

*Are the students that complete the core NSSE questions and the additional NSSE questions different from those that opt out of the additional NSSE questions?*

### Purpose

In the addition to understanding nonresponse bias that compares characteristics of students who choose to respond to NSSE to those who do not, there is also a need to understand potential bias between students that respond to the core NSSE questions only and those who respond to both the core and additional follow-up questions. Every year, many institutions choose to participate in a consortium, based either on similar types of institutions or thematic questions of interest. For instance, in 2011, 253 of the 673 institutions (38%) that participated in NSSE also chose to participate in a consortium. Furthermore, students at institutions that do not participate in consortia are administered short sets of experimental questions created by NSSE staff, unless the institution declines this option. These experimental item sets can be centered on certain topics relating to student engagement and higher education, or they can be tests of revisions being considered to the core instrument. Because not all students that complete the core NSSE questions go on to complete the additional questions, it is important to consider whether these students are systematically different from those that do complete the additional questions. If there are large systematic differences between those who do and do not complete the additional questions, this indicates that there is a nonresponse effect. This nonresponse effect could potentially introduce error by artificially inflating or deflating results, biasing the results and interpretations. Comparing how core completers only and core and additional completers differ in their demographics and engagement, as well as the magnitude of these differences, addresses this issue.

### Data

These analyses used the 2011 NSSE data set, selecting for the 624 U.S. institutions that either participated in a consortium or allowed experimental items to be administered. These institutions represented a variety of NSSE participants in terms of Carnegie classification, size, institutional control (public vs. private), and geographic region. Only students that completed the core NSSE questions were included in the sample. There were 48,277 students that completed the core but did not complete any additional questions, and there were 301,780 students that completed the core and at least one additional question. The sample was comprised of 43% first-year students and 57% seniors.

## Methods

To investigate whether there were differences in demographic characteristics between those students that completed the core but no additional questions and those that completed the core plus the additional questions, a series of 21 chi-square analyses were conducted. The characteristics of gender, enrollment status, transfer status, Greek status, athlete status, on-campus living status, distance education, traditional age, first generation status, ethnicity, and major field (seniors only). The results of these are summarized in Tables 1 and 2.

A series of independent samples *t*-tests were also conducted. These *t*-tests compared students that completed the core questions only to those that completed the core and the additional questions on the five Benchmarks of Effective Educational Practice, the three Deep Approaches to Learning subscales, and the three Gains subscales. The results of these 22 *t*-tests are summarized in Tables 3 and 4.

## Results

Results indicated that there were significant differences for several of the demographic characteristics. For first-years, female, full-time, non-transfer, non-Greek, non-athlete, on-campus, distance education, and Caucasian students were more likely to complete both the core and additional questions. For seniors, female, full-time, non-transfer, non-Greek, non-athlete, on-campus, non-distance education, traditional age, non-first generation, arts and humanities majors, education majors, social science majors, and Caucasian students were more likely to complete both the core and additional questions. However, when examining the effect sizes, the magnitude of differences was quite small. The phi coefficients for chi-square analyses are all well below .10, the recommended criteria for recognition of a “small” effect (Spatz, 2008). While the results of the chi-square analyses suggest statistically significant differences, this may be primarily due to the large sample size. Further interpretation of the effect size indicates very minimal, if any, practical differences.

An examination of mean student engagement scores also revealed statistically significant differences for several of the Benchmarks, Deep Approaches to Learning, and Gains subscales. For first-years, those that completed both the core and additional questions had significantly higher engagement scores for all Benchmarks, Deep Approaches to Learning, Gains, and Benchmarks (with the exception of Student-Faculty Interaction). For seniors, those that completed both the core and additional questions had significantly higher engagement scores for all Deep Approaches to Learning, Gains, and Benchmarks (with the exception of Supportive Campus Environment). However, when examining the effect sizes, the magnitude of these differences was also quite small. The Cohen’s *d* statistics are all well below .20, the recommended criteria for recognition of a “small” effect (Cohen, 1992). Similar to the results from the chi-square analyses of demographic characteristics, the statistically significant differences in engagement scores may be primarily due to the large sample size, as the effect sizes indicate very minimal practical differences. Overall, these findings suggest that while there are some differences in the characteristics and engagement of students that complete only the core questions compared to those that complete both the core and additional questions, the magnitude of these differences is negligible and is very unlikely to be biasing NSSE results in a substantial way.

