

Do scores on the NSSE survey differ according to group membership in a predictable way?

Purpose

With the known groups validation design (DeVellis, 2003), data is collected from two or more groups that have expected differences on the measure. If the measure is able to discriminate between the groups through statistically significant findings, this provides evidence for the validity of the measure. For student engagement, there are many expected differences based on group membership. Theoretical and empirical research (Pascarella & Terenzini, 2005) suggests that scores should differ by the student-level characteristics of gender, class status, enrollment status, transfer status, Greek membership, athletic participation, campus living, age category, distance education participation, parental education, ethnicity, and major. Furthermore, the NSSE scores should also differ based on the institutional-level characteristics of control (public or private) and Carnegie classification.

Data

In 2009, all randomly sampled students from participating U.S. institutions were included in this analysis. Results of all analyses were weighted by gender, enrollment status, and institution size. Because students need to respond to approximately three-fifths of the items within a benchmark to receive a benchmark score, the number of students used varied by class and benchmark. The numbers of respondents analyzed by class can be seen in Table 1. Some variables were recoded to place respondents into categories. Students that reported living in a dormitory or other campus housing, or a fraternity/sorority house were classified as living on-campus. Students that reported *neither* mother nor father having completed a college degree were classified as first-generation students.

Table 1: Number of Respondents by Class

	First-Year	Senior
Level of Academic Challenge	147,107	167,005
Active and Collaborative Learning	159,883	175,349
Student-Faculty Interaction	148,638	168,248
Enriching Educational Experiences	143,292	163,809
Supportive Campus Environment	139,815	160,907

Methods

To investigate differences between groups, t-tests and ANOVA were conducted using the five NSSE benchmarks. These analyses detect significant differences in the mean scores between two (t-test) or more (ANOVA) groups. Effect size indices, which provide information about the degree of differences between the groups, were also calculated. For t-tests, a *d* value suggests a small (.20 and below), medium (.30 to .70), or large (.80 and above) degree of difference (Cohen, 1992). For ANOVA, the partial eta-squared value provides an estimate of the variation in scores that can be explained by group membership. With very large samples, it is important to distinguish statistical significance, which is more easily detected, from a more practical significance, which is informed by effect size.

Results

Overall, the results of the analyses suggest that the NSSE benchmarks are able to detect differences between groups. There are significant differences in the mean scores of groups based on student-level characteristics of gender, class status, enrollment status, transfer status, Greek membership, athletic participation, campus living, age category, distance education participation, ethnicity, major, and parental education. There are also significant differences in the mean scores of groups based on the institution-level characteristics of control (public or private) and Carnegie classification. Examinations of effect size indicate that there is a small to medium degree of difference between groups and very low explained variance based on group membership. Tabled results of these analyses can be found at the end of this document.

References

- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155-159.
- DeVellis, R.F. (2003). *Scale development: Theory and applications* (2nd ed). Thousand Oaks, CA: Sage Publications.
- Pascarella, E.T., & Terenzini, P.T. (2005). *How college affects students: Volume 2*. San Francisco, CA: Jossey-Bass.

Tables: Student-Level Characteristics

Table 2: 2009 Benchmark Comparisons by Class

	First-Year Mean	Senior Mean	Sig. ¹	Effect Size (d)
Level of Academic Challenge	53.669	57.033	***	-.241
Active and Collaborative Learning	43.167	51.019	***	-.449
Student-Faculty Interaction	34.652	41.971	***	-.364
Enriching Educational Experiences	28.037	40.839	***	-.738
Supportive Campus Environment	61.565	58.240	***	.174

Table 3: 2009 Level of Academic Challenge Comparisons

Group	First-Year			Senior		
	Mean	Sig.	Effect Size (d)	Mean	Sig.	Effect Size (d)
Male	52.6	***	-.14	55.6	***	-.17
Female	54.5			58.1		
Transfer	53.8		-.001	57.0	***	-.01
Non-transfer	53.8			57.2		
Part-time	49.9	***	-.31	53.5	***	-.31
Full-time	54.1			52.1		
Greek affiliated	55.3	***	.12	58.5	***	.11
Non-Greek	53.7			57.0		
Athlete	54.5	***	.05	57.8	***	.05
Non-Athlete	53.8			57.1		
Living on campus	54.3	***	.08	58.0	***	.07
Living off campus	53.2			57.0		
Distance Ed.	55.8	***	.16	59.3	***	.16
Non-distance Ed.	53.7			57.0		
Traditional Age (18-23)	53.8		.01	57.2	**	.02
Non-traditional Age (24+)	53.8			57.0		
First generation	53.4	***	-.04	57.1		.00
Non-first generation	54.0			57.2		

