Expanding the Use of an Existing Course/Program-level Critical Thinking Assessment to the Institutional Level

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First, a show of hands...

- How many of you are from:
  - Public Institution?
  - Private Institution?
  - 2-year College?
  - 4-year University?
About Sam Houston State University

- 4-year, public university approximately 1-hour north of Houston, TX.
- Student enrollment of approximately 20,000
- Classified as a “Doctoral University: Moderate Research Activity” by the Carnegie Classification of Institutions of Higher Education
Core Learning Objectives

According to the THECB, all public institutions should assess student attainment of six core learning objectives:

- Critical Thinking
- Communication
- Empirical and Quantitative Reasoning
- Teamwork
- Personal Responsibility
- Social Responsibility
THECB Definition of Critical Thinking

“creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information”
Critical Thinking Assessment at SHSU
Texas Assessment of Critical Thinking Skills (TACTS)

- Philosophy Program Critical Thinking Course

- Interdisciplinary collaboration
  - Philosopher & psychology doctoral student

- 2003 AACSB standards
  - Analytic thinking
  - Reflective thinking

- 2 Statisticians from Economics and International Business

- PHIL Adoption in response to SACS needs
Adoption & Retention Trade-offs

- All, except TACTS, require paying for tests

- Multiple Choice
  - Quick and cheap scoring
  - Limited training and ease of administration
  - Questions about data’s depth

- Written responses
  - Substantial investment required for scoring
    - Training scorers (inter-rater reliability)
    - Time to score
  - Greater data depth
Course-based Critical Thinking Assessment

- Philosophy adopted TACTS for assessing all Critical Thinking courses
- Holistic assessment of student improvement
- Added specific assessment of probabilities
- Added baseline for student improvement
- Expanding item analysis
- Investigating TACTS–CAT relationship
Partnership Between Philosophy and OAPA

- With the adoption of the new Core Objective of Critical Thinking, the Philosophy Programs existing assessment offered a natural opportunity.

- Wanted to continue the course-embedded assessment, but wanted to collect student ID’s along with student responses.
New Equipment

- OAPA purchased a new Scantron Reader Machine (EZData Reader) and appropriate Scantron reader software.

- OAPA also purchased Scantrons for use by the Philosophy Program when conducting the TACTS test.
New Procedures

- Philosophy faculty still administer the TACTS test; however, students are instructed to include their ID numbers in the appropriate location on the Scantron form.

- Completed tests are returned to OAPA for scoring and analysis.
Data Analysis

- OAPA provides the Philosophy Program with both raw data, as well as a completed report.

- Capturing student ID’s allows for OAPA to quickly identify those student who took both the pre- and post-test.

- Student pre- and post-test scores are analyzed using a dependent samples \( t \)-test.
For the 2015–2016 year, a total of 394 student provided their ID numbers and completed both the pre- and post-test.

On average, students scores increased approximately by 5 percentage points, (35.70% to 40.50%).

This difference was statistically significant $t(393) = -6.89, p < .001$; however, the effect size was small (Cohen's $d$ of 0.42).
How are these data being used?
By the Philosophy Program

- Compliance with SACS requirements
- Starting point for discussing objectives
- Quality Assurance/Quality Control across multiple sections/instructors while allowing broad academic freedom
Continuing Questions

- Parity between online and in-person sections?

- Moving toward item analysis
  - Focusing course-specific goals
  - Measuring specific outcomes
  - Feedback on individual strengths/weaknesses
Secondary Research Project

- Academic interest in metacognition and intellectual humility
  - Dunning–Kruger effect
  - Concerns about student motivation/engagement
  - Questions about the limits of rational argument

- 2 philosophers partner with OAPA
  - Measuring student performance vs. estimated performance
  - Fall 2016 data gathered
  - Expansion beyond PHIL 2303
TACTS data are only one piece of a much larger institutional puzzle.

TACTS test data will serve as an additional measure of critical thinking at SHSU. Other measures include:

- **The Critical Thinking Assessment (CAT) Test**
  - End-of-Experience, Direct Measure

- **The National Survey of Student Engagement (NSSE)**
  - Freshman/Senior, Indirect Measure
Core Curriculum Assessment Committee

- These data will join other core assessment data that are to be examined by the Core Curriculum Assessment Committee.

- Using all collected core assessment data, the Committee will work to highlight areas of strength, identify areas of weakness, and create strategies for improvement.
Secondary Data Analysis

- OAPA can also use the collected Student ID’s to gather additional demographic and student performance variables from the Institutional Research Office.
  - e.g., gender, ethnicity, major, GPA, SAT/ACT scores

- These variables can be used to conduct robust secondary data analysis.
  - Disaggregating student performance by demographic variables
  - Correlating Student Performance with additional performance metrics
By disaggregating student data, and better understanding its relationship with other metrics of student success, our institution will better understand who these students are, who are succeeding, and who need help.

This will allow us to better tailor curriculum improvements and student interventions.
SHSU is also using the Critical Thinking Assessment Test (CAT) to assess Critical Thinking at the Institutional Level.

In 2016, OAPA also administered the CAT within a Critical Thinking section that also took the TACTS.

Opens the door for a comparative analysis of student scores on both instruments.
Questions?

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