Are Learning and Understanding Impaired by Memorization?

Cornelius N. Grove, Ed.D.
Independent ethnologist of education

This paper is based on research Grove carried out for *The Drive to Learn* (2017), *A Mirror for Americans* (2020), and his forthcoming book, *Misaligned Minds: How Cultural Differences Complicate Classrooms*.

Our fellow educators in the United Kingdom, like us, are dealing with the children of immigrants. A few years ago, a state-supported secondary school in London included among its students a large number of Muslims, almost all of whom were receiving two educations: one at this state school and the other, termed "supplementary," during afternoons and weekends at local mosques and Muslim organizations.[1] There they were taught according to the Muslim tradition, mastering the Arabic language (including rules of pronunciation elegance) and learning the Qur'an.

The leaders of the state-supported school invited scholars to carry out research into the effects on the Muslim students of simultaneously receiving Western and Muslim educations. The school leaders requested this project because "they had noticed that the Muslim students were doing very well at school and wondered if there was something in their supplementary education that brought about their high academic performance." They also were "wondering if there was something in supplementary Islamic education that could help *all* students perform better."[2]

The scholars' research design was intended not just to extract information from the Muslim youth, but to "create conditions in which they could reflect on, discuss, and articulate their educational experiences in the two settings," mainstream Western and traditional Muslim.[3] Girls and boys, ages 15–17, participated. Here's what this research revealed:

> The students articulated what they conceived to be the positive impacts of their memorization as Muslims on their education within the mainstream school setting. For many, memorization was a *skill* that had transferable application. Most said that their experience of memorization in Islamic education had benefitted them in school, particularly when they had to learn things in subjects like science, mathematics, and modern foreign languages. However, many of the Muslims found it difficult to tell how their mainstream education had impacted their Islamic education.[4]

Most K–12 educators in the U.S. and U.K. are aware that a variety of views exist about memorization, but by a wide majority, they agree that memorization is worse than useless – not to mention difficult, time-consuming, and terminally boring.

How can the bad reputation of memorization be accounted for, especially when you consider that across centuries of Western educational tradition, memorization played a key pedagogical role. It wasn't abandoned in the U.K. and U.S. until the middle of the 1900s.

Memorization distresses us because it cuts against the grain of individualism. Think about it: Instead of drawing on one's internal I'll-do-it-my-way vibe, memorization depends on an external source, often very old, and requires precise mastery of a pre-determined sequence of words. Such an effortful, I'll-do-it-*your*-way exercise almost seems intended to be obnoxious to individualists. During

recent centuries, the cultures of many Western societies have been evolving towards ever more individualistic values; some would argue that individualism triumphed during the middle of the 1900s. A casualty on the losing side was memorization, now branded as incompatible with understanding.

Surprisingly, educators in some non-Western societies *agree* with those of us in the West that rote learning achieves merely an ability to regurgitate facts, not to understand. This is the view in East Asia (China, Japan, Korea, Taiwan), as revealed by decades of research into children's learning there.[5]

Nevertheless, Western educators have long believed that East Asian students rote-memorize constantly. Why? Because students there are commonly observed going over and over *and over* the material to be learned, suggesting that they're using a "surface approach" that yields memorization by rote but can never yield the deep understanding that enables long-term retention and application.

If it's true that East Asian students have been routinely indulging in worse-than-useless rote memorization, then we need to explain the fact that, since the mid-1960s on the international comparative tests, East Asian students have *always* been among the top scorers, while their American peers have *always* languished among the mid-range scorers." (For example, among 15-year-olds on the 2022 Mathematics PISA, the top nations were, in order: Singapore, Macau, Taiwan, Hong Kong, Japan, and South Korea; the U.S. ranked 34th.[6]) Hearing this, many people reply dismissively that the East Asians have always been superior at memorizing test answers. Maybe. On the other hand, consider the experience of journalist Amanda Ripley, who at age 37 arranged to take a full-scale PISA test:

