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CS97 Triangulation in Assessment of Student Learning Outcomes

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Abstract

Triangulation strategies involve utilizing at least three different assessment approaches to gathering data. It is commonplace in higher education for the limitations of assessment strategies to be highlighted. Triangulation acknowledges these limitations but presumes that when multiple perspectives point to the same conclusions, the odds are that the conclusions are valid. At Austin College we have used triangulation to examine relationships between national assessment data, internal assessment data, and institutional strategic planning to assess general education outcomes, including quantitative reasoning, oral communication, and critical thinking.

In reviewing ways to begin this presentation, I decided to steal words from Smith (2007) as if they were my own:

> Although I have been working in the area of evaluation and assessment for some time, I didn't come to it easily. Indeed, I think I can say I came to it with some resistance. Perhaps it was a reaction to so much of the early work that seemed to privilege tests. Perhaps it was the evidence of the limitations of standardized testing, especially high stakes testing, for the assessment of learning or anything. Perhaps it was my sense that talking about assessment and evaluation to groups of academics and academic administrators was a little like talking about a root canal. (p. 7)

I am in my fourth year as Associate Vice President for Institutional Effectiveness at Austin College; however, I am first and foremost a professor of psychology, specializing in developmental psychology. As a result, I have spent far more time looking at the development of individuals during the transition to adulthood than I have looking at institutional challenges in assessment and evaluation. Here, I hope to explain how we have tackled assessment during the year in which we have also been preparing for our reaffirmation of accreditation.

Several sources have been helpful in setting the stage for the "triangulation" I want to describe. For example, after the previous 'root canal' comments, Smith then asks how we determine whether we are really achieving student learning

and student success and how we ensure that our institutional practices are aligned both with assessment efforts and using results of those efforts. He then says that the answers to such questions:

> can and will emerge if we frame assessment not as a reductionistic effort or one that simply focuses on those things that are easily measured or as something that requires compliance. (p.8)

Smith argues for an organizational approach to measurement.

Although looking at assessment in the context of the college or university as an organization is helpful, Wright (2007) also reminds us that assessment is not simply about institutional systems:

> Assessment is not measurement. Assessment is a process, a very human and humanistic process, that includes looking at our students' learning, determining what strengths and weaknesses are present in the performances relative to what we had hoped to see and then deciding what to do about improving their learning, if that seems necessary. (p. 45)

We are faced then with two challenges. We are supposed to do assessment despite the fact that "there is no modal student in American higher education" (Katz, 2008). We are also supposed to "seek more adequate means of both culminating and longitudinal assessment of undergraduate learning" (Katz, 2008). Perhaps it is because the idea of narrative is very prominent in developmental psychology, I like the way in which Sotherland, Dueweke, Cunningham, and Grossman (2007) characterize the process we face:

> Writing a story about how well a college helps its students become better educated is an endless helix of "counting and recounting" (Shulman, 2007), yielding a series of narratives that track a college's educational trajectory. When discussed openly, both within and among institutions, these iterative accounts gleaned from measures of student learning can improve undergraduate education by making it more transparent (Bok 2006). (p.20)

The idea of triangulation has been in the assessment literature for at least two decades. There are two different ways of thinking about it that have informed this project. First, Thomas, Lightcap and Rosencranz (2005) address its value in assessing general education:

> Triangulating methods of analysis is commonly recommended to overcome validity problems. . . . The idea is a simple one; when multiple threats to validity of measures emerge, use multiple sources of data generated by multiple methods of analysis to meet them. If the different methods seem to lead to similar conclusions, then the level of uncertainty is reduced. (Thomas, et al., 2005, np).

From this perspective, then, triangulation helps with the formal requirements for good assessment and evaluation. By using multiple methods, we reduce reliance on any single measure that may be, and usually is, inherently flawed. Examples of such methods include:

1. Such national assessments as the NSSE, the CLA, etc.
2. Such locally developed rubrics, portfolios, pre-post tests, etc.
3. Such disciplinary measures as content exams, but also those that focus on particular skills – writing, speaking, research skills, etc.

However, these methods must be selected and implemented in relation to the institutional mission, strategic plan and program assessment. This also supports Sotherland et al.'s focus on the retelling of one's institutional story about one's mission.