Table 4: 2009 Active & Collaborative Learning Comparisons

Group	First-Year			Senior		
	Mean	Sig.	Effect Size (d)	Mean	Sig.	Effect Size (d)
Male	43.6	***	.05	50.2	***	-.08
Female	42.8			51.7		
Transfer	42.8		-.02	49.9	***	-.11
Non-transfer	43.0			51.8		
Part-time	37.9	***	-.33	45.2	***	-.34
Full-time	43.3			52.1		
Greek affiliated	46.0	***	.20	54.5	***	.23
Non-Greek	42.7			50.5		
Athlete	45.2	***	.14	53.9	***	.18
Non-athlete	42.8			50.8		
Living on campus	43.6	***	.09	52.8	***	.12
Living off campus	42.1			50.7		
Distance Ed.	38.8	***	-.26	43.4	***	-.46
Non-distance Ed.	43.1			51.4		
Traditional Age (18-23)	43.1	***	.07	51.7	***	.11
Non-traditional Age (24+)	42.0			49.8		
First generation	42.6	***	-.03	50.6	***	-.03
Non-first generation	43.2			51.2		

Table 5: 2009 Student-Faculty Interaction Comparisons

Group	First-Year			Senior		
	Mean	Sig.	Effect Size (d)	Mean	Sig.	Effect Size (d)
Male	34.8	**	.02	41.8	***	-.01
Female	34.5			42.1		
Transfer	34.4		.00	39.2	***	-.24
Non-transfer	34.3			44.1		
Part-time	30.8	***	-.21	34.9	***	-.41
Full-time	34.6			43.3		
Greek affiliated	37.9	***	.21	47.0	***	.27
Non-Greek	34.0			41.3		
Athlete	37.4	***	.18	47.3	***	.27
Non-athlete	34.1			41.6		
Living on campus	34.7	***	.06	47.7	***	.32
Living off campus	33.7			41.1		
Distance Ed.	34.0		-.02	35.8	***	-.32
Non-distance Ed.	34.4			42.3		
Traditional Age (18-23)	34.4	***	.06	44.0	***	.26
Non-traditional Age (24+)	33.3			38.6		
First generation	34.7	***	.03	40.3	***	-.12
Non-first generation	34.2			42.8		

Table 6: 2009 Enriching Educational Experiences Comparisons

Group	First-Year			Senior		
	Mean	Sig.	Effect Size (d)	Mean	Sig.	Effect Size (d)
Male	27.7	***	-.04	39.7	***	-.11
Female	28.3			41.7		
Transfer	28.2	***	-.07	36.1	***	-.49
Non-transfer	27.3			44.9		
Part-time	23.1	***	-.39	32.7	***	-.55
Full-time	28.4			42.6		
Greek affiliated	34.1	***	.50	49.1	***	.51
Non-Greek	27.5			39.9		
Athlete	31.5	***	.28	49.3	***	.49
Non-athlete	27.8			40.5		
Living on campus	29.5	***	.26	48.8	***	.50
Living off campus	26.0			39.8		
Distance Ed.	26.9	***	-.10	33.7	***	-.43
Non-distance Ed.	28.2			41.5		
Traditional Age (18-23)	28.4	***	.31	44.8	***	.56
Non-traditional Age (24+)	24.2			34.6		
First generation	26.6	***	-.16	37.6	***	-.28
Non-first generation	28.8			42.6		

