Evaluating Faculty Perceptions of Student Learning Outcomes: A Rasch Measurement Analysis

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Background: The importance of assessing student learning outcomes has demanded attention from most everyone involved in the higher education enterprise, as accreditation and funding implications are often linked to the results. Faculty, however, are often critical of the assessment process because outcomes assessment is costly with regard to time, energy and other resources, and evidence of its effectiveness is not always noticeable.

Purpose: The purpose of this article is to evaluate faculty perceptions of various student learning outcomes in order to determine which types outcomes are most valued by faculty.

Setting: United States.

Intervention: Not applicable.

Research Design: The HERI Faculty Survey was utilized to capture a nationally representative snapshot of faculty perceptions of student learning outcomes.

Data Collection and Analysis: The Rating Scale Model, a Rasch measurement model, was used to analyze survey data of 7,356 respondents.

Findings: Faculty from virtually all disciplines are primarily concerned with the intellectual growth of students. All other types of student learning outcomes (i.e., social, emotional, cultural growth) are of lesser concern. These findings suggest higher education institutions seeking "faculty buy-in" may want to consider focusing more on intellectual types of outcomes as these outcomes appear to best resonate with faculty, and in turn may result in less faculty resistance.

Keywords: *outcomes evaluation, Rasch Measurement, Rating Scale Model, item response theory, faculty, student learning outcomes, higher education assessment*

The topic of student learning outcomes essentially has become synonymous with "assessment" in higher education. The importance of assessing student learning outcomes has demanded attention from most everyone involved in the higher education enterprise. Virtually every unit on a college or university campus is expected to assess student learning objectives, both for accreditation purposes and for the continuous improvement of educational quality.

However, faculty often are especially critical of the assessment process, as outcomes assessment is costly with regard to time, energy, and other resources. Despite the occasional lack of support for outcomes assessment, faculty remain the front line of student contact and instruction. Given the vital role of faculty in assessing the student learning outcomes process, it is critical that researchers and assessment practitioners understand how faculty perceive various student learning outcomes.

Although it is true that the responsibility of teaching lies in the hands of faculty, it also is true that faculty have their own values and interests which may have significant implications on effective teaching. The seminal work on faculty teaching objectives was published in 1993 by Angelo and Cross. The authors concluded, "what you teach has a good deal to do with how you teach—or at least what your teaching priorities are and how you perceive your primary role as a teacher" (p. 369). The authors identified academic discipline as the main factor in explaining differences among college faculty, stating:

> Faculty teaching priorities are related more to academic discipline than to any other factor. Teachers of a given discipline—whether male or female, full-time or part-time, experienced or inexperienced, teaching in a public community college or a private four-year college—share a value system with respect to teaching goals that is distinctly discipline-related and significantly different from that of colleagues in different disciplines (366).

Numerous studies have corroborated the significant influence of academic disciplines when understanding faculty attitudes and behaviors (Alpert, 1985; Becher, 1987; Clark, 1980; Ladd and Lipsett, 1975; Lee, 2004; Smart, Feldman & Ethington, 2000). Other researchers have found faculty to have different instructional goals depending on their disciplinary affiliation (Donald, 1990; Fox, 1997; Franklin & Theall, 1992; Neumann, Parry, & Becher. 2002; and Swenson, 1997). The one exception to this general trend is that regardless of disciplinary affiliation, most research has suggested faculty are primarily concerned with the intellectual growth of students (Jervis and Congdon, 1958; Lawrence, Hart, Mackie, Muniz, & Dickmann, 1990; Liebert & Bayer, 1975; Platt, Parsons, & Kirshstein, 1976; Royal, Eli, & Bradley, 2010; and Wilson, Gaff, Dienst, Wood, & Bavry, 1975). Lawrence et al. found this primary focus on intellectual growth is consistent across all college types (i.e., community colleges, four-year colleges, universities, etc.).

Liebert and Bayer (1975) found goals pertaining to students' moral and personal development were generally considered less important when compared with the intellectual growth of students by faculty at four-year colleges and universities. Jervis and Congdon (1958) asked faculty to rank four major outcomes in order of importance and found faculty ranked "intellectual growth" first, "self-fulfillment" second, "self-understanding" third, and "social growth" forth. Royal, Eli, and Bradley (2010) found community college faculty as a whole are overwhelmingly concerned with the intellectual growth of students, followed moderately by emotional, social, and cultural growth outcomes.