We began our work on triangulation with our mission. You can see (p.4) both our mission and the themes we inferred from it and see as central to the "story" of Austin College:

- critical inquiry skills,
- oral communication skills,
- written communication skills,
- information literacy skills,
- quantitative reasoning skills,
- openness to diversity, and
- citizenship/civic engagement

We also wanted to be faithful to the idea of not using assessment in a reductionistic effort to simply check off boxes for either institutional assessment or student learning. If assessment is going to be iterative, creating the helix to which Shulman alludes, it has to take on the "human and humanistic" qualities Wright recommends. Thus while the first approach to triangulation tells us to use multiple methods and seek the common inferences to which they point, the second approach comes from the work of Coats and Stevenson (2006) who describe their Learning Outcomes and Their Assessment (LOTA) project. They note that they:

> . . . decided not to follow a competency route where designated learning outcomes were recorded as 'achieved' or 'not achieved' by each individual student. . . . Our main reservations about a competence approach is that complex learning in an HE [Higher Education] environment cannot be reduced to a limited number of outcomes that can then be recorded as 'achieved' or not by every student without reducing the complexity of learning to a number of behavioural statements.

Similarly, our seven competencies are derived from our mission but not limited to simple behaviors.

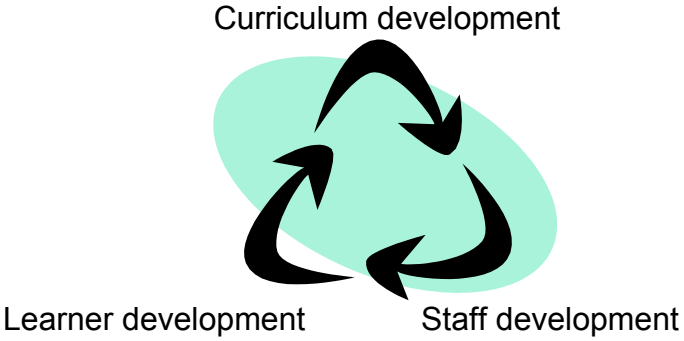
The Austin College Mission
And
College Competencies

An Austin College education transforms the intellectual lives of students as it *challenges them* to deepen their understanding of **social, ethical, and global** issues as well as their own place in a rich **complex of evolving cultural traditions**. *Sustained critical inquiry* lies at the heart of an Austin College education, ***enhanced by breadth of experience and focused through in-depth study***. The goal is to enable students to develop themselves as productive members of society who can *think clearly and critically*, **understand and respect difference**, and ***express themselves persuasively.***

Consistent with the goals of a liberal arts education, Austin College encourages its students to *inquire freely, to cross traditional boundaries,* and to challenge conventional wisdom while respecting the rights of others. The college seeks to provide an academically challenging and lively community of students and teachers who are committed to intellectual growth through ***individual and collaborative endeavors***. Austin College graduates are prepared for lives of responsible leadership, enhanced by continued learning, and enriched by lasting values.

Critical inquiry skills = italics and underline
Openness to diversity = bold
Citizenship and civic engagement = underline
Communication/literacy skills = Bold, italics and underline
Oral communication skills
Written Communication skills
Information literacy skills
Quantitative reasoning skills

For Coats and Stevenson, "*Triangulation* refers to the relationship between curriculum development, staff (or professional) development and development of the learner."



A 2nd way to look at triangulation is, therefore, placing curriculum development, staff development, and learner development at the corners of the triangle. This approach moves the conversation to improvement of what we do through on-going assessment linked directly to how faculty think about assessment and its relationship to their curricula. This approach is not new. Coats and Stevenson cite Gipps (1994) saying:

> Assessment is undergoing a paradigm shift from psychometrics to a broader model of educational assessment, from a testing and examination culture to an assessment culture.

They also quote Boud (1995):

> Good assessment now is that which most closely reflects desired learning outcomes and in which the process of assessment has a directly beneficial influence on the learning culture.

Finally, also from the 1990s, Willis (1993, cited by Coats & Stevenson, 2006) says:

> Rather than assessment being something you do to people, it is an interactive activity between students and teacher that can play an important role in providing feedback, the aim of which is to improve the quality of future learning.

Coats and Stevenson's work appeals to me because they conclude by talking about things that they see as positive in their work, including making their "colleagues focus on teaching and learning and, above all, on assessment rather than the content of their courses," raising "awareness about the 'staff development' inherent in curricular change," and constantly being "aware of the enhancement of the learning experience" in their students.

