Designing for Metacognition: Applying Cognitive Tutor principles to the tutoring of help seeking

Group E : Meta-Review

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DECISION: WEAK ACCEPT

Introduction:
- The aim is to develop and evaluate a set of empirically-based design guidelines for metacognitive tutoring in ITS
- Used Anderson's principles for cognitive tutoring and further expanded them
- Help-seeking in Cognitive Tutors was introduced with the help-tutor agent
- Teach metacognitive skills: mainly help-seeking

Method:
- Evaluate Anderson's principles
- Experiment on Help tutor: 4 complete studies, 1 on-going study
- Formulate the new principles: 10 principles sort into three groups
  - ✓ Goals, describe the design of appropriate metacognition learning objective for ITS
  - ✓ Instruction, discuss the design of the instructional means, interaction style, pedagogy to be used
  - ✓ Assessment, discuss the evaluation of the metacognitive tutoring

Pros:
- Clear goal : Aim to design the principles
- Justification of work: There is a lack of guidelines available before their work
- Evaluation Strategy: Will use the help tutor
- Implications (short term and long term):
  - ✓ Help tutor to improve the help seeking behaviour
  - ✓ Can be applied to other environments in future
  - ✓ Improve learning at the domain level
- Methodology: Used Cognitive tutor as the basis
- Evidence that supports the principles: Studies 1 to 5
- Clear how help tutor works: It works as an Add-on in the Cognitive Tutor environment, as an embedded help seeking model.
- Clear help tutor results: mixed outcomes
- Propose improvements: Both in help tutor and in principles
- Conclusions Supported by data: Improvement and evaluation, can help as a baseline.

Cons:
- The evaluation of the principles presented is rather scattered.
- The new principles are partially supported due to incomplete results of study 5.
- Some methodologies used might not be clear to non-experts.
- The conclusion of the paper is written as a summary but does not states any result of their work. It rather states that the work is "incomplete"