LEARNING OUTCOMES

Bowman, N. (2010). Can first-year college students accurately report their learning and development? *American Educational Research Journal*, 47, pp. 466-496.

In order to examine the accuracy of self-reported student gains, this study compared student self-reported data to longitudinal data measuring the same construct but obtained through a previously validated test. A sample of 3,072 students (drawn from the Wabash Study) was asked to offer self-reported gains in critical thinking, personal code of values, understanding people of differing backgrounds, and self-understanding. Four corresponding longitudinal measures were employed, two objective and two subjective: CAAP Critical Thinking module (critical thinking, objective); Defining Issues Test 2 (personal code of values, objective); Relativistic appreciation subscale of the Miville-Guzman University-Diversity scale (understanding people of differing backgrounds, subjective); Consciousness of self subscale of the Socially Responsible Leadership Scale (self-understanding, subjective). After controlling for a number of independent variables (demographics, precollege characteristics, institutional type, curricular/cocurricular experiences), ordinary least squares (OLS) multiple regression analyses revealed low correlations between self-reported and longitudinal student gains, especially when longitudinal measures were objective rather than subjective in nature. Findings suggest that students are not accurate judges of how their personal attributes have changed over time.

Carini, R.M., Kuh, G.D., & Klein, S.P. (2006). Student engagement and student learning: Testing the linkages. *Research in Higher Education*, *47*(1), 1-32.

Using a set of cognitive and performance tests recently developed by The RAND Corporation and self reported data from the NSSE, this study sought to understand what forms of student engagement are most closely related to student learning and to determine if particular postsecondary types are more successful at realizing academic gains through student engagement. Analysis of a sample of 1,058 students at 14 institutions yielded small yet statistically significant positive partial correlations between six engagement constructs (level of academic challenge, supportive campus climate, reading and writing, quality of relationships, institutional emphasis on good practices, and general education gains) and student scores on the RAND tests. Examination of partial correlations between individual engagement items and RAND scores revealed that student engagement yielded differential academic outcomes by year in school. In particular, first-year students benefited academically from having shorter writing assignments, coming to class prepared, having high quality relationships with faculty and administrative personnel, and exceeding personal work expectations, while seniors benefitted academically from group projects, integrated curricula, high quality academic advising, contact with students of different backgrounds, and attending campus activities. In addition, results

show that low-ability students (SAT < 1030) benefitted more academically from high engagement than their high-ability peers (SAT > 1330). Finally, multivariate regression analysis supported the claim that the relationship between student engagement and academic performance varies by institution, suggestion that some colleges are more successful at converting engagement into achievement.

Colbeck, C.L., Campbell, S.E., & Bjorklund, S.A. (2000). Grouping in the dark: What college students learn from group projects. *Journal of Higher Education, 71*(1), 60-83.

Conducting interviews and focus groups of 65 engineering students at 7 institutions, this study examined undergraduate perceptions of how group participation cultivated professional skills. Qualitative data analysis revealed three major findings. First, team interdependence occurred more often when members had prior team experience (through paid work experience, corporate internships, group work in previous classes, etc.) and when students were given "real world projects" and had the opportunity to interact with industry representatives. Second, prior experiences as well as individual course factors influenced the types of interdependence each team developed (i.e., goal and reward interdependence, role interdependence, resource interdependence). Finally, student participants perceived that their experience in teams fostered the professional skills of communication, conflict management, and problem-solving.

Cruce, T.M., Wolniak, G.C., Seifert, T.A., Pascarella, E.T. (2006). Impacts of good practices on cognitive development, learning orientations, and graduate degree plans during the first year of college. *Journal of College Student Development, 47*(4), 365-383.

This study examined the effects of Chickering and Gamson's 7 principles for good practice (student-faculty contact, cooperation among students, active learning, prompt feedback, time on task, high expectations, and respect for diverse talents and ways of learning) in undergraduate education on student cognitive development, orientations to learning, and educational aspirations during the first year of college. Using a sample of 2,474 students at 23 institutions (18 four-year and 5 two-year; 5 liberal arts colleges, 4 research I or II universities, 7 comprehensive universities, and 2 HBCUs) authors employed a longitudinal design in which participants completed the CAAP (pre and post), NSSL (pre and post), and CSEQ (post only). Logistic regression results revealed that students who experienced the principles for good practice were more likely to realize modest, yet significant, gains in their orientations to learning and cognitive development. Moreover, analysis of conditional effects suggested that students entering college with below average scores on cognitive ability and orientation to learning measures realized greater gains from experiencing the principles of good practice than their higher-scoring peers.

