

# **Nuggets from NSSE: Evidence for the Assurance of Learning**

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# **NUGGETS FROM NSSE: EVIDENCE FOR THE ASSURANCE OF LEARNING**

## **ABSTRACT:**

Collecting evidence of the achievement of learning outcomes can be like panning for gold. Valuable nuggets were found in this institution's analysis of its students' responses to the National Survey of Student Engagement. Respondents cited their university experience as especially powerful in nine fundamental learning outcomes, two-thirds of which exhibited significant gains from the first to the senior year. The educational return on the institution's substantial investments in computer technology was affirmed. Significant gains in higher-order critical thinking skills were also found. Lessons learned will be shared about panning for NSSE nuggets on learning outcomes.

## **RESEARCH PROBLEM:**

Over the last decade, regional and program accreditors have stepped up their expectations for the presentation of evidence that student learning outcomes are being achieved. The three basic questions that guide assessments of learning outcomes are: What do our graduates know? What can they do? What are they like? Answers to those questions have been challenging to document in colleges and universities. Finding evidence for the assurance of learning at the first-year level and by the completion of the degree program is challenging and can be like panning for gold.

As one of 473 colleges and universities that participated in the National Survey of Student Engagement (NSSE) in 2004, we received an extensive summary of survey responses from random samples of our institution's first-year and senior students. A means analysis with national comparator groups was also provided for all items on the NSSE instrument. NSSE factor scores were not included in this initial data set. As we explored options for interpreting the institutional report, a key question arose as to whether there was any evidence supporting the assurance of learning. "Assurance of Learning" is the term our institution has adopted to describe the assessment of student learning outcomes.

## **RESEARCH METHODS:**

The answer to that key research question was not obvious or readily available because NSSE does not focus strongly on the assessment of learning outcomes. It focuses instead on the nature and extent of student engagement with the collegiate experience. However, a critical review of the content of the survey's items revealed a couple of key sections of the instrument that contained questions which could and did shed some light on the university's achievement of its learning outcomes.

Although they were not specifically identified by NSSE as "learning outcomes," the 16 items under "Educational & Personal Growth" in question number 11 focused on the impact of the university experience on the student's knowledge, skills, and personal development (i.e., the three domains of learning outcomes assessment). Many of these learning outcomes are fundamental and central to the mission of undergraduate education. Not only were the levels of institutional impact on these outcomes examined separately for the institution's first-year and senior students, but gains in the number reporting great impact between the first and senior years were also analyzed. Comparative analyses with national samples were performed.

Similar analyses of the five items under "Mental Activities" in question number 2 were performed. These appeared to correspond to Bloom's taxonomy (1956) of higher-order and lower-order thinking, and offered evidence of institutional contributions to critical thinking skills.

The power of this analysis was raised substantially by collapsing NSSE's four-point response scales to two and shifting from a statistical reliance on means analysis to simpler descriptive statistics and nonparametric tests of significance (Chi-Square). As a result, interpretation and usefulness of the results were more readily understood by campus constituents.

## **RESEARCH RESULTS:**

A number of notable nuggets from NSSE were found. Chief among those was the finding that the majority of first-year and senior respondents credited their experience at the institution greatly for facilitating their development in nine fundamental learning outcomes, including: "acquiring a broad general education," "thinking critically and analytically," "using computing and information technology," "writing clearly and effectively," "working effectively with others," "learning effectively on your own," "analyzing quantitative problems," "speaking clearly and effectively," and "acquiring job or work-related education." Furthermore, statistically significant and often substantial gains in reported achievement were found for six of these nine core learning outcomes. Although those nine items reflected knowledge and skill outcomes primarily, notable impacts in the attitudinal or dispositional domain were also found for the items: "understanding yourself," "understanding people of other races," and "developing personal values and ethics." Outcomes for which the institution had the lowest reported impact included: "contributing to your community," "voting in local, state, and national elections," and "developing deepened spirituality." All of these findings had face validity in that they were consistent with the curricular intentions and emphasis of the institution's faculty and undergraduate programs. The researcher speculates that some of the differences noted with national comparators on these outcomes could have been affected by the confounding influence of significantly higher nontraditional student representation in the institution's samples.

