4-8-2013

Service Learning in Biology I and II: Effects on College Student Engagement and Accomplishment

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**Service Learning in Biology I and II**

**Effects on College Student Engagement and Accomplishment**

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**Conclusions**

SL ideas on which college students agree (average <2.5)
- Preparing science demonstrations helps me understand my biology course better.
- I am anticipating a fun night of science activities and I am excited to see how the children react to my presentation.
- This SL project helps me improve my course grade.

SL ideas on which college students disagree (average >2.5)
- It is pointless to teach young children because they are not interested.
- The only way for children to learn difficult concepts pertaining to science is through tests; hands-on learning is not effective.
- Most children say they would like to be scientists when they grow up.
- Science is not fun.

Largest areas of change (Pre→Post Surveys)
- More agreement
  - Children love science and enjoy learning.
  - Most children say they would like to be scientists when they grow up.
  - Preparing a science demonstration has made me more excites to study biology
- More disagreement
  - Science is not fun.
  - Young children are difficult to control and probably won’t listen to me since I am not a “teacher”.
- Parents will be more interested in the experiments than the children.

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**Table 1: Pre and post survey results regarding outcomes of the SL experience in Biology I and II.**

<table>
<thead>
<tr>
<th>Question</th>
<th>Pre Survey</th>
<th>Post Survey</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparing a science demonstration helps me understand my biology course</td>
<td>3.0 (4.5)</td>
<td>4.4 (5.6)</td>
<td>1.4</td>
</tr>
<tr>
<td>I am anticipating a fun night of science activities</td>
<td>4.0 (3.6)</td>
<td>4.7 (8.4)</td>
<td>0.7</td>
</tr>
<tr>
<td>I am excited to see how the children react to my presentation</td>
<td>2.6 (3.2)</td>
<td>2.3 (3.6)</td>
<td>0.3</td>
</tr>
<tr>
<td>Most children say they would like to be scientists when they grow up</td>
<td>4.9 (8.3)</td>
<td>4.8 (10.0)</td>
<td>0.1</td>
</tr>
<tr>
<td>Science is not fun</td>
<td>2.3 (2.9)</td>
<td>2.4 (1.9)</td>
<td>0.0</td>
</tr>
<tr>
<td>Young children are difficult to control and probably won’t listen to me</td>
<td>2.9 (1.8)</td>
<td>3.1 (2.1)</td>
<td>0.2</td>
</tr>
</tbody>
</table>

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**Table 2: NSU Volunteer Participant Survey given at the end of the Science Alive! night on 3/28/13 at Welleby Elementary School, Sunrise, FL in Broward County.**

<table>
<thead>
<tr>
<th>Question</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>I think our school should have more events like this</td>
<td>5.0</td>
</tr>
<tr>
<td>It is not only a great activity</td>
<td>5.0</td>
</tr>
<tr>
<td>I learned more and had fun</td>
<td>5.0</td>
</tr>
<tr>
<td>I can imagine myself doing the same at college some day</td>
<td>5.0</td>
</tr>
<tr>
<td>I had so much fun!</td>
<td>5.0</td>
</tr>
<tr>
<td>Possibly even more fun than the kids</td>
<td>5.0</td>
</tr>
<tr>
<td>I plan to return again next year</td>
<td>5.0</td>
</tr>
<tr>
<td>It was really fun and educational</td>
<td>5.0</td>
</tr>
<tr>
<td>Helps me improve my grade in BIOL I/II</td>
<td>5.0</td>
</tr>
<tr>
<td>It is most fun and educational</td>
<td>5.0</td>
</tr>
<tr>
<td>I learned many things and had fun</td>
<td>5.0</td>
</tr>
<tr>
<td>I would love to do this again for the community</td>
<td>5.0</td>
</tr>
<tr>
<td>I would love to be a science instructor in college</td>
<td>5.0</td>
</tr>
<tr>
<td>It was a great learning experience</td>
<td>5.0</td>
</tr>
<tr>
<td>I feel honored to know that I was helping children</td>
<td>5.0</td>
</tr>
<tr>
<td>It was a great opportunity for me</td>
<td>5.0</td>
</tr>
<tr>
<td>The experience helps me</td>
<td>5.0</td>
</tr>
<tr>
<td>I could see many children being interested</td>
<td>5.0</td>
</tr>
<tr>
<td>I plan to return again next year for service learning</td>
<td>5.0</td>
</tr>
<tr>
<td>I feel honored to know that I was helping children</td>
<td>5.0</td>
</tr>
</tbody>
</table>

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**Question**

Does service learning (SL) improve student engagement and accomplishment in the Biology I and II course sequence for Biology Majors?