Inkelas, K.K., Soldner, M.M, Longerbeam, S.D., & Leonard, J.B. (2008). Differences in student outcomes by types of living–learning programs: The development of an empirical typology. *Research in Higher Education, 49*(6), 495-512.

Using data from the National Study of Living-Learning Programs that included 23,910 students in 297 living-learning (L/L) programs on 34 campuses, this study attempted to understand the relationship between L/L type and student outcomes. First, a two-step cluster analysis yielded three types of L/L programs: small, limited resource, primarily residential life emphasis; medium, moderately resourced, student affairs/academic affairs combination; large, comprehensively resourced, student affairs/academic affairs collaboration. Next, after controlling for student entry characteristics and institutional selectivity and size, a hierarchical multiple regression analysis revealed that program size did predict for greater gains in student outcomes. In particular, student participation in large L/L programs predicted for greater self-reported growth in critical thinking than participation in medium or small L/L programs. Moreover, student participation in medium L/L programs predicted for less self-reported growth in overall cognitive complexity and appreciation for liberal learning than participation in large or small L/L programs. Findings suggest that under-resourced L/L programs without a strong connection to academic and student affairs are likely to lack effectiveness.

Kember, D., Leung, D.Y.P., & Ma, R.S.F. (2007). Characterizing learning environments capable of nurturing generic capabilities in higher education. *Research in Higher Education, 48*(5), 609-632.

Against the backdrop of the transformation from an industrial to information economy, this article investigates how certain educational environments foster the development of generic capabilities for lifelong learning (i.e., higher-order thinking skills). Using a sample of 1,756 undergraduates at a university in Hong Kong, this study employed a mixed-method approach which included a survey to collect self-reported data regarding student learning outcomes and their learning environment as well as qualitative interviews and focus groups to provide depth to quantitative data. Results of structural equation modeling suggested that student acquisition of generic capabilities for lifelong learning can be fostered by learning environments characterized by positive teaching (active learning, teaching for understanding, assessment, coherence of curriculum) and supportive teacher-student (teacher-student interaction, feedback to assist learning, assistance from teaching staff) and student-student (relationship with other students, cooperative learning) relationships. Moreover, results of qualitative inquiry supported the conclusion that the educational environment can affect perceptions of cognitive development among students.

Klein, S.P., Kuh, G.D., Chun, M., Hamilton, L., Shavelson, R. (2005). An approach to measuring cognitive outcomes across higher-education institutions. *Research in Higher Education*. *46*(3), 251-276.

This study assesses the feasibility of large-scale use of direct measures of student learning (i.e., open-ended) for determining if a "value added" effect exists across institutions. Using a sample of 1,365 students from 14 institutions– participants were asked to complete a battery of measures: four 90 minute critical thinking tests developed by the New Jersey Department of Education, two 90 minute constructed response tasks modeled after the performance test section of the bar exam, a task evaluation questionnaire, and the NSSE. Statistical analysis revealed a high level of reliability between human and computer scoring of open-ended tests of cognition when aggregated to the institutional level, suggesting that these tests could be used as an efficient method for obtaining accurate measures of student learning outcomes. In addition, after controlling for incoming SAT scores, cross-sectional analysis revealed that the tests employed were sensitive to changes in student learning over time, suggesting that these measures could be used to assess the educational "value added" of particular institutions.

Lundberg, C.A., & Schreiner, L.A. (2004). Quality and frequency of faculty-student interaction as predictors of learning: An analysis by student race/ethnicity. *Journal of College Student Development*, *45*(5), 549-565.

Using a sample of 4,501 undergraduates who completed the College Student Experiences Questionnaire (CSEQ), this study sought to understand how faculty-student interaction varies by race and to determine if that interaction predicts for student learning. After controlling for a number of student background variables (age, gender, year, major, first-generation, advanced degree plans, financial support, hours working, and institutional selectivity), the study operationalized two faculty interaction independent variables: 1) frequency of experiences with faculty (13 items, including academic interactions, personal interactions, and social interactions); 2) quality of relationships with faculty (measured by one self-assessment item). Student learning (the dependent variable) was operationalized through a composite variable using the mean of 25 items having a Chronbach's alpha of .92. Multivariate analysis of covariance (MANCOVA) revealed that though quality of relationships with faculty (especially interactions with faculty members who encourage students to work harder) significantly predicted learning for all racial/ethnic groups, it was a particularly strong predictor for students of color. Study results also confirmed that quality of faculty-student interactions varied by race, with white students reporting the most favorable perceptions.