Stark and Morstain (1978) found faculty from the natural science and professional fields are more concerned with "preparation for life and work" than faculty from the social science and humanities fields. Conversely, social

science and humanities faculty tend to be more concerned with the "pursuit of ideas" than faculty from the natural science and professional fields. In extant research, Braxton and Nordvall (1985), Gaff and Wilson (1971), Lattuca and Stark (1994), and Smart and Ethington (1995) found faculty in natural and physical sciences are more likely to require memorization and application, whereas faculty in social and behavioral sciences and humanities are more likely to address critical thinking. Also taking disciplines into account, Royal et al. (2010) found community college faculty who consider themselves "strong/moderate 'hard' scientists" are concerned with non-cognitive outcomes (social, emotional, and cultural growth) at a significantly lower degree than faculty who align themselves more with the social and behavioral sciences and humanities fields.

Additionally, Leverenz and Lewis (1981) found faculty often have different instructional goals depending on whether their educational background is consistent with their current teaching appointment. The researchers found faculty with an educational background consistent with their current teaching appointment are concerned primarily with "discipline-oriented goals." Faculty whose background is inconsistent with their current teaching appointment are largely concerned with teaching students life skills.

Findings Based on Relevant Models

A number of scholars have attempted to use various classification systems and/or models to serve as a framework for understanding the similarities and differences. Some of the more popular classification systems/models include Biglan and Kolb's models and Holland's theory. Anthony Biglan's model classifies disciplines according to "hardness" (soft versus hard sciences), whether the field is pure versus applied in nature, and whether it pertains to life versus nonlife subjects (Biglan, 1973a, 1973b). David Kolb's research on learning styles and experiential learning (1980) added to Biglan's model by including two additional dimensions: active versus reflective, and abstract versus concrete.

Another classification system is Holland's theory of person and environment fit (Holland, 1966; Smart, Feldman, & Ethington, 2000). This theory was borrowed from the psychology literature and essentially classifies persons and academic disciplines according to six measures, the RIASEC classification system, otherwise known as "Holland types." The types include: realistic, artistic, investigative, social, enterprising, and conventional. Holland's theory suggests if an individual and environment share the same RAISEC code, the individual likely will persist and find satisfaction within that environment. The converse is expected when a lack of congruence exists between the person and the environment.

Research on faculty instructional goals based on previously established higher education classification systems has found a number of interesting results. Smart (1982) used Holland's theory as a classification system and found faculty from realistic, conventional, and enterprising disciplines are more concerned with vocational development than faculty from artistic, social, and investigative disciplines. Smart also found faculty from social and artistic disciplines are more likely to be concerned with issues of personal development and

character-building than faculty from other Holland environments.

Research using Biglan's model also has found interesting results. Biglan's (1973b) study found that faculty from the "hard" sciences are more concerned with research and less concerned with teaching than faculty from the "soft" sciences. Additionally, applied disciplines appear to be more service-oriented than pure disciplines, and nonlife-systems faculty appear to possess a greater sense of commitment to teaching than faculty from life-systems disciplines. Smart and Elton's (1975) researched echoes much of Biglan's as they found (using the Biglan model) faculty from the "hard" disciplines are more concerned with research and student development than faculty from "soft" disciplines. Smart and Elton also found that faculty from applied disciplines share a greater sense of commitment to service and are more concerned with student development than faculty in the pure disciplines. Further, Smart and Elton found faculty from the life-systems disciplines are more concerned with service than faculty from nonlife-system disciplines.

Purpose

A great deal of research has been conducted to improve assessment and learning processes; however, little modern research has investigated the perspectives of faculty as it relates to perceptions of student learning outcomes. Although a rich literature exists, it is for the most part at least a decade old. This study intends to revisit this important literature by providing a more modern perspective of faculty perceptions of student learning outcomes. Additionally, most previous research has been limited by insufficient data to effectively measure faculty perspectives from virtually all the academic disciplines present on a typical university campus. Small sample sizes have forced most researchers to focus on only a select number of disciplines, or to apply theoretical models to the confines of the data with which they have available. While it would be foolish to ignore the influence of academic disciplines upon faculty perceptions, it is possible to generate some valid and reliable findings regarding the holistic faculty perspective. This can be done by conducting an evaluation that uses a large national dataset with adequate representativeness from the full spectrum of academic disciplines. Further, using a powerful measurement technique for data analysis such as the Rasch measurement model (Rasch, 1960), a technique that is largely nonexistent in the higher education research literature (Royal and Bradley, 2008), can provide a fresh perspective to evaluation methods and perhaps generate more meaningful findings. Specifically, the Rasch Rating Scale Model (Andrich, 1978) not only corrects many of the erroneous assumptions typically made in traditional survey research (e.g., treating ordinal data as interval, treating raw scores as measures, treating each item as equally important, etc.), but provides illustrations and methods of presenting results that are currently unavailable with traditional quantitative analyses.

