Learning Progressions as a Framework for GER: Possibilities and Cautions

Kim A. Cheek
k.cheek@unf.edu
What are learning progressions?

“description of the successively more sophisticated ways of thinking about a topic that can follow one another as children [learners] investigate a topic over a broad span of time (e.g., 6 to 8 years). They are crucially dependent on instructional practices if they are to occur,” (National Research Council, 2007, p. 219).
Starting Points/Assumptions

Generative Core Ideas

Integrative

Long View

Some “wrong” ideas better than others
5. Scientific Explanation

4: Incomplete Explanation

3: Both 2A and 2B but still no explanation

2A: Sun-Earth-Moon System Knowledge

2B: Observational Knowledge

1: Naïve

<table>
<thead>
<tr>
<th>Topic</th>
<th>What progresses?</th>
<th>Selected paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon cycling</td>
<td>force-dynamic reasoning to systems thinking</td>
<td>Mohan, Chen, &amp; Anderson, 2009</td>
</tr>
<tr>
<td>Reason for seasons</td>
<td>Earth-based vs. space-based perspective-taking</td>
<td>Plummer &amp; Maynard, 2014</td>
</tr>
<tr>
<td>Analogical reasoning about moon phases using physical models</td>
<td>Recognition that elements in model &amp; Earth system are similar to causal reasoning that connects model to Earth system</td>
<td>Rivet &amp; Kastens, 2012</td>
</tr>
</tbody>
</table>
Promises/Opportunities

Standards/Curriculum

Instruction

Assessment

At Scale
Challenges

- Where/how to begin
- Time commitment
- Human capital required
- Multiple research methodologies
- Grain size
- The “messy middle”—coherence vs. fragmentation (Steedle & Shavelson, 2009)