How well does engagement as measured by NSSE relate to persistence to the second year and degree progress through the second year?

Purpose

Engagement is defined by educational practices that are associated with learning and development during college. Thus, evidence of validity should be found in the ability of NSSE's engagement measures to predict college success indicators, while recognizing that results may vary considerably based on the outcomes chosen. With these things in mind, we address the following research questions:

1) What is the relationship between student engagement and persistence?
2) What is the relationship between student engagement and credit hours earned?
3) Do these relationships differ by ability, and if so, which ability groups have stronger relationships than others?

Data

This analysis was based on approximately 4,000 first-year NSSE respondents from the Wabash National Study of Liberal Arts Education (http://www.liberalarts.wabash.edu/), a longitudinal study aimed at better understanding the relationship between liberal arts educational outcomes and various college experiences. Of this sample, 62% were female, 19% underrepresented minorities, 99% traditionally aged (19 years old or younger) and 99.5% were enrolled full-time. These students came from 22 four-year baccalaureate granting institutions and started college in fall 2006 or fall 2007. Among these institutions, there were five research universities, five master's colleges and universities, eleven baccalaureate colleges (arts & sciences), and one school of business and management. NSSE data was collected for these two first-year cohorts in the spring 2007 and spring 2008, and subsequently merged with the larger Wabash study data set that would eventually include the outcome information used in this analysis.

We focused on the relationships between measures of student engagement as reported during the spring of the first year, and two outcome measures: (1) persistence between the second and third semester, and (2) cumulative credits earned by the end of the second year. NSSE measures used for this study included the five benchmarks of effective educational practice (Level of Academic Challenge, Active and Collaborative Learning, Student-Faculty Interaction, Enriching Educational Experiences, and Supportive Campus Environment) and Deep Approaches to Learning. For a list of individual items used to create each NSSE measure, item inter-correlations, and alpha reliability statistics, click on the following link. For additional descriptive statistics on outcome and ability measures, see the appendix.

This report is part of NSSE's *Psychometric Portfolio,* a framework for presenting our studies of the validity, reliability, and other indicators of quality of NSSE data, available online at **nsse.iub.edu/links/psychometric_portfolio**.

Methods

In this analysis, we address the research questions using a combination of both descriptive and statistical model results. By doing this, we provide results that are intended to be relatively simple to understand, but that have also received more statistical scrutiny.

As a first step, using NSSE 2008 normative information, we categorized students into three percentile groups for each engagement measure: lowest quartile, middle 50%, and upper quartile. Then we developed line graphs plotting average 2nd to 3rd semester persistence rates and cumulative credit hours earned by the end of the second year. Additional lines were also included to show this relationship for three different pre-college ability groups based on ACT and SAT composite scores: lowest quartile, middle 50%, and upper quartile. These ability groupings were based on the distribution of Wabash-NSSE respondents only.

We then developed logistic regression models for persistence, and OLS models for credits hours earned. All NSSE measures and ability scores were standardized before entering into the models to make results interpretation easier. Hence, logistic regression coefficients could be interpreted, for example, as "the odds of being retained are 10% greater" or, as with OLS coefficients, "1.3 additional credit hours earned" given a one standard deviation NSSE measure increase.

We summarize findings for each measure based on the descriptive graphical information, and comment on statistical models when their results might lead to different conclusions. Using both approaches together, we hope to provide a more nuanced picture of these relationships. For example, though statistical models may not show a statistically significant interaction between a NSSE measure and ability, this may obfuscate interesting differential descriptive results across ability groups.

Data tables and statistical model results can be found in the appendix.