Both approaches to triangulation are attractive to faculty colleagues. The first approach acknowledges the flaws inherent in any single assessment method. The second attempts to persuade colleagues that assessment is not about 'content' as much as it is about how a program can ensure that its curriculum is achieving the student learning outcomes valued by the program and the institution.

Although we have examined all seven of the learning outcomes we derived from our mission, I want to address how three of them have been helpful to Austin College. I am using the examples to illustrate different methods triangulation.

Oral communication skills

One of the advantages of the National Survey of Student Engagement (NSSE) is that it enables us to compare ourselves to several groups – a selected group of peer institutions, those institutions in our Carnegie classification who participated in the NSSE in a particular year, and the sample of all NSSE participating schools. We administered the NSSE to both first year and senior year students

in 2003 and 2006; we will administer it again in spring 2009. This schedule allows us to look at differences between first year and senior students on campus in a particular year, cohort differences between first year and seniors' differences at different assessment years, and the longitudinal data from the first years in 2003 who largely make up our seniors in 2006. Although the NSSE asks students for a self-assessment of their "speaking skills," we selected a total of twelve items from the NSSE that, to us, imply oral communication.

Section 1 on Academic and Intellectual Experiences asks: In your experiences at your institution during the current school year, about how often have you done the following? Responses can be: 1 = never, 2 = sometimes, 3 = often, 4 = very often.
1b. Made a class presentation
1n. Discussed grades or assignments with an instructor
1o. Talked about career plans with a faculty member or academic advisor
1p. Discussed ideas from your readings or classes with faculty members outside of class
1t. Discussed ideas from your readings or classes with others outside of class (students, family members, co-workers, etc.)
1u. Had serious conversations with students of a different race than your own
1v. Had serious conversations with students who are very different from you in their religious beliefs, political opinions, or personal values.

Section 8 is labeled Quality of Relationships. The instruction is: Mark one box that best represents the quality of your relationships with people at your institution. Responses are 1 = unfriendly, unsupportive, sense of alienation and 7 = friendly, supportive, sense of belonging.
8a. Relationships with other students
8b. Relationships with faculty members
8c. Relationships with administrative personnel and offices

Section 11 asks about Educational and Personal Growth: To what extent has your experience at this institution contributed to your, knowledge, skills, and personal development in the following areas? Responses can be: 1 = very little, 2 = some, 3 = quite a bit, 4 = very much.
11d Speaking clearly and effectively
11h Working effectively with others

Note that we retained the self-assessment regarding speaking clearly and effectively. The others, in our view, entail, among other things, oral communication skills. In the first set of questions, students are reporting speaking behaviors. We also believe that the relationship questions will only be answered in the direction of 7 rather than 1 if oral communication is taking place. When students credit the institution with having increased their ability to work effectively with others, we believe they must have been talking with them.

While the NSSE is often criticized as "merely" self-report, if we want to look at student behaviors, why not let students be one of our sources of information? I should also add that, the first time I went through a report of NSSE data, I was bleary-eyed by page 5. Part of the motivation to ask focused questions came from a desire to figure out how we could use the NSSE data in a meaningful way. Once I undertook the task of seeking items that might speak to oral communication or civic engagement or critical inquiry skills, I could integrate the data from different cohorts and look at value added at Austin College relative to our peer groups.

Our first perspective on oral communication was our mission, which in our view dictates that we enhance students' skills if they are to "express themselves persuasively" but also "understand and respect difference," are committed to "collaborative endeavors" and have "lives of responsible leadership." There is clearly overlap between and among the seven competencies, but that complexity sits well with us.

The second perspective was the NSSE data which, in our case, are very positive, suggesting value added longitudinally between first and senior years, between first years and seniors in any given year, and between Austin College students and those who completed the NSSE at peer institutions.

The third perspective is locally developed assessments. Several of these reflect the approach to triangulation taken by Coats and Stevenson. We do not require a course that meets an "oral competency" requirement. One of the advantages of not doing so has been that as departments have undertaken assessment planning, many articulate oral communication goals as central to progress in their discipline. Although many programs have done so, I want to use physics and modern languages as example. Faculty in physics first agreed on a presentation evaluation rubric that they use to assess student formal presentations at the end of the course. Extensive discussion of the rubric is in the syllabus for the Research in Physics course and reinforced as the semester progresses. Similarly, colleagues in French and German have decided to create pre- and post-study abroad videotapes of conversation so that they, too, can better articulate to students who have not had immersion experiences what they fail to do when they speak and also demonstrate the gains from study abroad.