Table 7: 2009 Supportive Campus Environment Comparisons

Group	First-Year			Senior		
	Mean	Sig.	Effect Size (d)	Mean	Sig.	Effect Size (d)
Male	61.1	***	-.05	57.5	***	-.06
Female	62.0			58.8		
Transfer	58.7	***	-.18	57.3	***	-.10
Non-transfer	61.9			59.1		
Part-time	57.8	***	-.22	56.1	***	-.14
Full-time	61.9			58.7		
Greek affiliated	64.3	***	.16	61.4	***	.18
Non-Greek	61.3			57.9		
Athlete	64.6	***	.18	63.1	***	.26
Non-athlete	61.3			58.0		
Living on campus	62.9	***	.17	61.5	***	.19
Living off campus	59.7			57.8		
Distance Ed.	61.4		-.02	60.5	***	.12
Non-distance Ed.	61.7			58.2		
Traditional Age (18-23)	61.7	***	.09	58.9	***	.08
Non-traditional Age (24+)	60.1			57.3		
First generation	61.5		-.01	58.8	***	.04
Non-first generation	61.7			58.0		

Table 8: 2009 Ethnicity Benchmark ANOVA Comparisons

Group	First-Year			Senior		
	F	Sig.	Partial Eta ²	F	Sig.	Partial Eta ²
Level of Academic Challenge	35.0	***	.002	49.8	***	.003
Active & Collaborative Learning	77.9	***	.005	70.3	***	.004
Student-Faculty Interaction	116.6	***	.007	23.7	***	.001
Enriching Educational Experiences	48.3	***	.003	32.4	***	.002
Supportive Campus Environment	112.6	***	.007	220.5	***	.012

*Response Options: American Indian or other Native American; Asian, Asian American, or Pacific Islander; Black or African American, White (non-Hispanic); Mexican or Mexican American; Puerto Rican; Other Hispanic or Latino; Multiracial; Other; I prefer not to respond

Table 8: 2009 Major Benchmark ANOVA Comparisons

Group	First-Year			Senior		
	F	Sig.	Partial Eta ²	F	Sig.	Partial Eta ²
Level of Academic Challenge	126.1	***	.008	241.5	***	.013
Active & Collaborative Learning	98.6	***	.007	465.8	***	.025
Student-Faculty Interaction	93.3	***	.006	291.1	***	.016
Enriching Educational Experiences	153.7	***	.010	234.1	***	.013
Supportive Campus Environment	23.2	***	.002	78.4	***	.004

*Recoded Major Categories: Arts and Humanities; Biological Sciences; Business; Education, Engineering; Physical Science; Professional; Social Science; Other; Undecided

Tables: Institution-Level Characteristics

Table 9: 2009 Benchmark Comparisons by Institutional Control

	Control	First-Year			Senior		
		Mean	Sig.	Effect Size (d)	Mean	Sig.	Effect Size (d)
Level of Academic Challenge	Public	52.6	***	-.25	56.2	***	-.22
	Private	56.0			59.3		
Active & Collaborative Learning	Public	42.1	***	-.21	50.2	***	-.17
	Private	45.6			53.2		
Student-Faculty Interaction	Public	33.8	***	-.15	40.8	***	-.21
	Private	36.6			45.2		
Enriching Educational Experiences	Public	27.4	***	-.16	39.3	***	-.32
	Private	29.6			45.0		
Supportive Campus Environment	Public	60.1	***	-.26	56.8	***	-.27
	Private	65.0			62.0		

Table 10: 2009 Carnegie Classification Benchmark ANOVA Comparisons

Group	<i>First-Year</i>			<i>Senior</i>		
	<i>F</i>	<i>Sig.</i>	<i>Partial Eta²</i>	<i>F</i>	<i>Sig.</i>	<i>Partial Eta²</i>
Level of Academic Challenge	103.5	***	.005	85.0	***	.004
Active & Collaborative Learning	105.4	***	.005	192.9	***	.008
Student-Faculty Interaction	141.0	***	.007	243.8	***	.011
Enriching Educational Experiences	187.3	***	.010	455.1	***	.020
Supportive Campus Environment	101.8	***	.006	251.7	***	.012

*Carnegie Classification Categories: Doctoral Research Universities (very high research activity); Doctoral Research Universities (high research activity); Doctoral/Research Universities; Master's Colleges and Universities (larger programs); Master's Colleges and Universities (medium programs); Master's Colleges and Universities (smaller programs); Baccalaureate Colleges-Arts & Sciences; Baccalaureate Colleges-Diverse Fields; Other

¹ ***p<.001 **p<.01 *p<.05