Significantly larger proportions of the institution's first-year and senior respondents reported great institutional impact on the development of the students' use of computing and information technology than in the national comparator groups. This finding was particularly affirming for the effectiveness of the institution's substantial efforts and investments over the last five years in improving its technology resources for students, faculty, and instructional enhancement.

Another nugget which was consistent with the faculty's intent in undergraduate education involved the respondents' reports of institutional impact on their development of critical thinking skills. The most widespread developmental impact was reported for "analyzing" followed by "synthesizing." The proportions of students who reported great institutional contributions to their development of these higher-order thinking skills grew significantly from the first to the senior year. Of the five thinking skills, the institution had the least (but nevertheless a substantial) impact on developing the students' "memorizing" skills. Differences between analyzing and memorizing were statistically significant for seniors, but not for first-year students.

## **LESSONS LEARNED:**

There is gold in the mountains of summary data produced from NSSE. The nuggets from NSSE that may be especially valuable are those that provide evidence in support of our students' achievement of the institution's expected learning outcomes. However, panning for those nuggets required special efforts to screen the survey data differently from the standard methods used by NSSE. Simpler statistical analysis can produce richer results. Greater focus within the institution between first-year and senior students than between the institution and its comparator groups can yield important evidence of value-added educational impact. Most importantly, focusing on the parts of NSSE where the fundamental learning outcomes of an undergraduate education are assessed can provide powerful evidence for the assurance of learning, especially if the students' self-reported learning can be corroborated by other sources of evidence.

## **BIBLIOGRAPHY**

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## Nuggets from NSSE: Evidence for the Assurance of Learning ( 216 )

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## Evidence of Student Learning: The Gold Standard for Accreditation

- Institutional and program accreditors have stepped up demands for **evidence that student learning outcomes are being achieved and improved.**
- Finding such evidence is often like **panning for gold.**

## NSSE Produces Mountains of Summary Data and Analyses

- Lengthy survey instruments and many potential comparators and comparisons
- The Institutional Report's three-inch binder
- An overwhelming array of data and comparative summaries

## Panning for Nuggets from NSSE

If **evidence of student learning is what you're looking for**, most of the mountain is not gold, but there is gold in "them thar hills" !



## No Maps or Directions for Gold Mining and Prospecting



❖ You're on your own in the search for gold

❖ You're welcome to work our claim—there's bound to be more gold where ours came from!

## How Do We Know It's Gold?

It's Gold--a Student Learning Outcome--if it is:

- 1) **What Students Know (Knowledge)**  
or
- 2) **What Students Can Do (Skills)**  
or
- 3) **What Student's Are Like (Dispositions)**

## Golden Items in NSSE

NSSE #11(a-p)  
“Educational & Personal Growth”

**“To what extent has your experience at this institution contributed to your knowledge, skills, and personal development in the following areas?....”**



## Large Nuggets: Nine Fundamentals at KSU—Handout #1

- 11 a **Broad General Education**
- 11 e **Thinking Critically & Analytically**
- 11 g **Using Information Technology**
- 11 c **Writing Clearly & Effectively**
- 11 h **Working Effectively with Others**
- 11 j **Learning Effectively on Your Own**
- 11 f **Analyzing Quantitative Problems**
- 11 d **Speaking Effectively & Clearly**
- 11 b **Acquiring Work-Related Knowledge/Skills**



## Small Nuggets at KSU (Handout #1)

- 11 k Understanding yourself
- 11 m Solving complex real-world problems
- 11 l Understanding people of other racial and ethnic backgrounds
- 11 n Developing a personal code of values and ethics



## Gold Dust at KSU (Handout #1)

- 11 o Contributing to your community
- 11 i Voting in local, state, or national elections
- 11 p Developing a deepened sense of spirituality