Methods

Instrumentation

This study uses the UCLA Higher Education Research Institute (HERI) 2001 Faculty Survey. The HERI Faculty Survey is administered triennially, with

the most recent survey administered in the 2007–2008 academic year. Since its inception in 1989, more than 300,000 faculty at more than 1,100 higher education institutions have participated in the survey (HERI Faculty Survey, 2006).

Response Frame

The complete HERI Faculty Survey dataset contains more than 20,000 records of faculty from all institutional types. This study investigates only regular series, tenure-track faculty at both public and private research universities, resulting in a reduced dataset. The rationale for this exclusion includes issues of direct relevance and simplicity in reporting. The final data set for this study contains 7,356 responses.

Variables

Researchers may request any number of variables from the HERI database. For purposes of anonymity, the HERI masks data so individual persons and institutions cannot be identified. Requested data are distributed in aggregate form. In this study, data are requested for relevant demographic items and item #19 of the faculty survey, which asks faculty to "indicate the importance to you of each of the following education goals for undergraduate students:" using a 4-point scale with response options: 4 = essential; 3 = very important; 2 = somewhat important; and 1 = not important (see Table 1).

Table 1
Item 19 of the HERI Faculty Survey
Faculty Education Goals for
Undergraduate Students

Item
Q1 Develop ability to think critically
Q2 Prepare students for employment after college
Q3 Prepare students for graduate or advanced education
Q4 Develop moral character
Q5 Provide for students' emotional development
Q6 Prepare students for family living
Q7 Teach students the classics of Western civilization
Q8 Help students develop personal values
Q9 Enhance the out-of-class experience of students
Q10 Enhance students' self-understanding
Q11 Instill in students a commitment to community service
Q12 Prepare students for responsible citizenship
Q13 Enhance students' knowledge of and appreciation for other racial/ethnic groups
Q14 Study a foreign language

Characteristics of Respondents

The sample for this study consists of 7,356 regular series, tenure-track faculty from both public and private research universities throughout the United States. The term "research university" refers to institutions that award doctoral level degrees in at least five different disciplines. The sample consists of more male (66%) than female (34%) respondents. With regard to age, the sample is normally distributed with most respondents (approximately 85%) reporting between the ages of 35–64 years. Few faculty (about 15%) report

being younger than 34 or older than 65 years of age. The sample consists of 89.5% White/Caucasian, 4.2% Asian American/Asian, and 2.1% black/African American respondents. American Indian, Mexican American/Chicano, Puerto Rican American, and other Latinos comprise the remaining 4.2% of the sample.

Demographic characteristics for the sample include the variables: employment status, principle activity, academic rank, tenure status, primary interest, type of degree earned, and political views. Ninety-five percent of the respondents in the sample are employed full time, with 85% of the sample reporting teaching as their principle activity and only 11.3% reporting research. With regard to academic rank, 34.7% report holding full professor status, 27.8% associate professor status, and 24.2% assistant professor status. Faculty reporting the rank of instructor, lecturer, and "other" account for the remaining 13.5%. When asked about tenure status, 58.5% of the sample report holding tenure, while 41.5% do not. It should be noted that approximately 6% (n = 438) of the sample did not answer the question about tenure status, which explains the discrepancy in percentage based on those reporting at least associate professor rank. Over half of the respondents (56.8%) indicate a primary interest in teaching, as opposed to 43.2% who indicate a primary interest in research. Approximately 80% of the sample report holding a doctorate degree and 14.8% report holding a master's degree as the highest degree earned. Finally, with regard to political views, 17.7% selected conservative, 32.8% selected middle of the road, and 49.5% chose liberal. Faculty from 59 academic disciplines are included in the present study.

Rasch Measurement

Rasch measurement, a form of item response theory, was used as the primary method of data analysis because the technique provides a number of advantages over traditional statistical approaches. Rasch models are logistic, latent trait models of probability for monotonically increasing functions. Unlike statistical models that are developed based on data, Rasch measurement models are static models that are imposed upon data. Rasch models assume the probability of a respondent agreeing with a particular item is a logistic function of the relative distance between the person and item location on a linear continuum. Although dichotomous and polytomous versions of Rasch models are available, the Rating Scale Model (Andrich, 1978) is appropriate for the analysis of survey data. Its formula is:

$$\ln\left(\frac{P_{nij}}{P_{ni(j-1)}}\right) = B_n - D_i - F_j$$

where, P_{nij} = the probability that person n encountering item i is observed in category j, B_n = the "ability" measure of person n, D_i = the "difficulty" measure of item i, (the point where the highest and lowest categories of the item are equally probable), F_j = the "calibration" measure of category j relative to category j-1 (the point where categories j-1 and j are equally probable relative to the measure of the item); and no constraints are placed on the possible values of F_j. Winsteps measurement software was used to perform the Rasch analysis (Linacre, 2010).

