Persistence of student evolution misconceptions throughout a plant systematics course

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Motivation
Undergraduates who have taken evolution courses still harbor evolution misconceptions and misinterpret phylogenetic trees. Assessing student learning of evolution concepts allows informed adjustments in future iterations of the course.

Project Questions
Do lectures on evolution & phylogenetics
- teach students how to read trees?
- address student misconceptions?

Do in-class practice & feedback
- improve tree thinking skills?
- reduce evolution misconceptions?

Study Design
Evolution Module Timeline (2nd half of semester)

Results

<table>
<thead>
<tr>
<th>Interpreting Relationships (N=24)</th>
<th>Detecting Same Topology (N=24)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previously Taught</td>
<td>Correct</td>
</tr>
<tr>
<td>Previously Taught</td>
<td>Correct</td>
</tr>
<tr>
<td>Not Previously Taught</td>
<td>Correct</td>
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</tbody>
</table>

Discussion
- Small N might explain lack of significant correlations
- Varying branch lengths might confuse students
- Rotated trees might confuse students
- Lab report grades may have limited power to reflect effectiveness of pre-lab exercise

Lessons for instruction
- Teach tree thinking & misconceptions earlier on
- Provide regular assessment and feedback

Acknowledgements:
Dr. Kenneth J. Sytsma (project advisor), Dr. Devin Wixon, Delta Internship Cohort Fall 2016, Delta Program

References: