Student Learning Outcomes: Interpretations, Development, and Validity

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University of Minnesota
Overview

- Two separate research projects funded by the Undergraduate Research Opportunity Program (UROP) at the University of Minnesota
- Two separate lists of survey items
  - Student learning outcomes (SLOs)—institutionally defined
  - General development supporting SLOs
- Presenting the results of both qualitative studies today, along with common themes and recommendations
Measuring Students’ Learning

• Increased public and private demands for accountability to assess students’ learning and development in key areas
• Accountability and accreditation—primary drivers for assessment of student learning outcomes
• Students’ learning and development is no longer axiomatic
Factors Important to Employers

Employers are an important stakeholder too, as they desire undergraduates who possess skills in the following areas:

- Innovative
  - Essential to company success
- Critical thinking
  - Emphasis on five learning outcomes
- Large skill set
  - Greater responsibilities, larger set of skills
- Many Others
  - Global knowledge, community involvement, etc.
Measuring Learning Outcomes

• Colleges have traditionally measured students’ learning outcomes through student surveys
  – Less expensive than alternatives such as portfolios
  – Quick to administer and analyze
  – Often administered by external organizations (e.g., NSSE)
Self-Reported Surveys

• Yet, several challenges exist with students’ self-reports of their learning:
  – Subjective and encourage responses based on social desirability
  – Students interpret survey items differently
  – Survey items can be ambiguous, leading to different responses
  – Students’ self-reports have been deemed unreliable (Bowman, 2009; Porter, 2011)
Consequences

• Institutions that rely upon inaccurate self-reports may make policies/decisions incongruent with students’ experiences
• Universities report learning that may not exist
• Departmental growth may be minimal due to students’ unreliable or inconsistent responses
• “Prioritization” processes could lead to removal of degree programs
Research Questions

• How do college students interpret SERU survey items assessing their development of key learning outcomes?

• What evidence do college students provide to support their understanding of their development?
Validity

• Broad classes (and sub-classes) of validity
  – Content*
    • Domain of content (job performance, social studies))
  – Criterion*
    • Connected to outcome (graduation, academic achievement, rating scales used to indicate criterion)
    • Predictive
      – Differential
  – Construct
    • Trait or attribute (critical thinking ability, attitude)

(Pedhauzer & Schmelkin, 1991)
Validity

Additional validity types (NSSE’s Psychometric Portfolio)

• Response Process
  – Are items consistently interpreted and understood by respondents the way the researchers intended?
    • Cognitive interviews and focus groups

• Consequential
  – Are the survey results interpreted and used in ways that were intended

NSSE Source: http://nsse.iub.edu/html/validity.cfm
Validity is “an integrative and evaluative judgment of the degree of which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences and actions based on...modes of assessment” (Messick, 1989, p. 13)

The survey is neither valid nor invalid. The inferences made based on the survey are the focus of validity.
Validity Evidence

- Standards for Educational and Psychological Testing (1999):

“The process of validation involves accumulating evidence to provide a sounds scientific basis for the score interpretations. It is the interpretations of test scores required by proposed uses that are evaluated, not the test itself” (p. 9)
SERU Survey

- Student Experience in the Research University (SERU) survey
- Administered to all 28,000+ undergraduates at the University of MN
- Important source of data for assessment and accreditation
- Developed items related to student learning and development items in wildcard module
Please rate your proficiency in the following areas when you started at this institution and now:

1. Analytical and critical thinking skills
2. Ability to be clear and effective when writing
3. Ability to read and comprehend academic material
4. Understanding a specific field of study
5. Ability to understand international perspectives (economic, political, social, cultural)
SERU Items Measuring Development

Please rate your *ability* in the following areas when you started at this institution and now:

6. Ability to appreciate, tolerate, and understand racial and ethnical diversity
7. Ability to appreciate cultural and global diversity
SERU Items Measuring SLOs

To what extent do you feel that your experiences at this campus have contributed to your learning and development in the following areas?

1. Have mastered a body of knowledge and mode of inquiry
2. Can locate, define, and solve problems
3. Can communicate effectively
4. Can locate and critically evaluate information
5. Have acquired the skills for effective citizenship and lifelong learning
6. Understand the role of creativity, innovation, discovery, and expression across disciplines
7. Understand diverse philosophies and cultures within and across societies
Methods

• Two separate qualitative studies
  – Cognitive interviews asking students to interpret items related to their development in several areas
  – Interviews asking students to interpret seven student learning outcome items
Cognitive Interviewing

- Sample: third-year students who responded to the learning and development items
- Seven items placed into factor analysis—two items emerged
- Students recruited had factor scores +/- 1 SD from the mean
- Students recruited by emails from Alex
Cognitive Interviewing

- Given pool of possible interview candidates
  - Based off actual answers to SERU survey
- Emailed students about interview opportunity
  - Explained who I am
  - Incentive
- Met approximately 40 minutes
  - Open-ended, traditional cognitive interview
Cognitive Interviewing

• PART ONE (RQ1): Open-ended, non-leading probes
  – What are you thinking now?
  – What leads you to say that?
  – Could you say more?

• PART TWO (RQ2): More direct, yet non-leading probes
  – When you rated yourself good and then very good, what were you thinking?
  – How did that [experience] come about?
Interviewing for SLOs

- Sample: third-year students who responded to the student learning outcome items
- Seven items placed into factor analysis—two items emerged
- Students recruited had factor scores +/- 1 SD from the mean
- Students recruited by emails from Sarah
Research Question One

• How do college students interpret SERU survey items assessing their development of key learning outcomes?
Results: Cognitive Interviewing

- Understanding of academic and social development (item format: “When you started” vs. “Current ability”)
  - Experiences recalled to aid in mapping proficiencies
- Varying points in time (then vs. now) depending on student and item
  - Comparing high school (then) with college (now)
  - Comparing freshman year (then) with college (now)
- Interpreted Feedback from Others
  - Comparing outside rated performance (then) with college performance (now)
  - Comparing perceived ability (then) with perceived abilities (now)
Results: Cognitive Interviewing

- Tendency to avoid extremes
  - Modesty
  - Human nature
## Results: Cognitive Interviewing

Please rate your level of proficiency in the following areas when you started at this institution and now.

**Notice “excellent”**

<table>
<thead>
<tr>
<th>Analytical and critical thinking skills</th>
<th>When you started here</th>
<th>Current ability level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ability to be clear and effective when writing</td>
<td></td>
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<tr>
<td>Ability to read and comprehend academic material</td>
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<tr>
<td>Understanding of a specific field of study</td>
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<tr>
<td>Ability to understand international perspectives (economic, political, social, cultural)</td>
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</table>
Results: Cognitive Interviewing

• Making sense of items
  – Subjective terminology

• Complicated questions
  – “How can I answer this?”

• Loaded words
Results: Interviews

• Wide spectrum of responses along a theme

“Have mastered a body of knowledge and a mode of inquiry”

Mastering every single class  Liberal education, general education requirements  Being completely confident in a specific academic major
Results: Interviews

• Some consistency in broad ideas using different terminology—but often missing alternative ideas
  – “Being able to speak clearly to people
  – “I think it is like public speaking”
  – “To be able to talk to other students or people you’re working with…”
  – “Interact with another person and get your ideas across so you can tell each other about your results…”
Results: Interviews

• Long pauses and “I don’t knows”
  – “What does effective citizenship even mean?”
  – “Maybe I should actually take the time to read survey items!”

• Consistently referencing the same limited framework
  – Solve problems: “made me think of math and science”
  – Critically evaluate info: “makes me think of graphs or charts you see in math or science”
  – Lifelong learning: “developing critical thinking skills but not by taking another math class”
Research Question Two

• What evidence did college students provide to support their understanding of their development?
# Results: Interviews

<table>
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<th>SLO’s</th>
<th>1</th>
<th>2</th>
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<th>4</th>
<th>5</th>
<th>6</th>
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<td>6</td>
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<td></td>
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<td>2</td>
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</tr>
</tbody>
</table>

*University of Minnesota*
Results: Cognitive Interviewing

Pivotal experiences (life changing experiences that changed the way students thought)

- Out-of-class experiences
  - *From the U*
  - *Not from the U*

- Classroom-based experiences
  - *Academic development*
  - *Social development*

- Interactions with diverse others
  - *Social development*
Recommendations

- “As a result of your experiences at [University X]…”
- “When you started”…your first semester at this institution
- “Current ability”…as of this current semester
- Academic items and social items split into sections followed by open ended prompt
  - What experiences did you have at this institution that influenced your responses to these items
Recommendations

- Longevity – Survey fatigue is huge factor
- Explanations – Students want to expand
- Variety – Tendency to get bored
Recommendations

• In the case of SLOs, increase visibility across campus to enhance familiarity
• Consider offering these items on a separate survey so that students can focus on answering questions related to their learning/development
• Frame questions based on where students might have learned skills (e.g., from coursework, did you learn…)}
Recommendations

• Offer examples of items (e.g., understand the importance of research to advance society—describes “understand the role of discovery”)

• Offer several items to describe one idea (e.g., participate in electoral process, engage in community service to address “effective citizenship”)

• Pilot items and interview students about the items before administration
Thank you!

- Any questions?
References