## More Golden Items—Handout #2

NSSE # 2 (a-e) “Mental Activities”  
Bloom’s **Lower-Order/Higher-Order Learning**

- a) Memorizing
- b) Analyzing**
- c) Synthesizing**
- d) Making Judgments
- e) Applying



## Some Mines Produce More Gold Handout #3



❖ **Assurance of Learning in IT: Significantly More Students Reported Great KSU Impact on Computer and IT Skills**



NUGGETS FROM NSSE

Not  
Fools  
Gold



The  
Real  
Thing

For Copies and More Info:  
[www.kennesaw.edu/ie](http://www.kennesaw.edu/ie)



## Nuggets from NSSE: Fundamental Learning Outcomes

## Handout #1

The KSU experience was frequently rated as having had a strong impact on developing nine fundamental learning outcomes in undergraduate education. Nine out of every 10 respondents in the 2004 NSSE reported that their KSU experience contributed greatly (i.e., “Quite a Bit” or “Very Much”) to their acquisition of a broad general education. Typically, three-fourths or more of the respondents credited the KSU experience greatly for their development of knowledge and skills in critical thinking, writing, speaking, quantitative analysis, computer usage, working with others, independent learning, and job-related career preparation. Of the 16 undergraduate learning outcomes that were rated, these nine are arguably the most fundamental and important for a sound educational experience at a comprehensive public university like KSU. (See the top nine listings in Table 1.)

**Table 1**

### Percent of Students Crediting the KSU Experience Greatly for Their Growth in 16 Undergraduate Learning Outcomes and the Significance of Gains from the First Year to the Senior Year

Contribution of the KSU Experience to a Specific Learning Outcome	% Rating the Contribution as Great		
	1st-Yr	Senior	Difference*
<b>Nine Fundamentals</b>			
Acquiring a broad general education	85%	87%	Not Significant
Thinking critically and analytically	77%	88%	Significant
Using computing and information technology	76%	81%	Not Significant
Writing clearly and effectively	72%	84%	Significant
Working effectively with others	71%	83%	Significant
Learning effectively on your own	67%	72%	Not Significant
Analyzing quantitative problems	59%	75%	Significant
Speaking clearly and effectively	58%	78%	Significant
Acquiring job or work-related education	50%	74%	Significant
<b>Four Additional Notables</b>			
Understanding yourself	52%	56%	Not Significant
Solving complex real-world problems	47%	59%	Not Significant
Understanding people of other races	46%	50%	Not Significant
Developing personal values and ethics	40%	45%	Not Significant
<b>Weakest Outcomes</b>			
Contributing to your community	28%	31%	Not Significant
Voting in local, state, national elections	28%	20%	Not Significant
Developing deepened spirituality	18%	9%	Not Significant

\* Significance of differences were tested using Chi Square at  $p < .05$ , d.f. = 1.

The percentages of seniors who gave great credit to the KSU experience were higher for all nine learning outcomes than the comparable percentages of first-year students. In six of those nine comparisons, the gains from the first year to the senior year were statistically significant and large enough to be meaningful as well. It is affirming to see this evidence that the percentages of students who experienced great educational and personal development at KSU were so high and grew significantly in critical thinking skills, writing skills, teamwork, quantitative skills, speaking skills, and career-related education from the freshman to the senior years, reflecting a value-added impact of both the general education program as well as study in the major field.

## Nuggets from NSSE: Critical Thinking Skills

## Handout #2

No notable differences existed between KSU students and NSSE's national samples in their reports of coursework emphasis on critical thinking and higher-order learning skills. However, there were several important findings between lower-order and higher-order thinking skills within KSU between freshmen and seniors.

For example, both first-year and senior students reported the least emphasis in their coursework on the lower-order thinking skills of memorizing facts and ideas and the most emphasis on the higher-order thinking skills of analyzing ideas and experiences. This difference was significant and notable for seniors. That finding corresponds to the ideals of the educational philosophy in higher education in which critical thinking, especially analyzing and synthesizing information, is valued more than rote memorization and grows in emphasis throughout the undergraduate experience.

