

RUNNING HEAD: SERVICE LEARNING AND DEEP LEARNING

The Relationship between Service Learning and Deep Learning

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**Abstract**

This research investigated the relationship between college students' participation in service learning courses and their reported use of deep learning skills. An analysis of 2012 National Survey of Student Engagement data for freshmen and seniors at Indiana University-Purdue University, Indianapolis found that reported deep learning skills of higher order learning, integrative learning, and reflective learning were all higher for both freshmen and seniors who participated in service learning courses, with integrative learning skills having the greatest gain. These results contribute evidence that service learning should be valued to the extent that it contributes to student learning at the course level as well as at the institutional level and provide a rationale for institutions to support faculty who engage with the community partners to develop service learning courses.

## **Introduction and Literature Review**

### *Service Learning*

With the growing focus on the public purposes of higher education, the presence of service learning courses on college campuses has increased substantially over the past two decades and increasingly been recognized as a pedagogy that results in several positive outcomes for students. Service learning is defined as a "course-based, credit bearing educational experience in which students (a) participate in an organized service activity that meets identified community needs, and (b) reflect on the service activity in such a way as to gain further understanding of course content, a broader appreciation of the discipline, and an enhanced sense of personal values and civic responsibility" (Bringle & Hatcher, 2009, p. 38).

Participation in service learning courses has been shown to have significant positive effects on several outcome measures, including 1) academic performance - GPA, writing skills, critical thinking skills; 2) values - commitment to activism and to promoting racial understanding; 3) self-efficacy; 4) leadership - leadership activities, self-rated leadership ability, interpersonal skills; 5) ) choice of service career; and 6) plans to participate in service after college (Astin, Vogelgesang, Ikeda, & Yee, 2000).

Students participating in service learning courses interact more often with faculty. Often, this interaction takes place in out-of-classroom settings (Sax & Astin, 1997). Research also indicates a greater level of satisfaction with participation in service

learning courses compared with courses without the service component (Gray, Ondaatje, Fricker, & Geschwind, 2000). Service learning courses have also been found to enhance academic outcomes, attitudes, and values related to civic engagement and personal growth (Eyler, Giles, Stenson, & Gray, 2001). Novak, Markey, and Allen's (2007) meta-analysis of nine research studies reported an effect size favoring service-learning that translated into over a 50% advantage on cognitive outcomes for students in service learning courses.

### *Deep Learning*

Deep learning, as compared to surface learning, describes the extent to which a student engages in the learning process. A surface learner attempts to gather disparate information that might be useful to complete a particular assignment. The material is often forgotten after completion of the task. This approach is a considerably more restrictive strategy for learning than deep learning. Deep learning involves reflection on the material and can transform the manner in which one thinks and interprets new information (McDrury & Alterio, 2002).

Students who use deep learning strategies make more robust connections to course material by emphasizing learning activities such as integration, synthesis, and reflection (National Survey of Student Engagement, 2012). By making deeper connections, students focus on both the substance and the underlying meaning of their studies. Students learn to apply the knowledge gained to real life situations and successfully integrate this with prior learning. Additionally, "deep approaches to learning

have been associated with numerous positive outcomes including higher grades, and the ability to retain, integrate and transfer information at higher rates, not to mention greater satisfaction with the learning experience” (Laird, Shoup, & Kuh, 2006). In short, students become more engaged and as a result are willing to delve more deeply into the learning process.

Research at the National Survey of Student Engagement (NSSE) identified three constructs that comprise deep learning. Cognitive interviews were conducted to ensure that students were interpreting the survey questions as the researchers intended. Through extensive validation studies, the psychometric properties of the survey items were found to be acceptable. Exploratory and confirmatory factor analyses suggested that the survey “contains a reliable measure of students’ uses of deep approaches to learning with three subscales: higher-order learning, integrative learning, and reflective learning” (Laird, Shoup, & Kuh, 2006).

