HOW LEARNING OUTCOMES, PERCEPTION AND ASSESSMENT COMPARE

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Learning Outcomes

Identify what the learner will know and be able to do by the end of a course

- Traditionally focused on quantity of learning and not quality
  (Biggs, 1979)

- Teachers often design student learning outcomes (SLO) based on course content
  (Dick et al., 2006)
Learning Outcomes

Identify what the learner will know and be able to do by the end of a course

How do “we” know the learning outcomes have been successfully achieved?
• Earned grades are often the measure used

• Not much literature linking student perception of meeting learning outcomes to the grade earned

• Perceived student learning used as a tool to measure student satisfaction of the course

(Eom et al., 2006)
Perceived Learning

- Introductory Course
- 4 years (2010-2014)
- n=683
- Anonymous pre- and post-course Likert-scale survey

- Students perceive they are learning during the semester
- Students perceive they are meeting the learning outcomes of the course

(Whitaker, 2017)
Perceived Learning

Student Learning Outcome #1: Knowledge

(Whitaker, 2017)
Perceived Learning

Student Learning Outcome #1: Knowledge

Before

After

p < 0.05

(Whitaker, 2017)
Student Learning Outcome #2: Comprehension

(Whitaker, 2017)
Perceived Learning

Student Learning Outcome #2: Comprehension

(Whitaker, 2017)
Perceived Learning

Student Learning Outcome #3: Application

(Whitaker, 2017)
Perceived Learning

Student Learning Outcome #3: Application

(Whitaker, 2017)
Problem

Students’ perception of meeting the SLO is subjective data and should be backed with objective data

Objective

To link questions on exams to a specific SLO and measure the success rates of answering the questions correct and relate to the students’ perceived learning
Experimental Design

4 exams given throughout the semester
- individual
- in-class
- closed book
- 50 minutes

Equal distribution of question types:
- multiple choice
- matching
- short answer
- “other”
  + long answer
  + math
  + graph interpretation
  + drawing
Experimental Design

Each question/answer was linked to an SLO:

**Student Learning Outcome #1**
Name, list, and define key terms and concepts currently used in the study of animal science. [KNOWLEDGE]

**Student Learning Outcome #2**
Locate, identify and describe the key terms/concepts and explain/discuss their significance in the animal sciences. [COMPREHENSION]

**Student Learning Outcome #3**
Demonstrate knowledge and comprehension by interpreting and solving problems and scenarios relative to the animal sciences. [APPLICATION]
Experimental Design

Introductory Animal Science Course
4 years (2010-2014)
n=683

Number of correct answers/question was determined

Grouped according to SLO

SLO “score” was compared to perceived student learning
Results

Rate of answering question types correct:

Multiple choice\textsuperscript{a} > matching\textsuperscript{b} = short answer\textsuperscript{b} > “other”\textsuperscript{c}

\textsuperscript{a,b,c}p < 0.05

No differences between:

\begin{align*}
P &> 0.10 \\
\text{number of questions/type question} & \\
\text{weight on type of question} & \\
\text{number of questions/linked SLO} & \\
\text{weight on type of question/linked SLO} &
\end{align*}
# Results: SLO #1 – Knowledge

<table>
<thead>
<tr>
<th>Student Learning Outcome</th>
<th>Mean Response (standard dev.)</th>
</tr>
</thead>
</table>
| #1. Name, list, and define key terms and concepts currently used in the study of animal science. [KNOWLEDGE] | Beginning of Semester: 3.40 (0.89)  
End of Semester: 8.00 (0.41)  
Scale: 1 = not at all, 10 = expert |

Class average (knowledge questions) and perceived student learning:  
\[ r = 0.93 \]
## Results: SLO #2 – Comprehension

<table>
<thead>
<tr>
<th>Student Learning Outcome</th>
<th>Mean Response (standard dev.)</th>
<th>Scale: 1 = not at all, 10 = expert</th>
</tr>
</thead>
</table>
| #2. Locate, identify and describe the key terms/concepts and explain/discuss their significance in the animal sciences. [COMPREHENSION] | Beginning of Semester: 3.20 (0.23)  
End of Semester: 7.94 (0.45) | |

Class average (comprehension questions) and perceived student learning:

\[ r = 0.89 \]
## Results: SLO #3 – Application

<table>
<thead>
<tr>
<th>Student Learning Outcome</th>
<th>Mean Response (standard dev.)</th>
<th>Scale: 1 = not at all, 10 = expert</th>
</tr>
</thead>
<tbody>
<tr>
<td>#3. Demonstrate knowledge and comprehension by interpreting and solving problems and scenarios relative to the animal sciences. [APPLICATION]</td>
<td>2.63 (0.48)</td>
<td>7.61 (0.48)</td>
</tr>
</tbody>
</table>

Class average (application questions) and perceived student learning:

\[ r = 0.88 \]
Conclusions

• Students’ perception that they are learning and are meeting the SLO of the course are justified based on average class performance on specific outcome artifacts

• Higher success rates equate to higher student perception of learning and tighter correlation coefficients

• Sample not an individual

• Students’ perception could be linked to course assessment artifacts other than exams (assignments and quizzes) to further validate student learning objectives are being met
Questions?