> After I arrived at a K Street office in Washington, D.C., worried because I hadn't taken a test in 15 years, a woman showed me to a desk and laid out a pencil, a calculator, and a test booklet, then read the instructions aloud. For two hours, I answered 61 math, reading, and science questions.
>
> Several questions asked me to write my opinion, most odd on a standardized test. Other questions reminded me of problems I'd encountered as an adult – having to decipher the fine print of a healthcare policy or comparing the fees of checking accounts offered by competing banks. All the math formulas were provided, as was the value of pi [3.14159]. It seemed more like a test of life skills than school skills! I had to really *think* about my answers.
>
> One reading question featured a bland company flu-shot notice that was just like a real HR flyer! Claiming that the flyer had been designed by "Fiona," the question asked was this:
>
> > Fiona wanted the style of this information sheet to be friendly and encouraging. Do you think she succeeded? Explain your answer by referring in detail to the layout, style of writing, pictures, or other graphics.[7]

In the context of this paper's discussion, Amanda Ripley's conclusion is particularly significant:

> *PISA was not just a test of facts. It was a test of the ability to do something useful with facts. I was convinced that it measured critical thinking*.[8]

Welcome to what scholars formerly called "the paradox of the Asian learner," a key aspect of which is this: Although East Asian students *look* exactly like rote learners deprived of understanding, their learning consistently has proven superior to that of their American peers. This paradox and related mysteries intrigued researchers in a variety of disciplines to such an extent that, for more than 40 years (the 1970s through the 2010s), hundreds of scholars headed to East Asia to seek answers and the reasons why. Of the many surprising findings they came away with, one was simply this:

East Asian students are *not* rote-memorizing.

Think back to a time, probably but not necessarily during your student days, when for some reason you were committed to *understanding* a challenging topic or even *mastering* it, not just gaining proficiency in it. If researchers had been observing you during the many hours that you devoted to attaining your goal, how would they describe your actions? I'm guessing that among their descriptions would be something like, "This student went over and over the material to be learned." But your intention was *not* to rote-memorize. Neither is rote memorization the intention of East Asians.

Westerners who were familiar with East Asian students' study habits had come up with erroneous conclusions about both their intentions and procedures and the relation of memorization to understanding. Succinctly stated, Westerners had concluded that (a) if a learner is trying to *understand* material, memorizing will thwart their efforts, and (b) if a learner is trying to *memorize* material, understanding will not result (though the ability to regurgitate it will). In this way, the mistaken belief had arisen in the West that memorization and understanding are mutually exclusive objectives.

Meanwhile, more and more researchers were ceasing to talk about "memorizing," and instead were preferring the term "repetitive learning." Their decisive "ah-ha" was that, *for East Asians, striving to understand aids memorization, and striving to memorize aids understanding*. In short:

Constant repetition is the path to *both* understanding and memorization.

Intense, *concentrated repetition over a short timespan* gets a student to rote-memorization, the intention being to accurately reproduce the material soon with little concern for its meaning or for sustained recall. This strategy came to be called "mechanical memorization." In some situations it's appropriate. Just like you and me during our student days, East Asians occasionally realize that a teacher will give a test tomorrow morning that will include material they haven't yet learned. So what's a hapless student gonna do? Rote-memorize deep into the night, of course!

However, *repetition now and again over an extended timespan* eventually gets a student to understanding, the objective being to deeply explore the material's meaning and the possibility of grasping it in new ways. Do you and I have any experience that helps us relate to this? Very likely. If you, like me, have ever had a speaking role in a theatrical production, even as a student, join me in recalling our process in preparing for that role. We began by going over and over the script, resulting in our being able to repeat our lines pretty well from memory. That step merged with our pondering of the deeper meanings in the script, its possible interpretations, and our character's motivations and feelings. Additional repetition enabled us to "become" our character. And when confidently "in role" on stage, we might even have introduced interpretive flourishes based on our deep understanding of the script.

Here's how one student described repetitive learning to researchers:

> I read in detail section by section. If I find any difficulties, I try my best to solve the problem before I go into the next section. If you don't memorize important ideas when you come across them, then you'll be stuck when you go on. You must understand, memorize, and then go on – understand, memorize, and then go on – understand, memorize, and then go on. That is my way of studying.[9]

Another student put it this way:

> It's not just repeating. Each time I go over it, I have a new idea of understanding. I understand it better.[10]

This approach came to be called "memorizing with understanding" as well as "meaningful memorization." The researchers identified it as a key element in the solution to the paradox of the Asian learner because *the repetitive strategy of Asian learners is intended to both memorize the material and thoroughly understand it*. Both objectives are attained via repeated readings.

