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The Importance of Prior Knowledge:

Studies You Need to Know About

InnerDrive



THE IMPORTANCE OF PRIOR KNOWLEDGE

By InnerDrive

"*The most important single factor influencing learning is what the learner already knows.*" This famous observation from educational psychologist David Ausubel (1968) highlights the importance of prior knowledge, which has a profound effect on how students experience school. It impacts their rate of learning, their level of comprehension and their ability to develop critical thinking skills.

1. PRIOR KNOWLEDGE AND LEARNING

In a huge meta-analysis of almost 500 studies that involved over 125,000 students, researchers found that prior knowledge played a big role in the rate of student learning (Simonsmeier et al., 2021). On average, they found that the more students know, the faster they learn.

This is supported by another study (Witherby & Carpenter, 2021), which found:

- Students with greater prior knowledge learned and recalled more of the new information. Importantly, this advantage was topic-specific: prior knowledge only enhanced learning when it was relevant to the topic being studied.
- Students with greater prior knowledge also judged their learning of the new information more positively.
- Prior knowledge was associated with greater curiosity. The more curious students were about the new information, the more they learned.

2. PRIOR KNOWLEDGE AND COMPREHENSION

In a seminal study, Recht and Leslie (1988) investigated how much prior knowledge matters for reading comprehension. They divided students

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into four groups based on two factors: their general reading ability and their existing knowledge of baseball (prior knowledge). This created four groups of participants:

- High reading ability/High baseball knowledge
- High reading ability/Low baseball knowledge
- Low reading ability/High baseball knowledge
- Low reading ability/Low baseball knowledge.

The students were asked to read a passage about a baseball game and their understanding of the text was then assessed. Unsurprisingly, the high-ability readers who knew a lot about baseball performed best and those with low reading ability and low baseball knowledge did the worst. But fascinatingly, weaker readers with high baseball knowledge did better than stronger readers with no baseball knowledge.

The study therefore provides a powerful demonstration of the role that relevant background knowledge can play in comprehension. This is because words do not exist in isolation. Reading is not simply a mechanical process of decoding words. It is an active process of making meaning. To make meaning, students must connect what they are reading to what they already know. This means that knowledge is not a separate part of literacy; it is a foundational part of it.

3. PRIOR KNOWLEDGE AND CRITICAL THINKING

A key feature of creative thinking is that it involves the combination of developing something that is both new and useful (Runco and Jaeger, 2012). Therefore, it is almost impossible to be creative without knowing what has come before. Creativity is built on a foundation of knowledge. The two cannot be separated. As one of the leading researchers commented, "*attempts to teach thinking skills without a strong base of factual knowledge do not promote problem-solving ability*" (Bransford et al., 2000).

4. PRIOR KNOWLEDGE AND THE MATTHEW EFFECT

The Matthew Effect describes how small initial differences in knowledge between learners can grow larger over time (Stanovich, 1986). Students who begin with more knowledge may find it easier to acquire further

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knowledge because what they already know helps them understand and remember new information. They can therefore pull progressively further ahead of students who start with less knowledge. Unless that foundational knowledge is explicitly taught, we run the risk of creating a 'rich-get-richer effect', where formal education benefits those with a firmer starting point.

KEY IMPLICATIONS

1. Prior Knowledge and Teaching

Schemas are mental structures that help us organise and make sense of information stored in long-term memory (Sweller et al., 1998). The complexity of these mental models varies depending on how much knowledge someone has in a particular domain. As students with low prior knowledge have smaller and less complex schemas compared to students with high prior knowledge, they may benefit from a different type of teaching style. The former will benefit from Explicit Instruction, whereas the latter may benefit from a more independent task, as they already have an internal framework that they can draw on (Kirschner et al., 2006). This is known as the Expert Reversal Effect (Kalyuga et al., 2003).

2. Use Strategies That Cement Knowledge Effectively

Cognitive science has given us a clear indication of what can help cement knowledge in long-term memory. Two such strategies are Spacing and Interleaving. Spacing involves spreading out learning over time rather than cramming it into a single session. Research suggests that it can enhance long-term retention and reduce forgetting (Rohrer & Taylor, 2007). As students become more secure in their understanding, the intervals between practice sessions can gradually increase.

Similar, but different to Spacing, is Interleaving. This involves mixing different concepts during practice instead of covering them one at a time. Research suggests that it can improve long-term retention and transfer of knowledge by allowing students to better compare and distinguish between concepts (Firth et al., 2021). This strategy seems to be particularly beneficial for those with stronger prior knowledge, as they know more about the different concepts they are contrasting (Klimovich and Richter, 2025).

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FINAL THOUGHTS

Prior knowledge is one of the most important foundations upon which future learning is built. Students with strong background knowledge can often make connections and understand new information more easily. They are also more likely to be able to think critically and creatively about the content. For those with less prior knowledge, this can create a cycle that makes learning increasingly challenging. By explicitly building foundational knowledge and revisiting key concepts, teachers can help close these gaps and give all students the knowledge they need to become increasingly confident and independent learners.

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ADDITIONAL RESOURCES: BLOGS AND PODCASTS

Podcast: 7. Nick Gibb's Three Most Influential Books and Studies – The Science of Learning – Apple Podcasts / Spotify Podcasts

Podcast: 2. AI in Education with Daisy Christodoulou – The Science of Learning – Apple Podcasts / Spotify Podcasts

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