

## Psychometric Properties of NSSE

### How and why was the survey developed?

The National Survey of Student Engagement (NSSE) was designed to assess the extent to which students participate in empirically-derived effective educational practices and what they gain from their college experience. A large, growing body of research on college student development shows that the time and energy students devote to educationally purposeful activities contributes to their learning and personal development (See NSSE Conceptual Framework at [www.nsse.iub.edu/html/researchers.cfm](http://www.nsse.iub.edu/html/researchers.cfm) for more details). The NSSE survey reports student behaviors that are highly correlated with many desirable learning and personal development outcomes of college education.

### What does the instrument cover?

NSSE asks students to report how often they participate in activities that represent good educational practice. The survey also covers students' perceptions of the college environment associated with achievement and satisfaction. In addition, students are asked to estimate their educational and personal growth since starting college. Finally, students provide information about their background, including age, gender, race or ethnicity, living situation, educational status, and major.

### Can we trust student self-reported data?

The validity and credibility of self-reports have been examined extensively. Self-reported data are likely to be valid under five general conditions: (1) when the information requested is known to the respondents; (2) the questions are phrased clearly and unambiguously; (3) the questions refer to recent activities; (4) the respondents think the questions merit a serious and thoughtful response; and (5) answering the questions does not threaten, embarrass, or violate the privacy of respondents or encourage respondents to respond in socially desirable ways (See NSSE Conceptual Framework at [www.nsse.iub.edu/html/researchers.cfm](http://www.nsse.iub.edu/html/researchers.cfm) for references and more details). NSSE was intentionally designed to satisfy all these conditions.

### Does the instrument yield valid information?

The NSSE design team worked diligently to ensure that survey items were clearly worded, well-defined, and had high content and construct validity. Logical relationships exist between the items that are consistent with the results of objective measures and other research. The responses to survey items are approximately normally distributed and the patterns of responses to different clusters of items discriminate among students both within and across major fields and institutions.

Overall, the pattern of responses from first-year students and seniors suggests the items are measuring what they are supposed to measure. For example, as one would expect, seniors are, on average, more engaged in their educational pursuits compared with first-year students. They also report that their coursework places more emphasis on higher order intellectual skills, such as analysis and synthesis as contrasted with memorization. Using NSSE 2005 data, we found only two activities that first-year students reported doing more often than seniors. The first is preparing two or more drafts of a paper or assignment before turning it in. A possible explanation is that first-year students are more likely to take classes that require multiple drafts of papers, or because seniors have become better writers during college and need fewer drafts to produce acceptable written work. The second item is related to interactions with peers of different religious beliefs, political opinions, or personal values. A possible explanation is that first-year students are more likely than seniors to live in campus housing which puts them in close proximity to peers from different backgrounds. Overall, the items on the survey appear to measure what they are intended to measure and discriminate among students in expected ways.


### Are students' responses to the survey reliable?

Student responses to the survey are reliable to the extent that they are consistent and reproducible. Research analysts at NSSE examined the reliability of student responses in two ways: test-retest analysis at the student level and stability analysis at the institution level.

### **Test-retest analysis**

Assuming little variation in student behavior between the test and retest, we would expect consistent or reliable responses to the survey items. In 2002, we conducted a test-retest analysis using 1,226 respondents who completed the same form of the paper survey twice over a period of several months. For the students' responses on the items related to three of the benchmarks (i.e., level of academic challenge, active and collaborative learning, and enriching educational experiences), the reliability coefficients were 0.74. Student responses for the items related to student interaction with faculty members and to supportive campus environment had reliability coefficients of 0.75 and 0.78, respectively. In 2005, we conducted the study again using 1,536 respondents who completed the paper or Web survey twice within a period of several months. The results were similar to the earlier study with the reliability coefficients ranging from 0.69 (level of academic challenge) to 0.74 (enriching educational experiences). The following table shows the test-retest analysis results from 2002 and 2005 NSSE survey administration. These findings suggest little variation in student responses from one testing period to the next.

Benchmarks	Test-retest Correlations	
	2002	2005
Level of Academic Challenge	0.74	0.69
Active and Collaborative Learning	0.74	0.72
Student-Faculty Interaction	0.75	0.70
Enriching Educational Experiences	0.74	0.74
Supportive Campus Environment	0.78	0.70
N	1226	1536



