Subgoals’ Learning Now, and Then!
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What is Subgoal Learning?

• A strategy used predominantly in STEM fields that helps students deconstruct problem-solving procedures into smaller structural parts [1].
• Subgoals can be constructed by instructors, or students [1, 2], or detected automatically from prior solutions [3].

Why Subgoal Learning is Important?

• Decreases students’ cognitive load.
• Increases students’ ability to transfer learning across contexts.
• Increases students’ performance, and persistence to complete tasks.

Subgoal Example

Subgoal: Loop on the number of sides

Expert-authored Subgoals Vs. Automated Subgoals

Expert-authored subgoals: Several studies showed that students learn best when they generate their own subgoals more than when they are given predefined subgoals [1, 2].

Automated subgoals: Prior work used data-driven methods to generate subgoals with immediate formative feedback on each. Studies found that it improved students’ performance, task completion rate, and intentions to persist in CS [3].

Future Directions

• Examine students’ strategies of problem decomposition into subgoals across domains.
• Explore the impact of subgoal learning when complemented with other effective instructional techniques (e.g. self-explanation prompts).
• Develop tool to assist in problem decomposition.
• Explore the impact of such tool on performance of underrepresented groups.

References