What accounts for the widespread use of this repetitive strategy in Asian societies? Several scholars came to believe that it's because the written language of most Asian societies is character-based. The only way youngsters in those societies can master their character-based language is through seemingly endless repetition. Yes, the initial goal of all that repetition is rote memorization. But memorization is not the end; it's the means to the end.

And that approach to studying, strongly internalized as an East Asian youngster learns characters, is transferred to the learning of all sorts of topics in schools. It's a major part of the explanation for the academic successes of East Asians, on display for over half a century on the international comparative tests. Academic success is totally dependent on the ability of memory to develop accurate, enduring traces of symbolic material. Memory alone will never yield a high GPA. But when combined with understanding, memory is the support system for cognitive activities such as computation, analysis, application, evaluation, knowledge expansion and, yes, critical thinking.

Finally, let's remind ourselves that Asians' quest for thorough understanding comes with a personal cost. They expect to work their way to understanding *gradually*. Doing so inevitably requires effort, determination, perseverance, and much burning of the midnight oil.

In contrast, American students expect to gain understanding rapidly. When they think they've understood, they're prone to suggest they "got" it by means of their inborn insight or intuition. ("It finally just came to me!") This belief arises from Americans' assumptions about the impact of the unique natural abilities with which each human being supposedly is born.[11]

This paper began with a discussion of Muslim students' learning. Let's return to that topic. You might have heard that the young children of devout Muslim parents are obliged to try to commit all 114 chapters of the Qur'an to memory – *rote* memory. Memorizing some of it is admirable; memorizing *all* of it yields a major extended family celebration. If you dug deeper, you might have discovered that (a) the Qur'an is written in 7th century classical Arabic, which now is virtually no one's day-to-day language; and (b) recitation of the Qur'an requires one to eloquently pronounce classical Arabic just like those 7th century Arabians did. In short, Muslim youngsters are expected to memorize an entire book in a language neither they nor anyone known to them understands.[12]

Initially, memorization of the Qur'an was intended to preserve it in its exact form, not just the words and their sequence but also their eloquent pronunciation, as revealed to Mohammed.[13] The intention of preserving the original Qur'an continues today, not as an end in itself but as a means to an end. Among Muslims, memorization is viewed as the first step in understanding the Qur'an. Its

purpose is to ensure that sacred knowledge is passed on to each new generation in its original form so that, thereafter, Muslim youth can gradually come to understand it as their lives progress.

Muslim English as a Foreign Language educators see memorization as a strategy that's mostly helpful in the early stages of learning, when it mentally embeds foundational processes and facts, making it available for retrieval and gradual transformation into automatic responses. They stress that learners *must* gradually shift their emphasis from memorizing to understanding.[14]

Almost a millennium ago, the Sufi theologian al-Ghazali (1065–1111) explained it this way:

> The creed ought to be taught to a boy in the earliest childhood, so that he may hold it absolutely in memory. Thereafter, the meaning of it will keep gradually unfolding itself to him, point by point, as he grows older.[15]

I'm going to leave you to ponder two related issues, after which I'll briefly share my own perspective.

1. *What, precisely, is the meaning of "to memorize"?* If you ask me to memorize Lincoln's Gettysburg Address, I'll realize that success means reciting it word-for-word, unaided, from "Four score and seven years ago…" to "…shall not perish from the earth." Is that meaning of "to memorize" identical to what a Chinese student means by, "If you don't memorize important ideas when you come across them, you'll be stuck when you go on." My hunch is that the two are *not* identical. That is, I suspect that Asian students infrequently memorize long stretches of material word-for-word.

2. *What, precisely, are the mental processes American educators have in mind when they refer to students' "attaining understanding"*? Clearly, they do not expect memorization to play a role. The term "repetitive learning" was coined by researchers investigating *Asian* students' learning. My question is, *how are American students believed to learn?* How do they come to understand something, then embed that understanding in their mind so it can be retrieved and used in the future?