Mayhew, M.J., Vanderlinden, K, & Kim, E.K. (2010). A multi-level assessment of the impact of orientation programs on student learning. *Research in Higher Education, 51*(4), 320-345.

New student orientation programs are common co-curricular institutional interventions aimed at fostering student academic and social success. Using a multi-institutional survey that yielded self-reported data from 14,208 students at 35 institutions, hierarchical linear modeling revealed that institutions having a dedicated office for orientation programming positively affected the ability of first-year students to acquire characteristics associated with academic success, such as time management, study skills, personal adjustment to the academic rigors of college, and a better sense of faculty expectations. Study results also showed that student social and academic outcomes varied by individual level characteristics (e.g., race, transfer status, international status), suggesting that students from varying backgrounds have differential orientation experiences.

Pascarella, E.T., Seifert, T.A., & Blaich, C. (2010). How effective are the NSSE benchmarks in predicting important educational outcomes? *Change* (January-February), 16-22.

After providing a brief overview of the precursors to the postsecondary accountability movement, this study examined whether or not the NSSE Benchmarks of Effective Educational Practice (Level of Academic Challenge, Active and Collaborative Learning, Student-Faculty Interaction, Enriching Educational Experiences, Supportive Campus Environment) are actually related to student learning outcomes. Using longitudinal data (freshman to sophomore year) obtained by the Wabash National Study of Liberal Arts Education, the authors tested relationships between the NSSE benchmarks and five of the seven liberal arts outcomes examined by the Wabash study: Effective Reasoning and Problem Solving (32-item Critical Thinking Test of the CAAP), Moral Character (N2 score of the Defining Issues Test), Inclination to Inquire and Lifelong Learning (18-item Need for Cognition Scale & 6-item Positive Attitude toward Literacy Scale), Intercultural Effectiveness (15-item Miville-Guzman Universality-Diversity Scale & 7-item Openness to Diversity/Challenge Scale), and Personal Well-Being (54-item Ruff Scales of Psychological Well-Being. The mean for all partial correlations was a statistically significant ($p = .001$) value of 0.34, supporting the claim that the NSSE benchmarks can serve as proxy measures for student learning outcomes. Moreover, four of the five NSSE benchmarks (Student-Faculty Interaction excepted) evidenced significant partial correlations with at least one of the five liberal arts outcomes examined.

Pike, G.R., & Killian, T.S. (2001). Reported gains in student learning: Do academic disciplines make a difference? *Research in Higher Education, 42*(4), 429-454.

This study used Biglan's typology of pure and applied disciplines to investigate differences in college experience and learning outcomes. A sample of 598 students attending an AAU public university in the Midwest completed the CESQ survey, whose items were used to form five latent constructs (perceptions of the college environment, academic involvement, social involvement, integration of information, and perceptions of personal gains in learning). Structural equation modeling results revealed that perceptions of the college environment evidenced a direct and significant, positive relationship with learning gains, while academic and social involvement improved integration of information and thereby provided an indirect yet significant, positive relationship with learning gains as well. Model intercepts varied according to discipline type, with analysis of covariance indicating that students in applied disciplines perceived greater gains in their general education and vocational competence than their peers in pure disciplines. Moreover, students in applied disciplines had a more favorable view of the college environment, while students in pure disciplines indicated greater academic and social involvement.

Schönwetter, D.J., Clifton, R.A., & Perry, R.P. (2002). Content familiarity: Differential impact of effective teaching on student achievement outcomes. *Research in Higher Education, 43*(6), 625-655.

Using a volunteer sample of 481 students from an introductory psychology course at a research university in the midwest, the authors constructed a simulated classroom setting to test how two factors of the lecture method of instruction, organization (characterized by lecture outlines, topic transitions, etc.) and expression (characterized by eye contact, physical movement, etc.), differentially affect content-familiar (prior content knowledge) and content-unfamiliar (no prior content knowledge) students. After watching a lecture on video, participants completed a questionnaire regarding self perceptions of achievement, an open-ended content recall test, and a multiple-choice achievement test. Stepwise regression results reveal that organization and expression both exert a significant positive influence on the perceived learning of content-unfamiliar students, while only expression has a significant positive effect on the perceived learning of content-familiar students. Results also reveal that only organization demonstrated a significant positive influence on the actual learning of content-unfamiliar students, while neither organization nor expression demonstrated a significant influence on the actual learning of content-familiar students.