Survey Validation

Rasch analyses of survey data require a number of quality control checks to ensure the data adequately fit the model and that the rating scale is functioning properly (Bond & Fox, 2001; Royal, 2010).

This includes an investigation of summary and model fit statistics, and various procedures that investigate rating scale quality. Here, each of these processes will be evaluated to ensure quality measurement is taking place. Once sufficient evidence is provided, results will be presented, followed by an interpretation and discussion of results.

An investigation of infit and outfit mean square statistics indicates the data sufficiently fit the Rating Scale Model (see Table 2). These indicators provide evidence of unidimensionality in the data (a requirement for Rasch models) and present evidence of strong content validity. Winsteps measurement software produces reliability estimates for both persons and items. Person (faculty) reliability was .86 and item reliability was 1.0. These estimates indicate high reliability measures for both persons and items. It should be noted the perfect reliability of 1.0 for items is likely due to more than 7,500 responses to just 14 items.

Table 2
Model Fit Statistics

	Measure	Model Error	Infit Mean Square	Outfit Mean Square
Faculty				
M	.19	.40	1.01	1.03
SD	1.07	.05	.55	.66
Item				
M	.00	.02	1.01	1.03
SD	1.26	.00	.28	.31

An evaluation of rating scale functioning was performed via a rating scale diagnostic analysis and a probability curve analysis. Response options for the particular survey item are as follows: 4 = essential; 3 = very important; 2 = somewhat important; and 1 = not important. An investigation of rating scale diagnostics determined how well the four response options created an interpretable measure (see Table 3). By examining the shape of the observed count distribution it appears the data fall along a normally distributed curve. Using a probability curve analysis (see Figure 1) provides visual evidence that each response option forms an advancing “hill,” which indicates respondents were able to sufficiently separate response options, providing additional evidence for validity.

Table 3
Summary of Rating Scale Diagnostics

Category	Observed Count (%)	Infit Mean Square	Outfit Mean Square
Essential	15,495 (15%)	.93	.95
Very Important	35,100 (35%)	.97	.96
Somewhat Important	30,621 (30%)	.98	1.06
Not Important	19,540 (19%)	1.10	1.13

Note. Category, observed count, and percentage indicate the number of respondents who chose a particular response category, summed for each category across all 14 items.

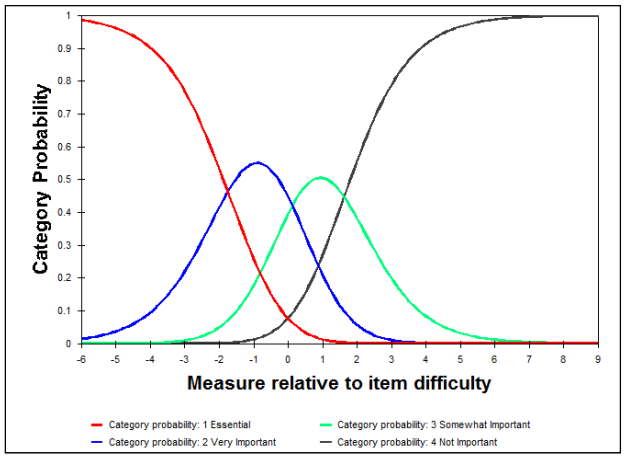

Figure 1. Probability Curve

Results

Item Maps

Item maps are useful for identifying meaningful constructs, as these graphical illustrations visually display any potential relationships among item responses. These maps display person distributions (on the left side of the map) and item distributions (on the right side of the map) along a hierarchy on a common scale. The numbers along the left column indicate logits, which are the interval level measures produced from ordinal level raw scores when data are computed via the Rasch model. These measures essentially serve as a ruler with truly equidistant values. Placing both persons and items on the same scale allows for easy and meaningful interpretation of the results. Markers denoted on the map indicate important statistics, such as the mean (*M*), one standard deviation (*SD*), and two standard deviations (*T*), for both persons and items.