Recently I came across *How Children Learn*, published in 2004 by the U.S. National Academy of Sciences. It's a goldmine of methods for the classroom teaching of younger students. Within its 632 pages, homework is mentioned in passing five times. Memorization is mentioned in passing 12 times. Repetition is mentioned in passing 23 times, including this: "Supporting conceptual change in students requires repeated efforts to strengthen the new conception so that it becomes dominant." Question: Who makes those "repeated efforts to strengthen the new conception?" It's the classroom teacher! The perspective of *How Children Learn* is that students' understanding is mostly teacher-mediated and classroom based, not the result of students' effortful private study.[16]

Here's my perspective. The century-long trend in American education has been to gradually lower expectations regarding students' contributions to their own learning, especially outside class, and simultaneously raise expectations for the degree to which teachers, during lessons, take responsibility for students' learning. The foundational explanation for this is Americans' assumption that students do well or poorly academically primarily due to their inborn level of intelligence, not due to their effort. In most Americans' conception of how students learn, only a minor role is played by the possibility that students need to devote *lengthy stretches of their own personal time and effort* to gaining and

internalizing understanding of academic subjects. So if effort is of minor importance while enjoyment of the learning process is of major importance, memorization can – and should – be discarded.

Most Americans encourage students and their own children to finish their homework. But do Americans encourage them to attain full understanding by studying into the night? Not so much.

Suggested citation: Grove, Cornelius N. (2025). Are Learning and Understanding Impaired by Memorization? Academia.edu.
Note: This paper was slightly revised and resubmitted to Academia.edu in early July 2025.

Bibliography

Berglund, Jenny, & Bill Gent (2018). Memorization and focus: Important transferables between supplementary Islamic education and mainstream schooling. *Journal of Religious Education, 66*, 125–38.

Biggs, John B. (2001). Teaching across cultures. *Student Motivation: The Culture and Context of Learning*, Farideh Salili, et al., eds., 293–308. Kluwer Academic.

Boyle, Helen N. (2006). Memorization and learning in Islamic schools. *Comparative Education Review, 50* (3), 478–95.

Dahlin, Bo, & David Watkins (2000). The role of repetition in the processes of memorizing and understanding: A comparison of the views of German and Chinese secondary school students in Hong Kong. *British Journal of Educational Psychology, 70* (1), 65–84.

Kember, David (2016a). Understanding and teaching the Chinese learner: Resolving the paradox of the Chinese learner. *The Psychology of Asian Learners*, R.B. King & A.B.I. Bernardo, eds., Chapter 11. Springer Singapore.

Kember, David (2016b). Why do Chinese students out-perform those from the West? Do approaches to learning contribute to the explanation? *Cogent Education, 3* (1), 1248187, 1–15.

Kember, David, & Lyn Gow (1990). *Cultural specificity of approaches to study*. Paper presented at 6th annual conference of the Hong Kong Educational Research Association. Reprinted in *British Journal of Educational Psychology, 60*, 356–363.

Li, Jin (2012). *Cultural Foundations of Learning: East and West*. Cambridge University Press.

Marton, Ference, Gloria Dall'Alba, & Tse Lai Kun (1996). Memorizing and understanding: The keys to the paradox? *The Chinese Learner: Cultural, Psychological, and Contextual Influences*, D.A. Watkins & J.B. Biggs, eds. Comparative Education Research Center / Australian Council for Educational Research.

Nasrollahi-Mouziraji, Alieh, & Atefeh Nasrollahi-Mouziraji (2015). Memorization makes progress. *Theory and Practice in Language Studies, 5* (4), 870–74.

National Research Council (2004). *How Children Learn: History, Mathematics, and Science in the Classroom*, M.S. Donovan & J.D. Bransford, eds. National Academies Press.

Pilotti, Maura, Halah Alkuhayli, & Runna Al Ghazo (2022). Memorization practice and academic success in Saudi undergraduate students. *Language and Teaching in Higher Education: Gulf Perspectives, 18* (1), 19–31.