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**Introduction**

Currently at least 30% of approximately 6.7 million college students surveyed nationwide report having completed some form of service learning (SL) throughout their college curriculum. In fact, many institutions of higher education have entire departments dedicated to the maintenance and tracking of SL opportunities and community partners. Being involved in SL projects to teach one’s major field of study, has been shown to improve the overall college experience for students leading to greater engagement and overall retention and satisfaction. College students benefit by becoming more actively engaged in their own learning process and directly experiencing the relevance of their own education, possibly even investigating future career paths or interests. The community partners benefit by gaining an excited and motivated workforce of volunteers, as well as long term relationships with universities. All aspects of society benefit from these SL educational opportunities. This is especially true for SL projects linked to K-12 science education, where the demand for “concept-based science outreach at the elementary school level” has never been greater.

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**Approach/Assessment**

In the courses, Biology I and II (BIOL 1500 and 1510) students created curricular units (based on Biology 1 or II course topics) and presented science demonstrations to elementary school students and their families at a Science Alive! community night event at Welleby Elementary School in Broward County, FL.

- SL Project was 5% of overall course grade; could be completed as a group/individual project.
- Pre- and Post-survey on student attitudes toward science education and the SL process.
- Curricular unit developed for elementary students to learn science; presented in class to peers and assessed (by peers and professor).
- Reflection Essay: Mandatory (Biology I) and optional (Biology II) participation in a Science Alive! event.

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**SL in Action**

A Biology I student (L. Odom) demonstrates her SL project “Blobs in a Bottle” to classmates in March 2012 (Fig. 1). This activity became part of the Science Alive! Community Night at Welleby Elementary School on 3/20/13 (Fig. 2). NSU students teach elementary school students about exfoliative reactions (Fig. 3). The 2013 Science Alive! Community Event Team, March 2013 (Fig. 4).

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**Conclusion**

Students on all levels had an exciting, interactive, and genuinely fun time exploring science through this course-linked SL program. College students gained an added sense of mastery over course content, while strengthening the community and fulfilling a need. Public speaking ability in college students was greatly enhanced as was their confidence levels as presenters. College students served as scientist-role models for the elementary school students, and directed groups of kids through activities of science exploration and discovery. Additionally, members of the University community were brought together (faculty, graduate students, undergraduate students, and alumni and friends) while sharing the excitement of doing science. It was readily apparent that everyone involved grew in some way during the SL process. Science Alive! family nights at Welleby Elementary School have grown in attendance and scope each year, attracting the attention of parents, as well as upper level school administration.

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**Literature Cited**


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**Acknowledgements**

This work has been supported in part by the Farough College of Arts and Sciences (service learning and faculty fellows programs). Thanks also to Dr. D. Simonet, Dr. L. Parins, Dr. Beattie, Dr. Schmitt, and the students at NSU.

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**Figure 1**

Students on all levels had an exciting, interactive, and genuinely fun time exploring science through this course-linked SL program. College students gained an added sense of mastery over course content, while strengthening the community and fulfilling a need. Public speaking ability in college students was greatly enhanced as was their confidence levels as presenters. College students served as scientist-role models for the elementary school students, and directed groups of kids through activities of science exploration and discovery. Additionally, members of the University community were brought together (faculty, graduate students, undergraduate students, and alumni and friends) while sharing the excitement of doing science. It was readily apparent that everyone involved grew in some way during the SL process. Science Alive! family nights at Welleby Elementary School have grown in attendance and scope each year, attracting the attention of parents, as well as upper level school administration.