Metacognition

Metacognition is “...thinking about the contents and processes of one's mind.” (Winne & Azevedo, 2014, p. 126). Metacognitive awareness as a function of metacognitive regulation is a strong predictor of academic performance and achievement as it increases students' ability to transfer their learning to new contexts and tasks and continually become more strategic learners (Bransford, Brown, & Cocking, 2000; Azevedo, R. & Cromley, J. G., 2004; Schraw, 2008; Tobias & Everson, 2009).

Design recommendations focus on supporting and scaffolding metacognitive awareness and self regulation to help students be strategic learners as they become more aware of the status of their knowing, understanding, and executing, as well as increase in self-regulated learning skill and will by accepting greater accountability for their learning processes and outcomes (Lee, Lim, & Grabowski, 2010; Pintrich, 2004; Pintrich & Groot, 1990; Zimmerman, 1990).

LEARNER IMPACTS
- Behavior
- Self-regulation
- Motivation

CAPABILITIES
- Assessment: Short answer constructed response
- Cognitive Tools: Peer review
- Cognitive Tools: Planning/outlining

SAMPLE DESIGN IMPLEMENTATIONS
- Robust Technology: Adaptive scaffolds
- Simple Technology: Notifications/prompts
- Content Support: Instruction/practice monitoring learning
<table>
<thead>
<tr>
<th>Principle Criteria</th>
<th>Definition</th>
<th>Exploration</th>
<th>Consideration</th>
<th>Not Applicable</th>
<th>Total Points</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Model</strong></td>
<td>Supports knowledge development in all of these forms: declarative, procedural, conditional</td>
<td>Supports knowledge development in two of these forms: declarative, procedural, conditional</td>
<td>Supports knowledge development in one of these forms: declarative, procedural, conditional</td>
<td>Supports knowledge development in none of these forms: declarative, procedural, conditional</td>
<td>= _____</td>
</tr>
<tr>
<td><strong>Design</strong></td>
<td>Supports and scaffolds metacognition by means of four or more of: realistic feedback, constructive feedback, suitable task difficulty, task autonomy, outcome attribution</td>
<td>Supports metacognition by means of three or more of: realistic feedback, constructive feedback, suitable task difficulty, task autonomy, outcome attribution</td>
<td>Supports metacognition by means of two or more of: realistic feedback, constructive feedback, suitable task difficulty, task autonomy, outcome attribution</td>
<td>Supports metacognition by means of one or fewer of: realistic feedback, constructive feedback, suitable task difficulty, task autonomy, outcome attribution</td>
<td>= _____</td>
</tr>
<tr>
<td><strong>Validation</strong></td>
<td>Triangulates data among at least three sources</td>
<td>Relies upon at least two different data sources</td>
<td>Relies upon a single data source</td>
<td>Metacognition is not measured</td>
<td>= _____</td>
</tr>
</tbody>
</table>