Quantitative reasoning

The oral communication example is a nice one in that, at least from what I have told you, it makes us look good. In the case of quantitative reasoning I want to talk about assessment that helps us target needs for further assessment, program development and evaluation of institutional policy.

Between 2003 and 2007, Austin College collected data from both faculty and students from six national assessment instruments:

1. National Survey of Student Engagement (NSSE) administered to first year and senior students in 2003 and 2006
2. Your First College Year (YFCY) and
3. Cooperative Institutional Research Project (CIRP) administered to first year students 2006-2007
4. College Senior Survey (CSS) administered to seniors Fall 2007 (the CIRP, YFCY and CSS are all HERI instruments with many similar items)
5. Collegiate Learning Assessment (CLA) administered to first year and senior year students in 2006-2007
6. Faculty Survey of Student Engagement (FSSE) 2003

In each case, fairly large and representative samples of Austin College students and faculty can be compared with large national samples.

We found a number of interesting patterns in these data:

1st, when asked about growth in their quantitative skills, our First Year (FY) and Senior Year (SY) students in 2006 are not statistically different from peers. In 2003 the FY AC students report significantly more growth than peers but SY is not significantly different and the SY-FY difference is negligible. The longitudinal data (2003 FY and 2006 SY) reveal a lower gain (or value added) at AC than at peer institutions. This is atypical in that in most areas, our students report greater gains rather than smaller ones.

2nd, First Year students in 2006 completed the CIRP in early fall and the YFCY in the spring. When asked if they saw themselves as above average or in the highest 10% of skills in “mathematical ability”, the 142 AC students’ self-assessment declined by -12.9 points (students at peer institutions declined far less). Although between fall and spring AC students seem to become more self-critical in general, this is the area of greatest self-rated decline. When seniors completed the College Senior Survey (like the CIRP and the YFCY a HERI measure) in Fall 2007 their self-assessment was 31.6% who saw themselves as above average or in the highest 10% of skills in “mathematical ability.” These are different students but, again, the trend is atypical – in most areas our students rebound from the YFCY levels. Here our students continue a freefall.

3rd, on the CLA in 2006-2007 our SY students had a mean score on the Performance Task (a 90-minute task requiring, in part, the use of statistical and numerical information) .5 standard deviation below the national mean. On closer analysis, many of the low scoring seniors had very high GPAs and some were majors or minors in the social or natural sciences. Although there were other problems with the size and representativeness of the two samples, as well as potentially with the instrument itself, it was not easy to explain how our seniors

could fall below the national mean. Overall, we were "at expected" in 2006-2007 and "above expected" in 2007-2008. A cursory glance at the report from CLA might have led us to feel we were doing okay. Only through the finer analysis of tasks examining SATs and, in the case of seniors, GPAs, majors and minors did our concern focus on quantitative reasoning skills instead of critical inquiry or writing skills. Although I won't have time to speak to it here, we used additional triangulation methods to examine critical inquiry and analytical writing (the terms used by the Council for Aid to Education when it reports CLA data).

4th, on the HERI Faculty Survey, faculty members are asked to focus on a single course. Faculty are asked to focus on a single course. Nevertheless, 56% of the responding faculty reported very little effort to enhance student ability to analyze quantitative problems. Although 45% of the respondents were in arts or humanities where quantitative problems are uncommon, there was some concern that too many faculty were assuming that growth in quantitative reasoning was taking place in someone else's course.

5th, in October 2006, our VPAA, Mike Imhoff sent a memorandum to the Curriculum Committee detailing his assessment of the quantitative competency requirement at Austin College. The requirement had been approved in 1995. He had reviewed recent statements about quantitative literacy, reasoning and competency from peer institutions and conducted a transcript analysis of fifty randomly selected students from the May 2006 graduating class. He recommended that the Curriculum Committee create a set of guidelines for courses fulfilling the quantitative competency requirement.

These data, when combined with comments by faculty across the campus led to further discussion of the college's quantitative reasoning policy. Although the college had had in place a quantitative competency requirement, quantitative competency was defined very broadly.

In February 2008, the VPAA brought from the Curriculum Committee to the faculty a motion that:

1. Better defines quantitative reasoning
2. Enables students to take two ½ Q courses instead of a single Q course (thereby encouraging students to take courses in which quantitative reasoning plays a substantive but not major role)
3. Encourages departments to submit courses that will fulfill the requirement

We will be using program assessment and a new triangulation to see whether these refinements pay off.