Although it is possible to produce these maps with ascending or descending hierarchies, Figure 2 illustrates a top-to-bottom hierarchy. That is, persons at the top of the map had the least difficulty endorsing items, and persons at the bottom of the map had the most difficulty endorsing items. Similarly, items at the top of the map indicate they were the most difficult to endorse (or agree with), and items at the bottom of the map were the easiest to endorse. Items were coded in the map as Q1, Q2, etc., and Table 1 provides a legend with the full item stem for each item appearing on the map. According to the map, item Q6 (prepare students for family living) was the most difficult item to endorse. Conversely, item Q1 (develop ability to think clearly) was clearly the easiest item to endorse for all respondents.

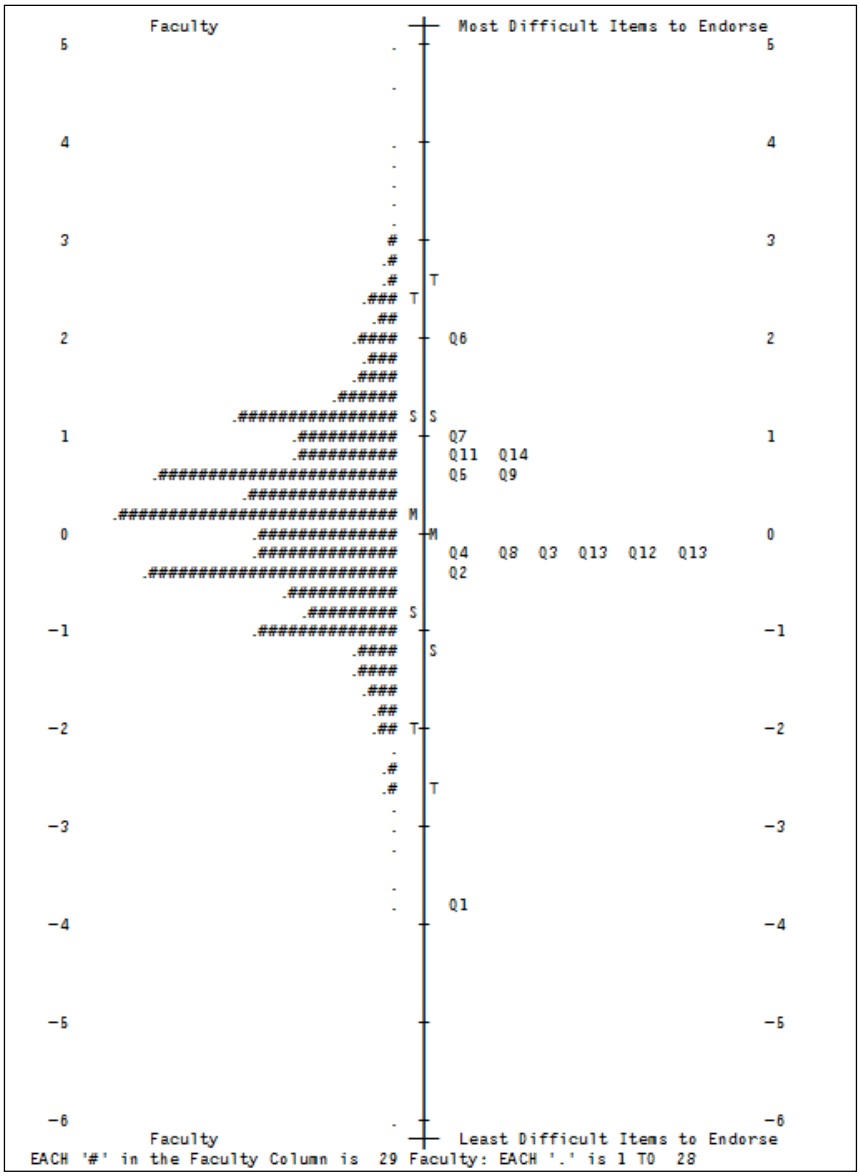

Figure 2. Item Map

The item map reveals respondents to the HERI Faculty Survey had very little difficulty endorsing item Q1 (think critically). The second easiest item to endorse was Q2 (employment after college). Items Q4 (moral character), Q8 (personal values), Q3 (prepare for graduate education), Q13 (racial/ethnic appreciation), Q12 (responsible citizenship), and Q10 (self-understanding) followed very closely with virtually identical endorsability measures. Slightly more difficult items to endorse included Q5 (emotional development) and Q9 (enhancing out-of-class experiences). The hierarchy continues upward until it reaches the most difficult item to endorse, Q6 (family living).