Seifert, T.A., Pascarella, E.T., Colangelo, N., Assouline, S.G. (2007). The effects of honors program participation on experiences of good practices and learning outcomes. *Journal of College Student Development, 48*(1), 57-74.

This study hypothesized that students in honors programs would be more likely to experience Chickering & Gamson's (1987, 1991) good practices (student-faculty interaction, cooperative learning, active learning, prompt feedback, high expectations, quality of teaching, influential interactions with other students) and evidence higher cognitive gains than their non-honors peers in the first year of college. Using a sample of 2,000 students at 18 institutions, researchers employed the NSSL & CSEQ to assess good practices and the CAAP to assess cognitive gains. Findings demonstrated that honors participation resulted in greater exposure to 6 of 20 good practices in undergraduate education as well as a modest but significant difference in cognitive gains.

Toutkoushian, R., & Smart, J. (2001). Do institutional characteristics affect student gains from college? *Review of Higher Education, 25*(1), 39-61.

This study sought to understand how institutional expenditures per student (level of spending per student and percentages of expenditures devoted to: faculty salaries and teaching supplies; academic advising/counseling; and administrative support) exhibit influence student perceptions of gains in five learning outcomes: interpersonal skills, learning/knowledge, tolerance/awareness, graduate/professional school preparation, and communication skills. Longitudinal data was obtained from a random sample of 2,269 students at 315 institutions who had completed both the first-year and follow-up surveys of the Cooperative Institutional Research Program (CIRP). Institutional level data was derived from HEGIS/IPEDS. After controlling for student background characteristics (race/ethnicity, family income, gender, first-generation, self-reported high school GPA, self-reported motivation for attending college) as well as student-acquired characteristics (time allocation – in class, studying, working, socializing – and percentage of years living on campus), multiple regression analysis revealed that higher per-student expenditures are positively related to self-reported student gains in interpersonal skills and learning/knowledge acquisition. Moreover, analyses revealed that student gains differed depending on how the expenditures were allocated. Students reported higher gains in learning/knowledge acquisition when a high proportion of funds were allocated to administrative support, while they reported lower gains in learning/knowledge acquisition and communication skills when a high proportion of funds were allocated to academic advising/counseling. The proportion of expenditures allocated to faculty salaries and teaching supplies did not appear to have any measurable effect on gains in student learning outcomes. In addition, students attending highly selective institutions reported higher gains in communication skills but lower gains in interpersonal skills, while students attending less selective institutions

reported higher gains in tolerance/awareness. Finally, results suggest that higher student-faculty ratios are detrimental to student gains on only one learning outcome, communication skills.

Tsui, L. (2002). Fostering critical thinking through effective pedagogy: Evidence from four institutional case studies. *Journal of Higher Education*, *73*(6), 740-763.

This study employed the case study method at 4 institutions, collecting qualitative data through classroom observations, focus groups, informal interviews and document analysis. It sought to understand the effect of classroom pedagogy on cognitive development. Findings suggest that an emphasis on writing and classroom discussion fosters critical thinking in students.

Wolf-Wendel, L., Ward, K., Kinzie, J. (2009). A tangled web of terms: The overlap and unique contribution of involvement, engagement, and integration to understanding college student success. *Journal of College Student Development*, *50*(4), 407-428.

Using a qualitative methodology relying upon literature review and expert interviews, this piece attempts to distinguish the meanings of three popular constructs in higher education research: involvement, engagement, and integration. Phase one interviews of Alexander Astin, George Kuh, and Vince Tinto provided initial definitions of terms, while phase two interviews of Larry Braskamp, John Braxton, Shaun Harper, Sylvia Hurtado, Ernest Pascarella, Linda Sax, and Frances Stage shed light on how these constructs have been applied in subsequent research. Study results reveal that while the three terms overlap conceptually, they also make unique contributions. Involvement focuses on the settings and activities in which students participate and has been empirically connected to a multitude of positive postsecondary outcomes. Engagement deals with institutional efforts to direct student participation toward educational best practice. Integration refers to the reciprocal relationship between student and institution, whereby the student attempts to acculturate to the college environment and the institution offers opportunities for new students to develop a sense of belonging.