Results

Level of Academic Challenge (LAC). Persistence rates and credit hours earned increase as coursework becomes more rigorous and challenging. As illustrated in the graphs below, the average persistence rate difference between those in the bottom and top quartiles was seven percent (89% versus 96%), while the average credit hours earned differed by five (56 versus 61).
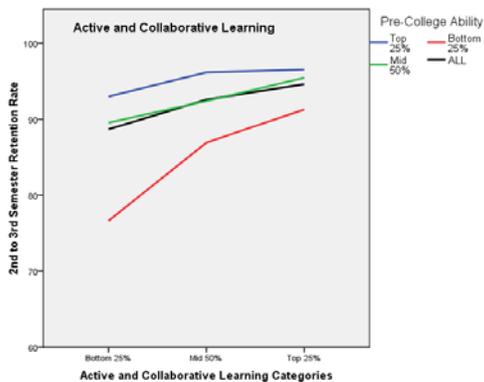
Persistence
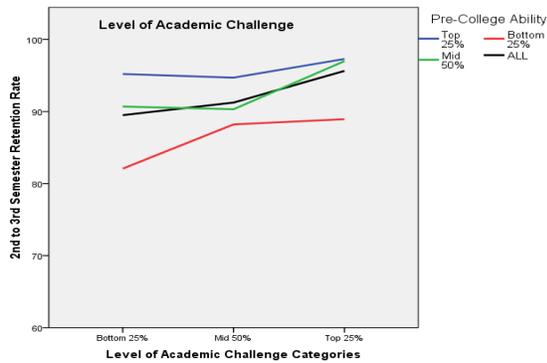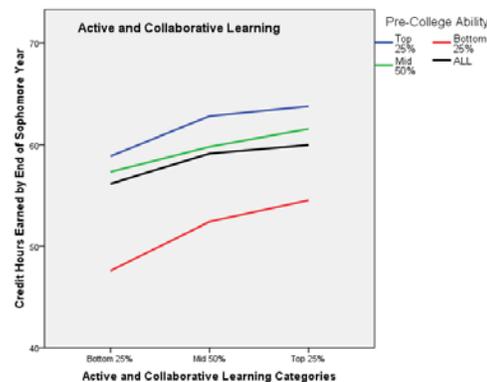
Credit Hours Earned
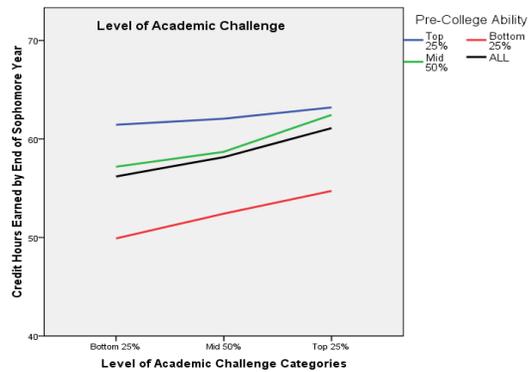
For both outcome measures, this general positive relationship appears to hold for all three ability groups, but the strength of the relationship appears stronger for the bottom quartile and middle ability groups. There is a statistically significant interaction between LAC and ability when modeling credit hours, but not for persistence.

Active & Collaborative Learning (ACL). Data suggest persistence rates and credit hours earned increase as students experience more active and collaborative learning. As the following graphs demonstrate, the average persistence rate difference between those in the bottom and top quartile is 6% (89% versus 95%), while the average credit hours earned differs by four (56 versus 60).

Persistence
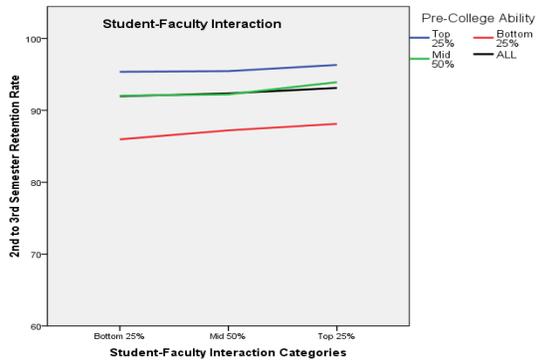
Credit Hours Earned

For both outcome measures, this general positive relationship appears to hold for different ability levels, but the strength of the relationship appears much stronger for the bottom quartile group. Statistical models suggest no statistically significant interaction exists between ACL and ability for either outcome though.

Student-Faculty Interaction (SFI). The frequency of faculty interactions does not appear to be related to persistence. The statistical model for persistence suggests a statistically significant, weak relationship, however descriptive results do not show much evidence of a meaningful association (see below). Overall, persistence rates for each SFI grouping is around 93%. Furthermore, we see no noticeable interaction with ability. On the other hand, average credit hours earned does appear to be related to SFI. While the bottom quartile earns on average 57 credit hours, the top quartile earns 60. Though statistical models do not suggest any interactions with ability, Wabash data indicate this relationship is

stronger for students in the top ability quartile. For the top ability group, the bottom and top SFI quartiles are separated by four credit hours earned on average, while only two credit hours separate them for the bottom ability group.