Construct Map

Construct maps are helpful in identifying how participants' responses compare by individual item (see figure 3). To interpret the map, a vertical line may be drawn at any given point. The extent to which items (appearing in rows) deviate from the vertical line identifies the extent to which average measures differ among items. For example, here it is evident that the same faculty who responded to item Q6 (family living) with a 1 (not important) responded to items Q3 (preparing for graduate education), Q8 (personal values), and Q13 (racial/ethnic appreciation) with a 2 (somewhat important), and item Q1 (think critically) with a 4 (essential). Items that hang together when a vertical line is produced indicate items that were endorsed in a similar manner, which often is indicative of a common theme or items that belong to a particular construct.

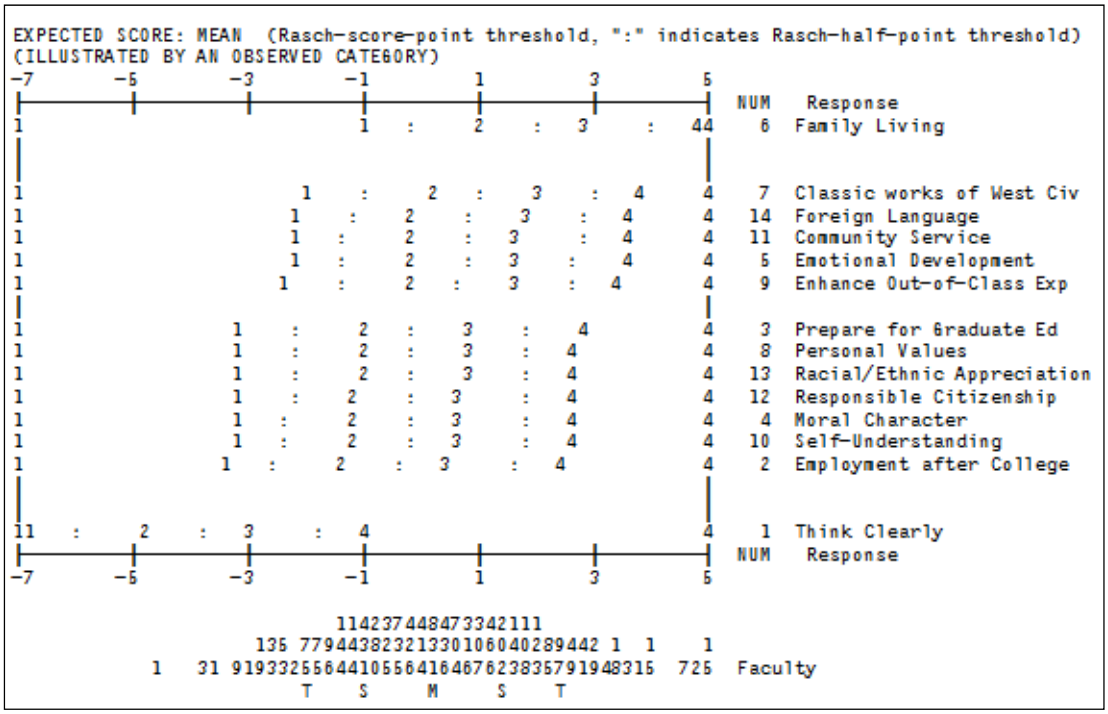

Figure 3. Construct Map

Discussion

This evaluation of faculty perceptions found faculty from virtually all disciplines are primarily concerned with the intellectual growth of students. This finding yields additional support to previous research. These findings also reveal that more than half of all university faculty are largely concerned with Q2 (employment after college), Q4 (moral character), Q8 (personal values), Q3 (prepar[ing] [students] for graduate education), Q13 (racial/ethnic appreciation), Q12 (responsible citizenship), and Q10 (self-understanding) as well. Although still moderately concerned with the following outcomes, less than half of faculty are concerned about Q5 (emotional development) and

Q9 (enhancing out-of-class experiences) outcomes. Most faculty are not very concerned with the Q6 (family living) outcome.

Numerous reasons for these differences are possible. Although this study analyzes faculty perceptions of various student learning outcomes, it is important to recognize the potential for multiple factors confounding any explanation of the results. For instance, it is important to note that 56.6% of faculty respondents report a primary interest in teaching, as opposed to research, and 84% report teaching as their principle activity. Further, previous research suggests faculty from various disciplines often incorporate different instructional techniques in their courses based on the norms of the field. Braxton and Nordvall (1985), Gaff and Wilson (1971), Lattuca and Stark (1994), and Smart and Ethington (1995) found faculty in natural and physical sciences are more likely to require memorization and application, whereas faculty in the social and behavioral sciences and humanities are more likely to address critical thinking. These differences in instructional preferences may lead to different expectations for students, which may in turn have some bearing on the importance of various instructional goals that faculty set for their students. Other possible factors may include: the extent to which teaching is valued and rewarded at various institutions; the extent to which faculty take their teaching seriously; the amount of effort faculty exert in investigating best practices in the teaching literature; and the extent to which faculty are provided, and take advantage of, professional development opportunities.

