Designing for Metacognition in Cognitive Tutors

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Overview

- Metacognition
- Cognitive tutors
- Help Tutor
- Help Seeking
- Instructional Design Principles
- Studies
- Conclusion
Our Point of View – Weak Accept

- **Positives**
  - Author presents concept/principle, explains concept with a simple real life example.
  - Help seeking module introduces the two main aspects of metacognitive knowledge;
  - Several studies done over the span of few weeks in different schools providing a sufficient amount of evidence to the limitations of the system.
  - The Other Principles section provides insight into principles for future research and improvements of the Help Tutor.
  - The research team admits that the combination of domain and metacognitive learning in one functional tool is a challenge and that this paper should serve as a stepping stone into future research.

- **Negatives**
  - Difficulty of implementing all mentioned principles at the same time in a coherent solution that will teach students how to efficiently seek help while furthering their domain knowledge.
  - Even though the number of conducted studies is enough, there is a need of more statistical data to convince the reader of the presented thesis.
What was done well and suggestions for improvement

- Overall, the paper is clearly written.
- Theories and results are stated explicitly and related back to the Help Tutor system.
- Implementation of Anderson’s and newly introduced principles for cognitive tutors and applying them to a metacognitive model both in theory and in practice.
- The usage of differently colored hints either providing feedback immediately after errors or at different stages of the learning process.
- Even though there is adequate background information provided, there are still terms mentioned with no explanation - ‘metacognitive scaffolding’.