**Higher-Order Learning** – How much courses emphasize advanced thinking skills as applying theories to practical problems or synthesizing information into new interpretations

**Integrative Learning** – Integrating ideas from various sources, including diverse perspectives in coursework, and discussing ideas outside of class

**Reflective Learning** – Examining one’s own thinking and the perspectives of others (National Survey of Student Engagement, 2012)

### **Theoretical Framework**

Moon's (1999) theory on the map of learning provides a theoretical basis to understand how deep learning skills can be developed through participation in service learning courses. Moon posits that there are five steps that explain how learning occurs. These steps are noticing, making sense, making meaning, working with meaning, and transformative or deep learning. While participating in service learning courses, students are engaged in active learning that is often unpredictable and complex within the community setting. They are challenged to link this experience with course readings and to critically think about both the text and the service experience. By its very nature, service learning can be expected to contribute to gains in deep learning.

### **Deep Learning Survey Questions**

The deep learning questions developed by NSSE have the following possible responses: *Very Often, Often, Sometimes, Never*.

#### Higher-Order Learning (4 items)

*During the current school year, how much has your coursework emphasized the following mental activities?*

- Applying theories or concepts to practical problems or in new situations
- Analyzing the basic elements of an idea, experience, or theory, such as examining a particular case or situation in depth and considering its components

- Making judgments about the value of information, arguments, or methods, such as examining how others gathered and interpreted data and assessing the soundness of their conclusions
- Synthesizing and organizing ideas, information, or experiences into new, more complex interpretations and relationships

#### Integrative Learning (5 items)

*In your experience at your institution during the current school year, about how often have you done each of the following?*

- Worked on a paper or project that required integrating ideas or information from various sources
- Included diverse perspectives (different races, religions, genders, political beliefs, etc.) in class discussions or writing assignments
- Put together ideas or concepts from different courses when completing assignments or during class discussions
- Discussed ideas from your readings or classes with faculty members outside of class
- Discussed ideas from your readings or classes with others outside of class (students, faculty members, co-workers, etc.)

#### Reflective Learning (3 items)

*During the current school year, about how often have you done each of the following?*

- Examined the strengths and weaknesses of your own views on a topic or issue
- Tried to better understand someone else's views by imagining how an issue looks from his or her perspective
- Learned something that changed the way you understand an issue or concept

### **Methods**

The IUPUI Office of Information Management and Institutional Research administered the NSSE survey to freshmen ( $n = 524$ ) and seniors ( $n = 998$ ) from February 2012 through the end of the semester and provided the data to CSL in July of the following year. The independent variable, participation in service learning courses, was derived from NSSE survey question 1k:

*In your experience at your institution during the current school year, about how often have you done each of the following?*

k. Participated in a community-based project (e.g., service learning) as part of a regular course

This independent variable was subsequently recoded from the four item Likert scale (very often, often, sometimes, never) used on NSSE to a dichotomous variable (have or have not participated in service learning courses). As Table 1 illustrates, both



freshmen and senior students at IUPUI reported a greater level of engagement in service learning courses than other Urban 13 schools, public research institutions, and the NSSE sample (National Survey of Student Engagement, 2012, p. 20).

(Insert Table 1 here)

The dependent variable deep learning was comprised of three different scales. Reliability analysis was conducted for higher-order learning ( $\alpha=.83$ ), integrative learning ( $\alpha=.73$ ), and reflective learning ( $\alpha=.83$ ). The data file was then split into freshman and senior students so the analysis could be conducted on these two populations separately. An independent-samples t-test evaluated differences in reported deep learning skills between students who participated in one or more service learning courses and those students who did not participate in service learning courses. Deep learning skills of higher-order learning, integrative learning, and reflective learning were all higher for both seniors and freshman who participated in service learning course(s).

While the independent samples t-test found a significant difference between those who participated in a service learning course and those who did not, it does not indicate the extent of the difference. To overcome this limitation, the effect size was calculated and reported in Tables 2 and 3

(Insert Table 2 here)

(Insert Table 3 here)

### **Implications**

The shift from teaching to learning in higher education has shaped the development of many active learning strategies, including service learning, that place more emphasis on a learner centered approach (Tagg, 2003). Deep learning is more likely to occur when students are engaged in a personal way with their learning. Marchese (1997) posits as keys to deep learning: (a) active learning strategies; (b) frequent feedback from others that is provided in non-threatening ways; (c) collaboration; (d) cognitive apprenticeship (i.e., relationship with a mentor with whom students can learn generalization of principles, transfer of knowledge between theory and practice, and analysis of perplexing circumstances); and (e) practical applications in which students are involved in tasks that have consequences but with a safety net for high stakes mistakes. Service learning has many of these qualities.