Additional issues that potentially could cloud any results include factors such as class size, course level, and specifics among demographic items. Class size could have a profound impact on the way faculty perceive various instructional goals. Faculty in smaller classes may have more opportunities to reach students in deeper, more meaningful ways than faculty who are limited to lecturing large groups of students. Similarly, course level may have some bearing on these results as well. Faculty who teach introductory level courses may face a number of different dynamics and instructional issues than faculty who teach intermediate and advanced level courses within a discipline. Because this study sought to investigate faculty perceptions of instructional goals on a macro level, any microanalyses of data would have been overwhelming. Therefore, the aforementioned factors were not controlled in the analysis of these data. Further, this study did not isolate subsets and samples of demographic characteristics (e.g., gender, age, rank) according to disciplinary affiliation and compare responses about various instructional goals. However, future research should certainly investigate such issues and questions.

Significance of Study, Implications, and Future Research

With regard to contributions, this study contributes in two key ways. First, this study revisits a dated literature and provides a large-scale evaluation on a very timely assessment issue. This study could benefit offices of assessment, institutional research and effectiveness especially, as accrediting agencies require institutions to capture data regarding nearly every facet of an institution, especially student learning outcomes. Also, understanding how faculty from various disciplines perceive a wide range of student learning

outcomes could help deans and department chairs better strategize discipline-specific learning outcomes, in addition to those outcomes that are more general in nature. Additionally, understanding such differences in perceptions could help key administrators and leaders predict how difficult each goal will be to accomplish for their given departments. Further, higher education assessment personnel regularly discuss the importance of "faculty buy-in" to assessment processes. This study suggests convincing faculty of the importance of outcomes assessment may be best accomplished through the assessment of intellectual outcomes. Finally, this study could provide some utility for those interested in tailoring teacher course evaluations (TCEs) as well.

Second, this study makes a rather unique methodological contribution to the evaluation literature. Nearly all related studies on perceptions of student learning outcomes are based on Classical Test Theory (CTT) and primarily use basic descriptive statistics, regression, and factor analyses. Arguably, Item Response Theory (IRT), particular Rasch measurement models, may provide a more informative and more comprehensive quantitative technique for studies of this nature. Furthermore, the Rasch model's stringent quality control process ensures sound measurement and data analysis, as opposed to many statistical techniques that analyze data without effectively addressing many fundamental assumptions. This study also may serve as a useful framework for other evaluation researchers wishing to conduct Rasch measurement analyses on their survey datasets.

References

Alpert, D. (1985). Performance and paralysis: The organizational context American research university. *Journal of Higher Education*, *56*, 241-81.

Andrich, D. (1978). A rating scale formulation for ordered response categories. *Psychometrika, 43,* 561-573.

Angelo, T. A., & Cross, K. P. (1993). *Classroom assessment techniques: A handbook for college teachers* (2nd ed.). San Francisco: Jossey-Bass.

Becher, T. (1987). Disciplinary shaping of the profession. In B. R. Clark (Ed.), *The academic profession: National, disciplinary, and institutional settings*. Los Angeles, CA: University of California Press.

Biglan, A. (1973a). The characteristics of subject matter in different academic areas. *Journal of Applied Psychology, 57*, 195-203.

Biglan, A. (1973b). Relationships between subject matter characteristics and the structure and output of university departments. *Journal of Applied Psychology*, *57*, 3, 204-213.

Bond, T. & Fox, C. (2001). *Applying the Rasch model: Fundamental measurement in the human sciences*. Mahwah, NJ; Lawrence Erlbaum.

Braxton, J. M., & Nordvall, R. C. (1985). Selective liberal arts colleges: Higher quality as well as higher prestige? *Journal of Higher Education, 5*, 538-554.

Clark, B. R. (1980). *Academic culture*. New Haven, CT: Higher Education Research Group, Yale University.

Donald, J. (1990). Knowledge and the university curriculum. In C. F. Conrad & J. G. Haworth (Eds.), *Curriculum in transition: Perspectives on the*

undergraduate experience. Needham Heights, MA: Ginn Press.

Fox, E. A. (1997). Examining factors which influence and significantly impact faculty teaching goals. (Doctoral dissertation, University of South Carolina, 1997) *Dissertation Abstracts International, 58*(03A), 0763.