Ripley, Amanda (2013). *The Smartest Kids in the World: And How They Got that Way*. Simon & Schuster.

Stewart, Rory (2004). *The Places in Between*. Harcourt.

Wagner, Daniel A. (1983). Rediscovering rote: Some cognitive and pedagogical preliminaries. *Human Assessment and Cultural Factors*, S. Irvine & J.W. Berry, eds., 179–90. Plenum.

Watkins, David (2000). Learning and teaching: A cross-cultural perspective. *School Leadership & Management, 20* (2), 161–173.

Wu, Yi-Jhen, Claus H. Carstensen, & Jihyun Lee (2019). A new perspective on memorization practices among East Asian students based on PISA 2012. *Educational Psychology, 40* (5), 1–20.

[1] Berglund & Gent (2018).

[2] Berglund & Gent (2018), 130.

[3] Berglund & Gent (2018), 131.

[4] Berglund & Gent (2018), 133; edited and shortened, italics in original. Regarding the students' views on how their mainstream education had impacted their Islamic learning, some suggested that learning a modern foreign language helped them learn Arabic. Others mentioned benefits such as learning about other belief systems, teamwork/working with other people, increased tolerance, and building up a good self-image (133–34).

[5] Education in East Asia, especially in China and Japan, has been subjected to sustained research scrutiny since the early 1970s. Researchers from all over the world became involved, eventually including some from East Asia itself. Regarding no other world region has education received so much international scholarly attention; I estimate that over 1000 journal articles and books have emerged as a result. I became familiar with much of this research during my writing of *How Other Children Learn* (2017) and *A Mirror for Americans* (2020). For these paragraphs, I have drawn on (a) Kember (2016a); (b) Kember (2016b); Dahlin & Watkins (2000); Marton et al. (1996); Biggs (2001); Pilotti et al. (2022); Watkins (2000); and perhaps the most compact yet comprehensive overviews, Li (2012), 73–76; and Wu et al. (2019).

[6] Data from nces.ed.gov/surveys/pisa/pisa2022/#/mathematics/international-comparisons. PISA is the acronym for Program on International Student Assessment. On the internet you can find a massive amount of information about the international tests. An excellent place to begin is on our government's website nces.ed.gov/surveys/international/find-tables.asp. Near the top of that webpage, you'll find the acronyms of eight international comparative tests, one of which is PISA. This is your gateway to current and historical data regarding each of the international tests.

[7] Ripley (2013), 19–24; edited excerpts, italics in the original. Be sure to notice that a calculator was supplied to the test taker, and that the value of π [pi: 3.14159] also was supplied, i.e., *test-takers were not expected to have memorized it.*

[8] Ripley (2013), 23–24; excerpts, italics added.

[9] Kember & Gow (1990), n.p. Found in Kember (2016a), 175.

[10] Li (2012), 138.

[11] The historical development of the belief in the powers of intuition and insight is traced in my 2013 book, *The Aptitude Myth: How an Ancient Belief Came to Undermine Children's Learning Today*. Visit theaptitudemyth.info.

[12] British writer Rory Stewart walked across Afghanistan – *not* along paved roads – during early 2002, hiking daily from one isolated village to the next. He reports this exchange with a 12-year-old named "Sheikh" who had claimed that the Prophet identified dogs as unclean animals. Stewart speaks first:

> "Where is that in the Koran?"
>
> "I can't remember exactly," said Sheikh, "but it's there."
>
> "I thought that you had memorized the entire Koran."
>
> "I have memorized it," Sheikh replied. "I can recite it in Arabic from end to end – more than one hundred thousand words. But I don't speak Arabic, so I don't understand precisely where the individual pieces are." Stewart (2004), 130.

[13] Boyle (2006), 487–88.

[14] Nasrollahi-Mouziraji & Nasrollahi-Mouziraji (2015), 873.

[15] Boyle, *ibid.*, 488; she cites Wagner (1983), n.p.

[16] National Research Council (2004); the quote is from page 571. A subsection of this book entitled "Learning with Understanding" (559–60), which advocates "actually *requiring* students to think more deeply about the ways in which they have come to understand science concepts," focuses solely on teacher-mediated learning in the classroom.