Quantitative reasoning skills illustrate a very different benefit of triangulation. Like many institutions, we shifted from a formal reasoning requirement to a quantitative competency requirement over a decade ago. We had not, however,

fully assessed the new requirement except to ensure that students were fulfilling it as a graduation requirement. In this case, we had data from several national assessment instruments as well as internal conversations and analyses. For me, this is a nice affirmation of both kinds of triangulation – Thomas et al.'s idea of using multiple assessment strategies as perspectives on quantitative reasoning in our students and Coats and Stevenson's notion of a staff development-curriculum development-learner development triangle.

Written communication skills

While the quantitative reasoning assessment data led us to change institutional policy, our last case illustrates the need to not overreact to what appear to be negative data in national assessments. Written communication skills at Austin College are ensured, in part, by a "W" Writing Competency requirement. Students must complete one "W" or two "half-W" courses in order to graduate. Our triangulation here includes the mission, institutional policy and NSSE data. As we did with oral communication skills, we looked broadly at the questions on the NSSE, assuming for example that reading more pays off in writing better. While our students' self-assessments of the improvement in their writing skills and the amount of reading they do for coursework and personal pleasure are quite positive, there are three specific questions that ask about "Number of written papers or reports" – 20 pages or more, 5-19 pages long, and fewer than 5 pages. On intermediate and long papers, our students report significantly fewer papers than do students at peer institutions. On short papers, our students report non-significantly more in the first year and non-significantly fewer in the senior year. We also noted that these three questions are among the items that are used to define the NSSE benchmark labeled "Level of Academic Challenge." Although our senior means are higher than our freshman means and significantly higher than national means, they were not significantly higher than those of our peers.

These data were baffling because they were inconsistent with data from the HERI instruments, where unlike quantitative reasoning, writing ability is assessed as higher on the YFCY than the CIRP and, among our seniors, 76.4% see their skills as above average or in the top 10%. Our most recent CLA scores exceed those from 71% of the liberal arts institutions completing it. On the HERI Faculty Survey 93.8% of our faculty see it as "very important" or "essential" that we set promoting student writing as a goal. It also seemed to us that our students write a great deal. In fact, we have been collecting data on course-related activities that support peer learning and collaborative research and had substantial anecdotal evidence that our colleagues offer a wide range of experiences intended to enhance writing skills. We then reviewed our "W" course guidelines. They specify that writing must be submitted "in multiple versions" and that types of writing may include "abstracts, analyses, book reviews, briefs, case studies, comparisons, critiques, essays, field/lab reports, field/laboratory notes, film or

other art reviews, term papers, translations – as long as this first condition for practice and/or revision is met. Examinations may count as part of the required written work only if they are done outside of class and are given comparable commentary and evaluation." It was only in rereading our own Writing Competency requirement and reviewing colleagues' anecdotes that we identified the many kinds of writing –blogs, group work on translation of texts, brief writing exercises, etc. – which would not likely come to mind when a student is asked a question about numbers of papers of a particular length. Furthermore, when multiple drafts are submitted, for the average student, that is one paper.

In this instance, we have so far decided that the problem lies in the NSSE and not in our students. As noted above, a cursory glance at the NSSE benchmark "Level of Academic Challenge" might have led us to infer that we had a problem.

Conclusions

My purpose here has been to illustrate the benefits of two different approaches to triangulation, Thomas et al. (2005) who argue that multiple perspectives enhance the validity of our inferences about assessment and Coats and Stevenson (2006) who propose a staff development-curriculum development-student development triangle as a means of creating an assessment climate. The triangulation approaches we have used have had the following strengths:

1. Assessment is not seen as reductionistic (Smith, 2007) since institutional mission, strategic planning and our policies are always used as part of the triangle.
2. Utilization of national assessment instruments capitalizes on their strengths in providing valuable comparative data while not ignoring their limitations.
3. Assessment becomes a human and humanistic process (Wright, 2007) rather than a process of jumping through hoops or submitting forms.
4. Assessment produces multiple narratives – what Sotherland et al. (2007) call the 'endless helix' – whereby we track our trajectory.

The final point that I would like to make is that this process – of taking a focused question, examining available data and then presenting the question and the data to faculty, administration, and our Board of Trustees – has increased very significantly the engagement of our colleagues in assessment at Austin College. They ask better questions, seek better strategies in their own planning and evaluation processes and bring new energy to our efforts.

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