### **Stability analysis**

Assuming no major shifts in an institution's policies, we would expect an institution to have relatively stable or reliable benchmark scores from one year to the next. In 2003, we conducted a stability analysis to measure the strength of the associations between benchmark scores for 214 institutions that participated in the 2002 and 2003 administrations of the survey. The benchmark scores were calculated using unweighted student responses to survey items that were similar for the two years. Values of the Spearman's rho correlations for these benchmark scores ranged from 0.81 (student-faculty interaction) to 0.88 (level of academic challenge) for first-year students, and from 0.83 (active and collaborative

learning) to 0.93 (enriching educational experiences) for seniors. We conducted this study again using the 2004 and 2005 NSSE survey data from 236 institutions that participated in both the 2004 and 2005 NSSE survey administrations. The results of the study showed the Spearman's rho correlations ranged from 0.78 (student-faculty interaction) to 0.89 (enriching educational experiences) for first-year students, and from 0.78 (active and collaborative learning) to 0.92 (enriching educational experiences) for seniors. Our study also showed that NSSE benchmarks were highly stable for both Predominantly White Institutions and Minority-Serving Institutions. These findings suggest that institution-level NSSE data are relatively stable from year to year. At the same time, it is possible that results for a given institution may vary substantially from one administration to another; this is more likely to occur for schools that have a small number of respondents.

### **Do non-respondents differ from respondents?**

To determine whether respondents and non-respondents differed in their engagement in selected effective educational practices, the Indiana University Center for Survey Research conducted telephone interviews with 553 non-respondents from 21 different colleges and universities that participated in the NSSE 2001 survey administration. A similar study was conducted again in the NSSE 2005 survey administration with 1,400 non-respondents from 24 different colleges and universities. In addition, we also conducted a non-response study by comparing NSSE 2005 benchmark scores of early and late respondents. Although some differences were found between respondents and non-respondents, no consistent trend was found to support the existence of non-response bias. Generally speaking, undergraduate students who do not complete the NSSE survey when invited to do so may actually be slightly more engaged than respondents. This is counter to what many observers believe, that non-respondents have a less educationally productive experience and, as a result, do not respond to surveys. The findings suggest that the opposite may be true, that non-respondents are busier in many dimensions of their lives and do not take time to complete surveys. The results of the non-response and early-late respondent study show no significant sign of non-response bias in NSSE.

### **Do students respond differently depending on mode of administration (paper vs. Web)?**

Using ordinary least squares (OLS) we analyzed NSSE 2000 data to ascertain whether students who completed the survey on the Web responded differently than those who responded via a traditional paper format. We controlled a variety of student and institutional characteristics that may be associated with either engagement or mode. Responses to Web and paper surveys showed

small, but consistent, differences that tended to favor the Web mode where differences existed. Items related to computing and information technology exhibited some of the largest effects favoring the Web, which is not surprising, given that many students who receive a paper survey chose to complete it using the Web option, suggesting a predilection for technology. On the other hand, students who answered paper surveys spent more time preparing for class and did more reading and writing. These findings, combined with previous analysis, especially for items unrelated to computing and information technology, are generally consistent with the results from single institution studies. The full-length report can be downloaded from: [www.nsse.iub.edu/pdf/mode.pdf](http://www.nsse.iub.edu/pdf/mode.pdf).

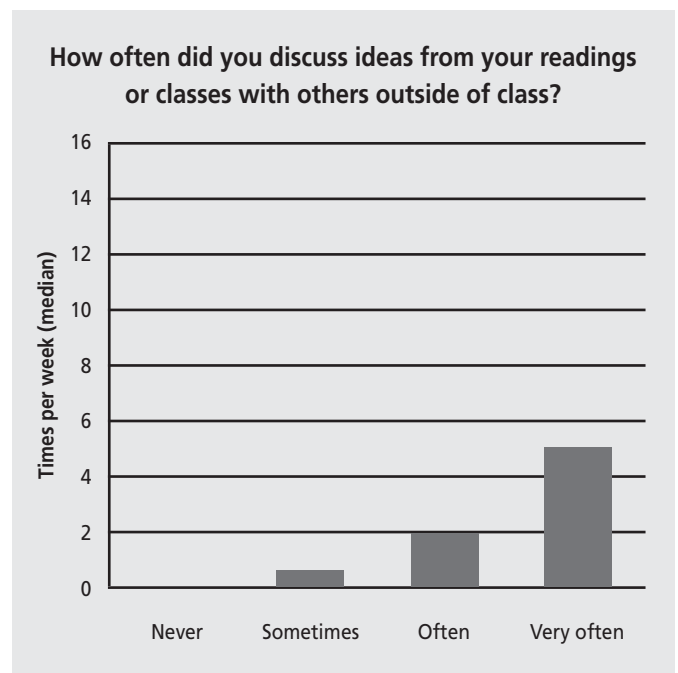
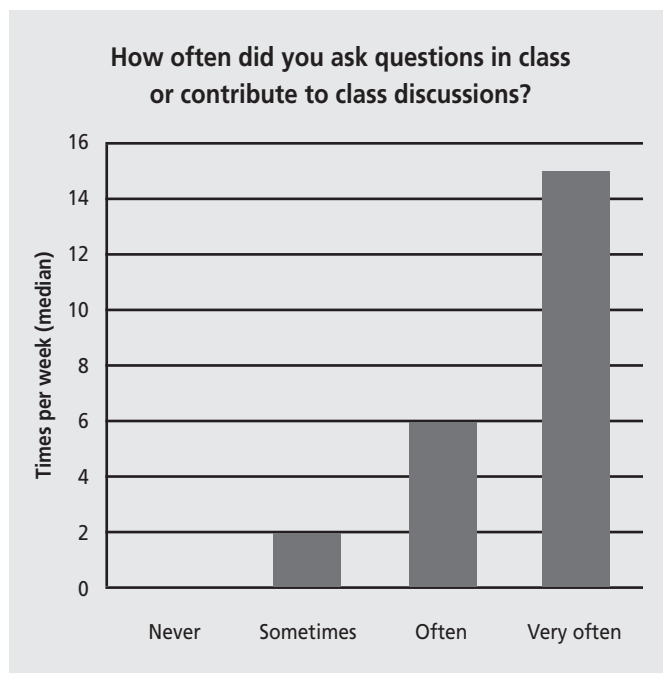
The percentage of students who respond to NSSE using the Web version has increased dramatically over the years. In 2000, less than 40% of the respondents completed the Web version. By 2007, more than 95% of the respondents completed the survey via the Web. Because the vast majority of NSSE respondents use the Web version, the two forms of the survey have even less of an effect on most institution's results.

