ALEKS Innovations: Shorter, Smarter Knowledge Checks

This summary highlights findings from our published research on student learning and knowledge retention in ALEKS. These findings directly informed updates to the ALEKS platform, making it even more efficient and effective.

✓ Research Highlights:

- **Content on the "edge" of a student's current knowledge decays at a faster rate** than content that is "deeper" in the student's knowledge.
- The **specific characteristics** of problem types have the largest impact on knowledge retention.
- Students perform better with **shorter progress tests** that strategically time questions.
- Advancing through ALEKS provides natural **retrieval practice**, reinforcing learning.

✓ Research-Driven Enhancements to ALEKS:

- **Targeted problem types:** Using a neural network model, we focused progress tests on the problems students are most likely to forget, ensuring the most valuable content is revisited.
- **Shortened progress tests:** By prioritizing key topics, we reduced test length while maintaining effectiveness. As an example, the Initial Knowledge Check now has a maximum of 25 questions instead of 30.
- **Strategic delay:** We incorporated a delay before revisiting certain problem types, based on research showing that spaced retrieval enhances retention.

Meet the ALEKS Applied Research Team

This team of scientists conducts research on how students learn and applies their findings to enhance ALEKS' adaptive AI. Their work drives continuous improvements to the platform, including this study!

About the Research

This work is based on: **Research-Based Updates to an Adaptive Assessment**

Authors: Jeffrey Matayoshi, Eric Cosyn, and Hasan Uzun

Visit the Research Paper

What are Knowledge Checks?

Knowledge Checks are recurring progress assessments in ALEKS that evaluate a student's learning after a set amount of progress. They focus on recently learned topics and serve as a tool for spaced and retrieval practice.

✓ The Results

- Students using the new, shorter Knowledge Checks in ALEKS are **learning 9% more on average!**
- **Shorter progress checks reduce "assessment fatigue,"** keeping students more engaged in their learning.

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How ALEKS Works: Powered by AI, ALEKS adapts in real-time to each student's knowledge, providing personalized learning that evolves with their progress.