## References

Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155-159.

Spatz, C. (2008). *Tales of distributions: Basic statistics* (9<sup>th</sup> ed.). Belmont, CA: Thomson Wadsworth.

**Table 1: First-year Student Results of Chi-Square Analyses for Demographic Characteristics**

	N	$\chi^2$	Sig <sup>a</sup>	Effect size $\phi^b$
Gender	151,843	48.614	***	.018
Enrollment Status	151,852	4.329	*	.005
Transfer Status	150,900	35.933	***	.015
Greek Status	150,595	15.460	***	.010
Athlete Status	150,358	67.305	***	.021
On-campus Living	149,886	32.735	***	.015
Distance Education	150,128	16.365	***	.010
Traditional Age	151,216	2.509		.004
First Generation Status	148,498	2.532		.004
Ethnicity	137,298	299.131	***	.047

<sup>a</sup> \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

<sup>b</sup> phi coefficient for 2x2 chi-square; Cramer's phi for all other chi-squares

**Table 2: Senior Results of Chi-Square Analyses for Demographic Characteristics**

	N	$\chi^2$	Sig <sup>a</sup>	Effect size $\phi^b$
Gender	198,192	156.384	***	.028
Enrollment Status	198,205	196.553	***	.032
Transfer Status	197,096	48.471	***	.016
Greek Status	196,750	12.942	***	.008
Athlete Status	196,462	5.132	*	.005
On-campus Living	195,989	181.508	***	.030
Distance Education	195,481	258.856	***	.036
Traditional Age	196,985	28.349	***	.012
First Generation Status	194,656	13.776	***	.008
Ethnicity	178,100	467.285	***	.051
Major Field	193,963	128.026	***	.026

<sup>a</sup> \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

<sup>b</sup> phi coefficient for 2x2 chi-square; Cramer's phi for all other chi-squares

**Table 3: First-year Student Comparisons for Benchmarks, Deep Approaches to Learning, and Gains**

	<i>Core Only Mean</i>	<i>Core and Extra Mean</i>	<i>Sig<sup>a</sup></i>	<i>Effect size (d)<sup>b</sup></i>
Level of Academic Challenge	53.87	54.79	***	-.07
Active and Collaborative Learning	43.27	43.60	**	-.02
Student-Faculty Interaction	34.85	34.51	*	.02
Enriching Educational Experiences	27.70	28.28	***	-.04
Supportive Campus Environment	63.01	63.96	***	-.05
Higher Order Learning	67.62	69.02	***	-.06
Integrative Learning	54.40	55.20	***	-.04
Reflective Learning	58.48	59.75	***	-.05
Gains in Practical Competence	64.10	64.96	***	-.04
Gains in Personal & Social Development	52.46	52.94	*	-.02
Gains in General Education	68.94	70.73	***	-.08

<sup>a</sup> \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

<sup>b</sup> Cohen's  $d$ ; Mean difference divided by pooled standard deviation

**Table 4: Senior Comparisons for Benchmarks, Deep Approaches to Learning, and Gains**

	<i>Core Only Mean</i>	<i>Core and Extra Mean</i>	<i>Sig<sup>a</sup></i>	<i>Effect size (d)<sup>b</sup></i>
Level of Academic Challenge	57.42	58.27	***	-.06
Active and Collaborative Learning	50.40	52.14	***	-.10
Student-Faculty Interaction	41.97	42.90	***	-.04
Enriching Educational Experiences	39.66	41.88	***	-.12
Supportive Campus Environment	59.92	60.11		-.01
Higher Order Learning	72.65	73.58	***	-.04
Integrative Learning	60.57	61.97	***	-.07
Reflective Learning	60.99	62.42	***	-.06
Gains in Practical Competence	69.16	69.72	***	-.02
Gains in Personal & Social Development	52.75	53.13	*	-.02
Gains in General Education	72.82	73.97	***	-.05

<sup>a</sup> \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$

<sup>b</sup> Cohen's  $d$ ; Mean difference divided by pooled standard deviation