Persistence   Credit Hours Earned
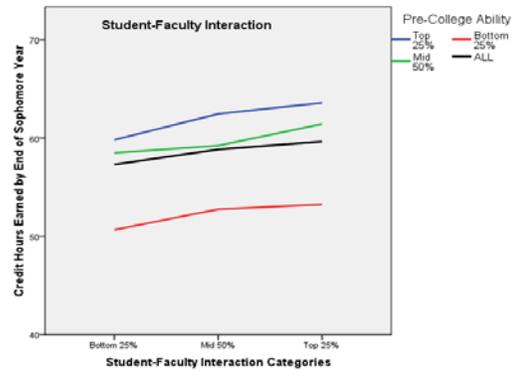
Supportive Campus Environment (SCE). The more first-year students perceive their campus as a supportive environment, the more likely they will persist to the second year and earn additional credit hours. The average persistence rate difference between those in the bottom and top quartile is 9% (86% versus 95%), while the average credit hours earned differs by five (55 versus 60).
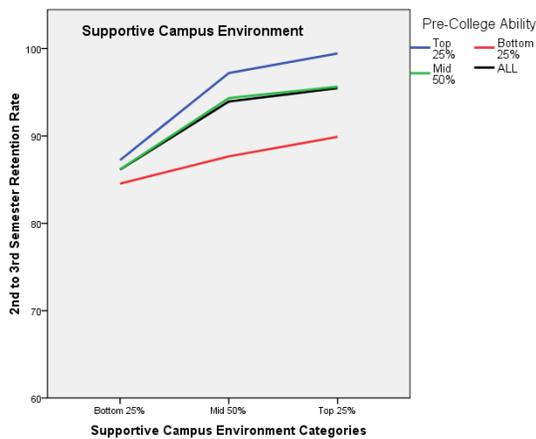
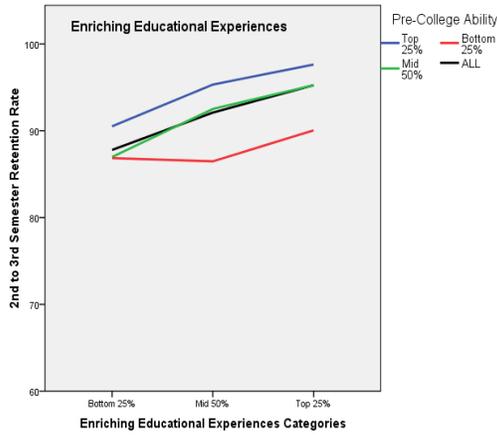Persistence   Credit Hours Earned
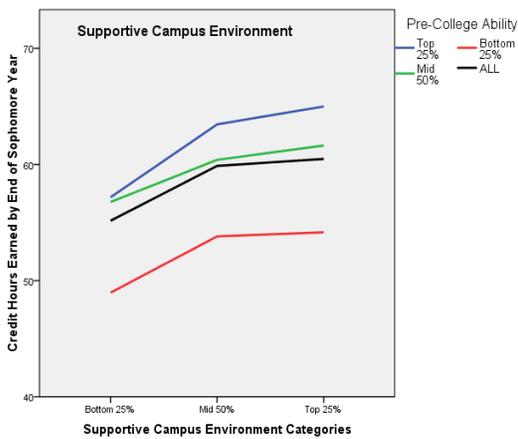
We find this relationship with both outcomes for all three ability levels, but it appears strongest for the top quartile groups. Statistical models also suggest a statistically significant interaction effect between SFI and ability.

Enriching Educational Experiences (EEE). First-year students from the Wabash study that experienced more enriching educational experiences were also more likely to persist and make greater progress towards their degree. The average difference in persistence rate between those in the bottom and top quartile is 7% (88% versus 95%), while the average credit hours earned differs by six (55 versus 61).