### How often is often?

Survey researchers often wonder about the meaning of vague quantifiers such as "sometimes" or "often" as employed by the NSSE survey. For example, NSSE asks students to indicate how often they participated in various educational activities by choosing one of four response options: never, sometimes, often, or very often. When we use results from these questions in our assessment efforts and research, we assume that the following questions can all be answered affirmatively:

- Does each response option have a distinct meaning (e.g., Does "often" mean something different than "sometimes")?
- Do the assumed intervals between the options progressively increase in frequency from "never" to "very often?"
- Are the intervals approximately equal (e.g., "very often" means nine times per week, "often" means six times per week, and "sometimes" means three times per week)?
- Do response options change their meaning from item to item (e.g., "often" asking questions in class meant doing so six times per week whereas "often" discussing ideas outside of class mean doing so twice per week)?

In 2006, we conducted a study in which we asked students to quantify their responses to several survey items to which they responded with vague quantifiers earlier on the survey. The results show that across the board students on average assigned distinct and increasing quantities to "never," "sometimes," "often," and "very often." For example, when asked how often they asked questions in class or contributed to class discussions, students said that "never" meant 0 to 1 times per week, "sometimes" meant 2 times per week, "often" meant 6 times per week, and "very often" meant 15 times per week. As this example shows, we found that for most items the intervals between response options are roughly even (see figures below). Additionally, we found that students adapted the meaning of the vague response options from item to item. In the figures below, for example, "very often" means 15 times per week for one item and only 5 times per week for the other.



	<i>Practical Competence</i>		<i>General Education</i>		<i>Personal Social</i>		<i>Grades</i>		<i>Satisfaction</i>	
	FY	SR	FY	SR	FY	SR	FY	SR	FY	SR
<u><i>Level of Academic Challenge</i></u>	.47	.43	.50	.47	.42	.40	.17	.13	.28	.26
<u><i>Active &amp; Collaborative Learning</i></u>	.40	.39	.35	.33	.37	.35	.15	.15	.24	.22
<u><i>Student Faculty Interaction</i></u>	.40	.35	.36	.35	.41	.38	.08	.15	.24	.27
<u><i>Enriching Educational Experiences</i></u>	.33	.27	.30	.29	.36	.34	.11	.13	.21	.21
<u><i>Supportive Campus Environment</i></u>	.56	.55	.52	.51	.56	.57	.11	.12	.56	.58



Note: All correlations are significant at the  $p < .01$  level.

#### How does student engagement relate to self-reported student outcomes?

The NSSE survey includes a number of self-reported student outcome measures such as educational and personal growth, grade point average, and satisfaction. An exploratory factor analysis based on all randomly sampled students who responded to the NSSE 2006 educational and personal growth items in question 11 yielded three factors: personal and social development, practical competence, and general education. NSSE also uses a satisfaction scale comprised of answers to question 12 that asked students to evaluate their entire educational experience and question 13 that asks whether students would attend the same institution again if they could start over. The table above shows the correlations between NSSE Benchmarks of Effective Educational Practice and these self-reported outcomes based upon NSSE 2006 data. More details about student engagement and college outcome can be found at the *Connecting the Dots* report at [www.nsse.iub.edu/pdf/Connecting\\_the\\_Dots\\_Report.pdf](http://www.nsse.iub.edu/pdf/Connecting_the_Dots_Report.pdf).

#### Where can we find additional psychometric information on NSSE?

NSSE has a growing portfolio of psychometric tests and analyses that it conducts on a regular basis. A more comprehensive summary of this work can be found at the NSSE Web site at [www.nsse.iub.edu/html/researchers.cfm](http://www.nsse.iub.edu/html/researchers.cfm).



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