Service learning should be valued to the extent that it contributes to student learning at the course level as well as at the institutional level. These results contribute evidence of student learning at the institution level. These findings are consistent with prior research on participation in service learning and improved student outcome measures (Astin et. al., 2000) and provide a rationale for institutions to support faculty who engage with the community partners to develop service learning courses. For faculty who teach service learning courses, these findings support the value, from an institutional perspective, of the work that they do.

This research indicates that in comparing students who participated in service learning with those who had not the mean differences between the groups, for both

freshmen and seniors, was greatest for integrative learning. According to Price, “service learning promotes transformative, embodied learning...and not only embeds learners in open-ended, unscripted environments but it provides the necessary scaffolding to enable students to increase their capacity for attending to one or more elements of integrative learning” (Price, 2013, p. 1).

Structured reflection is recognized to be a crucial component of good practice in service learning. The inclusion by NSSE of reflective learning as one of the three constructs of deep learning further reinforces the importance of this aspect of a service learning course. Instructors should therefore design reflection activities that incorporate both higher-order learning and integrative learning skills. Whether through structured prompts, digital storytelling, or products within an ePortfolio, it is valuable for reflection activities to be creative, innovative, and build upon prior learning experiences.

### **Limitations of the Findings**

This research was based on a sample of undergraduates from one campus in the Midwest. Self-selection into service learning courses is a potential confounding variable on these results since students may have been aware of the presence or absence of the service learning component when they were selecting courses. Because there was no random assignment, these results - the association between service learning and deep learning - are correlational. No causality can be inferred.

Additionally, the self-report nature of the NSSE data and the potential for students' definition of service learning to differ from the researcher's definition are both possible short comings of the findings. As mentioned previously, however, NSSE researchers conducted extensive cognitive interviews with students to ensure that they were interpreting the survey questions as the researchers intended.

### **Future Research**

Future research should explore these findings across institutional and regional types. Further analysis of NSSE data is also warranted to understand the association of service learning dosage and deep learning, as well as how participation in service learning courses correlates with other engagement variables such as collaborative learning, student-faculty interaction, and quality of interactions.

### References

- Astin, A. W., Vogelgesand, L., Ikeda, E., & Yee, J., (2000). *How service-learning affects students*. Los Angeles, CA: Higher Education Research Institute, UCLA.
- Bringle, R. G. & Hatcher, J. A. (2009). Innovative practices in service-learning and curricular engagement. In Sandmann, L. R., Thornton, C. H., & Jaeger, A. J. (Eds.), *Institutionalizing community engagement in higher education: The first wave of Carnegie classified institutions. New Directions for Higher Education* (pp. 37-46). San Francisco: Jossey-Bass/Wiley Publishing.
- Eyler, J., Giles, D. E., Jr., Stenson, C. M., & Gray, C. J. (2001). *At a glance: What we know about the effects of service-learning on college students, faculty, institutions and communities, 1993-2000* (3<sup>rd</sup> ed.). Nashville, TN: Vanderbilt University.
- Gray, M. J., Ondaatje, E. H., Fricker, R. D., & Geschwind, S. A. (2000). Assessing service-learning: Results from a survey of “Learn and Serve America, Higher Education.” *Change*, 32, 30-39.
- Laird, T. F., Shoup, R., & Kuh, G. D. (2006, May). *Measuring deep approaches to learning using the national survey of student engagement*. Presentation at the annual meeting of the Association for Institutional Research, Chicago, IL.
- Marchese, T. J. (1997). The New Conversations about Learning: Insights from Neuroscience and Anthropology, Cognitive Studies and Work-Place Studies. In E. Chaffee, P. Ewell, S. Gelman, G. Kuh, T. Marchese, M. Miller, & G. Wiggins