Persistence

Credit Hours Earned
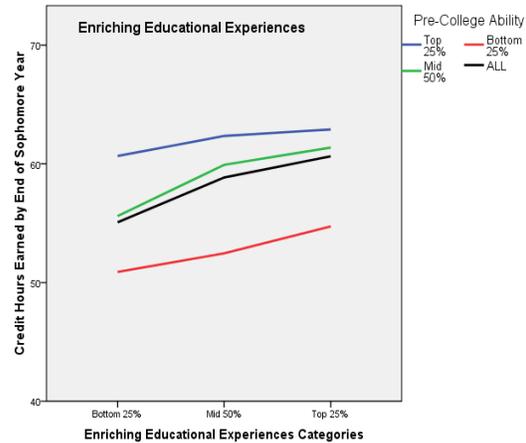
This positive relationship is consistent across ability levels, though the patterns of effects are different between the two outcomes. For persistence, respondents from the top quartile and middle 50% of ability scores show a stronger relationship than their bottom quartile peers. For credit hours earned, the data suggests that students from the bottom ability quartile and the middle 50% grouping have a stronger relationship than those from the top ability quartile. Statistical models, however, suggest no statistically significant interaction between EEE and ability when predicting degree progress.

Deep Approaches to Learning (DAL). Students who practice deep approaches to learning more often have slightly greater retention rates and earn slightly more credit hours than others. The average difference in persistence rate between those in the bottom and top quartiles is 3% (91% versus 94%), while the average credit hours earned differs by three (57 versus 60).

Persistence
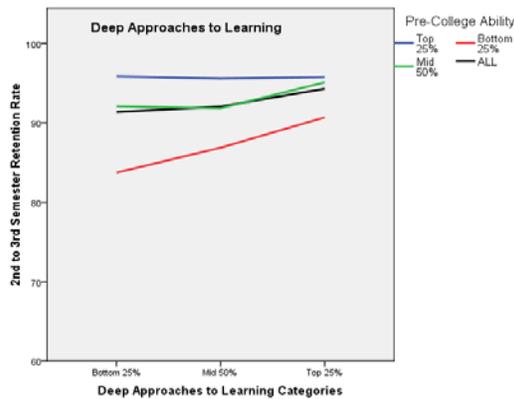
Credit Hours Earned
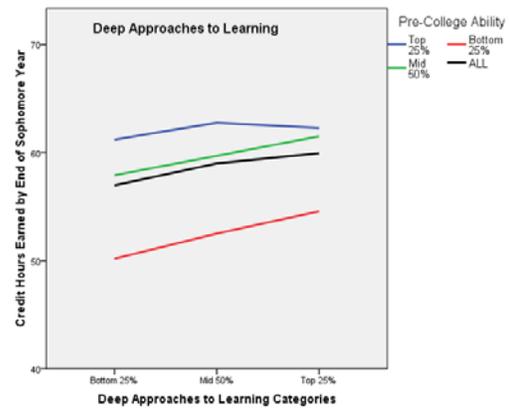
These relationships appear to vary by ability level. Compared to the middle 50% and top quartile ability groups, students from the bottom quartile appear to persist at greater rates as DAL practices increase. In fact, the top ability quartile shows no change as DAL practices increase in frequency. Statistical model results actually suggest no statistically significant interaction effect is present. With regard to credit hours earned, the strength of the relationship for the middle 50% and bottom quartile for ability is noticeably stronger than the relationship for the top quartile, and the related statistical model shows a statistically significant interaction between DAL and ability as well.

Conclusion

As this study demonstrates, the majority of NSSE measures do relate to important undergraduate educational outcomes, and these relationships are often influenced by pre-college academic ability. However, keep in mind that no one should expect *every* NSSE measure to strongly relate to *every* desirable higher education outcome. Results of this analysis should also be evaluated holistically with other validity and reliability evidence before drawing conclusions about a measures utility.

References

NSSE Psychometric Portfolio. (2009). Bloomington, IN: Center for Postsecondary Research, Indiana University, School of Education. www.nsse.iub.edu

NSSE Psychometric Validity Framework. (2009). Bloomington, IN: Center for Postsecondary Research, Indiana University, School of Education. www.nsse.iub.edu