned:

5. **Distributing practice.**
   Students should practice material several times after learning it, with each practice or review separated by weeks and even months.
6. **Assessing to boost retention.**
   Beyond the value of formative assessment (to help a teacher decide what to teach) and summative assessment (to determine what students have learned), assessments that require students to recall material help information "stick."

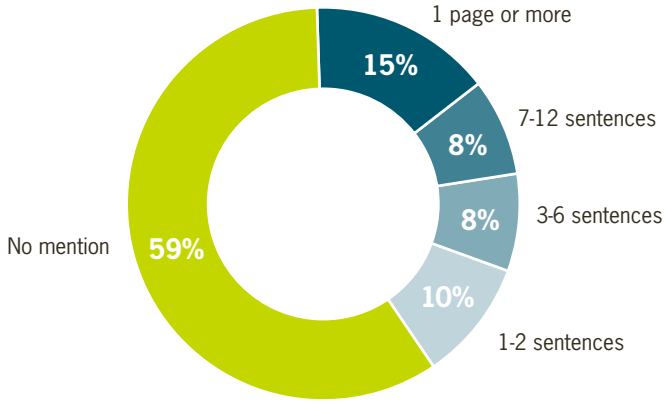
What's evident in textbooks and in teacher prep coursework?

To assess how well teachers are trained in these effective and well-supported instructional methods, we focused on reviewing course textbooks, though we also looked at class discussion and assignments and clinical practice associated with student teaching. Textbooks underpin most teacher preparation coursework, and they provide insights into the instructional approaches used by teacher educators. Specifically, we reviewed 48 relevant texts used in ed psych and general and subject-specific methods courses in 48 elementary and secondary teacher preparation programs.

The textbooks teach instructional topics, but the lack of emphasis on cognitive strategies that are most likely to be effective in the classroom is hard to overstate.

- None of the textbooks used in the sample accurately describes all six fundamental instructional strategies. At most, only two of the six strategies are covered in any particular text.
- When textbooks do mention the strategies (allowing for a broad range of terminology and descriptions), the discussion can be as brief as 1-2 sentences in a text that is typically several hundred pages in length.

Figure A. Frequency and length of mentions of any of the six fundamental instructional strategies (n=288)



Nearly 60% of the 288 mentions of the six strategies that the sample's textbooks should contain (if each textbook addressed all strategies) are simply not found. If a mention is found, in almost all cases it is much shorter than what's needed to adequately explain a strategy.

- Only one strategy, ***posing probing questions***, is found frequently in textbooks.
- Textbooks are detached from the field's bedrock research as identified by IES, indeed from reliable research in general. On average, among pages of references to sources of relatively little merit, textbooks cite only one of the seminal studies highlighted in *Organizing Instruction and Study to Improve Student Learning*.
- Instruction in the strategies also is virtually non-existent in coursework and clinical practice in programs in the sample. Again, ***posing probing questions*** is the only strategy in which candidates are prepared to any extent.

If teacher candidates aren't being taught the research-proven and workable practices that help students learn new content, they will flounder when they try to make learning last.

Important next steps for textbook authors and publishers, teacher prep programs, and state agencies are identified in our recommendations. All recommendations have a central theme: that teacher education needs to draw from the bedrock research in the field of learning.

Recommendations address how authors, publishers, educators, and regulators can ensure that candidates have the opportunity to learn about the fundamental instructional strategies in textbooks, practice the strategies in coursework, and demonstrate mastery of knowledge about the strategies in licensing tests.

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