Significantly more KSU seniors also reported great emphasis (i.e., "Quite a Bit" or "Very Much") on analyzing and synthesizing activity in their coursework than freshmen reported for their first-year experience. That finding is consistent with expectations that upper division coursework would entail greater higher-order thinking skills than lower division coursework as students advance in their collegiate studies. (See Table 3.)

Several related NSSE items that focused on student engagement in synthesizing intellectual activity yielded convergent findings of support. For example, KSU freshmen and seniors reported working significantly more often than their national counterparts on a paper or project that required integration of ideas or information from various sources (item 1d). Significantly more reported putting together ideas or concepts from different courses when completing assignments or during class discussions (item 1i). This building block effect of drawing on other courses increased significantly and very substantially from the freshman to the senior year for KSU students (52% of first-year students often did so compared to 75% of seniors).

**Table 2**

### **KSU Coursework Emphasis on Critical Thinking**

<b>Critical Thinking Dimension Emphasized in Coursework</b>	<b>% Reporting a Great Emphasis</b>		
	<b>1st-Yr</b>	<b>Senior</b>	<b>Difference*</b>
Analyzing	73%	88%	Significant
Synthesizing	63%	78%	Significant
Applying	74%	82%	Not Significant
Making Judgments	68%	76%	Not Significant
Memorizing	63%	69%	Not Significant
Difference Between Analyzing and Memorizing	Not Significant	Significant	

Significance of differences were tested with Chi Square  $p < .05$ , d.f. = 1

## Nuggets from NSSE & FSSE: Exceptional Impact on Computing Handout #3

KSU's results from the NSSE on most of the 16 student learning outcomes are not significantly different from the results of comparator groups at the national level. The few exceptions involved a small effect size and are not especially notable. Basically, KSU first-year and senior students reported achievements in learning that were solidly in the national mainstream with those reported by the entire national sample of NSSE respondents and by the national sample from Master's I & II Carnegie classifications.

One notable exception involved information technology. KSU's significantly greater impact on the development of computing and information technology skills for freshmen and seniors affirms the value of the institution's extensive investments for improving instructional and information technology under a CIO over the past five years (see Table 5). This significant distinction for KSU on a key fundamental learning outcome was reinforced by results from three additional NSSE items related to technology (items 1l, 1m, and 10g). Nine out of every 10 freshmen and seniors reported that KSU places great emphasis on the use of computers in academic work. Significantly more KSU students reported this strong emphasis than their counterparts at other Masters I & II institutions, although the difference was rather modest (90% of KSU freshmen compared to 83% elsewhere and 92% of KSU seniors compared to 87% elsewhere). In addition, significantly more KSU seniors reported using an electronic medium frequently to complete assignments than students in the national comparator groups (81% of KSU seniors often did so compared to 59% of both national samples). KSU seniors also reported using email to communicate with their instructors significantly more often (87% of KSU seniors often did compared to 76% and 79% of the two national samples respectively). The significantly large gains made by KSU students from their freshmen to senior years in using technology to complete assignments (58% of KSU freshmen often did so compared to 81% of KSU seniors) and to communicate with their professors (63% of freshmen compared to 87% of seniors) were especially noteworthy of value-added learning. The convergence of these findings underscores exceptional strength in the use of computing and information technology in KSU's educational experience.

Rarely did nearly all faculty members and nearly all students share similar opinions about any of the same items in the FSSE and NSSE. They did so, however, in regard to their belief that KSU strongly encourages students to use computers in their academic work. Nearly all faculty and student respondents, more than nine out of every 10, affirmed the institution's strong commitment to and advancements in the use of technology in KSU's educational experience.

**Table 3**

### Great Use of Computing & Information Technology as a Learning Outcome (11 g)

Student Level	% Reporting Great Use			Differences*
	KSU	Master's	NSSE	
First-Year	76%	65%	65%	Significant
Seniors	81%	76%	77%	Significant

\*Significance of differences between KSU and comparators were tested using Chi Square at  $p < .05$ , d.f. = 1.