Franklin, J., & Theall, M. (1992). *Disciplinary differences: Instructional goals and activities, measures of student performance and student ratings of instructors*. Paper presented at the meeting of the American Educational Research Association, San Francisco.

Gaff, J. G., & Wilson, R. C. (1971). Faculty cultures and interdisciplinary studies. *Journal of Higher Education, 42*(3), 186–201.

Holland, J. L. (1966). *The psychology of vocational choice*. Waltham, MA: Blaisdell.

Jervis, F. M., & Cogdon, R. G. (1958). Student and faculty perceptions of educational values. *American Psychologist, 13*, 464-66.

Kolb, D. A. (1980). Learning styles and disciplinary differences. In A. W. Chickering & Associates (Eds.), *The modern American college*. San Francisco, CA: Jossey-Bass.

Ladd, E. C., & Lipset, S. M. (1975). *Technical report: 1975 Survey of the American professorate*. Storrs, CT: The University of Connecticut, Social Science Data Center.

Lattuca, L. & Stark, J. (1994) Will disciplinary perspectives impede curricular reform? *Journal of Higher Education, 65,* 401–426.

Lawrence, J. H., Hart, K. A., Mackie, C., Muniz, D., & Dickmann, E. (1990). *A comparison of the teaching goals, assumptions, and practices of faculty in eight liberal arts disciplines*. Paper presented at the Annual Meeting of the Association for the Study of Higher Education, Portland, OR. (ERIC Document Reproduction Service No. ED 326 115)

Lee, J. J. (2004). Comparing institutional relationships with academic departments: A study of five academic fields. *Research in Higher Education, 45*(6) 603-624.

Leverenz, T. R., & Lewis, B. R. (1981). An analysis of faculty consistency in the academic professions. (ERIC Document Reproduction Service No. ED 201 254).

Liebert, R. J., & Bayer, A. E. (1975). Goals in teaching undergraduates: Professional reproductions and client-centeredness. *The American Sociologist, 10*, 195-205.

Linacre, J. M. (2010). Winsteps® (Version 3.69.1) [Computer Software]. Beaverton, Oregon: Winsteps.com.

Neumann, R., Parry, S., & Becher, T. (2002). Teaching and learning in their disciplinary contexts: A conceptual analysis. *Studies in Higher Education, 27*, 4, 405-417.

Platt, G. M., Parsons, T., & Kirshstein, R. (1976). Faculty teaching goals, 1968-1973. *Social Problems, 24*, 298-307.

Rasch, G. (1960). *Probabilistic models for some intelligence and attainment tests*. Copehagen, Denmark: Danmarks Paedogogische Institut.

Royal, K. D., Eli, J. A., & Bradley, K. D. (2010). Exploring community college faculty perceptions of student outcomes: Findings of a pilot study. *Community College Journal of Research & Practice, 34*(7), 523-540.

Royal, K. D., & Bradley, K. D. (2008). Rethinking measurement in higher education research. (ERIC Document

Reproduction Service No. ED 506 513).

Royal, K. D. (2010). Making meaningful measurement in survey research: A demonstration of the utility of the Rasch model. *IR Applications*. Available at: http://www.airweb.org/page.asp?page=566.

Smart, J. C. (2005). Attributes of exemplary research manuscripts employing quantitative analyses. *Research in Higher Education, 46*, 4, 461-477.

Smart, J. C. (1982). Faculty teaching goals: A test of Holland's theory. *Journal of Educational Psychology, 74*(2), 180-188.

Smart, J. C., & Elton, C. F. (1975). Goal orientations of academic departments: A test of Biglan's theory. *Journal of Applied Psychology, 60*, 580-588.

Smart, J. C. & Ethington, C.A. (1995) Disciplinary and institutional differences in undergraduate education goals. In N. Hativa & M. Marincovich (Eds.), *Disciplinary differences in teaching and learning: Implications for practice* (pp. 49–57). San Francisco, CA: Jossey-Bass.

Smart, J. C., Feldman, K. A., & Ethington, C. A. (2000). *Academic disciplines: Holland's theory and the study of college students and faculty*. Nashville, TN: Vanderbilt University Press.

Stark, J. S., & Morstain, B. R. (1978). Educational orientations of faculty in liberal arts colleges: An analysis of disciplinary differences. *Journal of Higher Education, 49*, 420-437.

Swenson, C. D. (1997). Teaching goals of practitioner-educators: Improving teaching and learning in continuing higher education. *Continuing Higher Education Review, 61*, 88-103.

Wilson, R. C., Gaff, J. G., Dienst, E. R., Wood, L., & Bavry, J. L. (1975). *College professors and their impact on students*. New York, NY: Wiley.