- (Eds.) *Assessing Impact: Evidence and Action* (pp. 79–95). Washington: American Association for Higher Education.
- McDrury, J., & Alterio, M. (2004). *Learning through story telling in higher education. Using reflection and experience to improve learning*. Sterling, VA: Dunmore Press.
- Moon, J. (1999). *Reflection in learning and professional development*. London: Kogan Page Limited.
- National Survey of Student Engagement. (2012). *Annual Report*. Retrieved July 31, 2013, from  
[http://nsse.iub.edu/NSSE\\_2012\\_Results/pdf/NSSE\\_2012\\_Annual\\_Results.pdf](http://nsse.iub.edu/NSSE_2012_Results/pdf/NSSE_2012_Annual_Results.pdf).
- National Survey of Student Engagement. (2012). *Technical Report*. Retrieved August 23, 2013, from  
[http://imir.iupui.edu/surveys/reports/default.aspx/STU/STU\\_NSSE/71/3/2012](http://imir.iupui.edu/surveys/reports/default.aspx/STU/STU_NSSE/71/3/2012).
- Novak, J. M., Markey, V., & Allen, M. (2007). Evaluating Cognitive Outcomes of Service Learning in Higher Education: A Meta-Analysis. *Communication Research Reports* 24:149–57.
- Price, M. (2013). Integrative learning in the context of service learning. Handout developed for the 2013 William M. Plater Symposium, Indianapolis, IN.

Sax, L. J., & Astin, A. W. (1997). The benefits of service: Evidence from undergraduates.

*Educational Record*, 78(3-4), 25-32.

Tagg, J. (2003). *The learning paradigm college*. Boston: Anker.

## Tables

**Table 1: Participation in Service Learning**

	IUPUI	Urban 13	Public Research	NSSE Sample
<b>Freshmen</b>	<b>56%</b>	<b>38%</b>	<b>38%</b>	<b>41%</b>
<b>Seniors</b>	<b>58%</b>	<b>40%</b>	<b>43%</b>	<b>48%</b>

Percentages are weighted by gender and enroll. status (and inst. size for comparison)

**Table 2: IUPUI Freshmen**

Construct	# of Items	Mean (Overall) N=524	Mean (Service Learning) N=305, 58%	Mean (No Service Learning) N=219, 42%	Mean Difference (SL and No SL)	Reliability	Effect Size	Sig.
<b>Higher Order Learning</b>	<b>4</b>	<b>3.05</b>	<b>3.09</b>	<b>2.99</b>	<b>.10</b>	<b>.83</b>	<b>.08</b>	<b>.085</b>
<b>Integrative Learning</b>	<b>5</b>	<b>2.62</b>	<b>2.75</b>	<b>2.43</b>	<b>.32</b>	<b>.73</b>	<b>.27</b>	<b>.000*</b>
<b>Reflective Learning</b>	<b>3</b>	<b>2.72</b>	<b>2.82</b>	<b>2.58</b>	<b>.24</b>	<b>.82</b>	<b>.16</b>	<b>.000*</b>

\*p<.05, 2-tailed significance

**Table 3: IUPUI Seniors**

Construct	# of Items	Mean (Overall) N=998	Mean (Service Learning) N=588, 59%	Mean (No Service Learning) N=410, 41%	Mean Difference (SL and No SL)	Reliability	Effect Size	Sig.
<b>Higher Order Learning</b>	<b>4</b>	<b>3.23</b>	<b>3.36</b>	<b>3.03</b>	<b>.33</b>	<b>.86</b>	<b>.24</b>	<b>.000*</b>
<b>Integrative Learning</b>	<b>5</b>	<b>2.81</b>	<b>2.99</b>	<b>2.57</b>	<b>.42</b>	<b>.72</b>	<b>.34</b>	<b>.000*</b>
<b>Reflective Learning</b>	<b>3</b>	<b>2.86</b>	<b>2.96</b>	<b>2.72</b>	<b>.24</b>	<b>.83</b>	<b>.16</b>	<b>.000*</b>

\*p<.05, 2-tailed significance