

PEER-LED TEAM LEARNING EVALUATION

WHAT ARE THE BENEFITS OF PLTL FOR STUDENT LEADERS? A DISCRETE INQUIRY

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It has been widely proclaimed that the Peer-Led Team Learning Model of teaching and learning benefits everyone involved, the faculty, the student leaders and the students. The students in the class benefit from a comfortable working environment and a carefully structured learning experience, which improve their knowledge of the subject material and their grades. Leo Gafney has examined data from many PLTL implementations at dozens of schools and has shown that the students in classes that employ peer-led team learning always do better than students in comparable courses that use traditional teaching methodology. The percentage of students in PLTL classes that receive grades of A, B or C is in some cases remarkably higher than in comparison classes. One of the opportunities that lies ahead is to prove that the student leaders reap comparable benefits during their experience in the workshops. Many of us have claimed that leading workshops is a very beneficial experience for the student leaders, but to my knowledge the benefits to student leaders have not been carefully demonstrated. It is my hope, during the next phase of development and dissemination of the Workshop Model, that we will be able to detail the benefits of student leadership more fully.

First of all, what are the potential benefits of student leadership, as reported by the student leaders and the faculty involved in the PLTL Project? Each semester in my general chemistry course at Indiana University/Purdue University at Indianapolis (IUPUI), I asked my student leaders to write down the reasons why they applied for their student leader positions. In each semester, the primary reason why the students apply for the position is to review their general chemistry knowledge. The second largest number of responses indicates that the students are motivated by a desire to work with people. A surprisingly small number indicate that course credit or a cash stipend were determining factors in their decision to lead workshops. An end-of-course survey indicated that the student leaders unanimously think that they have satisfactorily received the benefits that they expected from the experience. Even student leaders who were not motivated by a desire to learn more chemistry report that they have increased their knowledge the subject.

During the PLTL Leadership Conference at Goucher College (MD), attendees were surveyed as to what they think the benefits of being a student leader are. The 43 people who responded provided an overwhelming list of purported benefits in the five minutes that they were allowed to brainstorm. The most common responses were:

- Increased chemistry content knowledge (35)
- More faculty contact (24) [is this really a benefit??]
- Increased communication skills (21)

- Confidence (20)
- Contact with other students (19)
- People skills (17)
- Leadership skills (16)
- Exposure to teaching (16)
- Resume impact (11)
- Process knowledge/Problem-solving skills (10)

One of my goals as a researcher in chemistry education is to try to quantify the aforementioned gains in chemistry content knowledge that the student leaders experience during a semester of being a workshop leader. Thus, I have composed a 26 item 'quiz' to evaluate the student leaders' competence in solving traditional general chemistry problems. These questions were selected from IUPUI's general chemistry test item bank by the faculty who teach upper division courses. They were asked to select those questions which most represent the prerequisite knowledge that they wished students would have after freshman chemistry. All the questions except one were multiple choice and covered a fairly wide range of topics. This 'quiz' was given to the student leaders during the pre-semester training meeting. The questions were never reviewed, nor were the student leaders told how they did on the exam. The exact same exam was given to the student leaders during the final staff meeting of the semester, fifteen weeks later. The average score increased significantly for the group of student leaders who were tested.

Performance of Student Leaders-Pretest average

C105	C111 Exam Questions
71.2%	76.8%

These data are certainly indicative that the student leaders are increasing their knowledge of chemistry content, even though the improvement is not as dramatic as I might have expected. The quality of the student leader experience was more emphatically demonstrated by comparing students who had been student leaders to chemistry students who had not been student leaders. Faculty gave the appropriate prerequisite test questions to their classes on the first day of class. As the table below shows, the student proficiency at solving general chemistry questions is quite disheartening. Senior level and graduate students in the inorganic course average about 50% on these basic questions.

I would certainly argue that our typical students begin forgetting what they have learned as soon as the course ends. Being a workshop leader provides a critical reinforcement of key concepts that seems to prevent the deterioration of knowledge over time.

Performance of IUPUI Students

C105/C111 Exam Questions		
<u>Course</u>	<u>Number of Students</u>	<u>Average Score</u>
Organic	120	41.4
Physical	13	50.5
Inorganic (non-leaders)	11	52.5
Inorganic (WS leaders)	3	73.1
WS Leader Course (post-test)	39	76.8

As I have said many times to colleagues, I have looked very superficially at the simplest of leader gains. Although I find this evidence compelling, there are certainly many opportunities to delve further into this and similar studies. Hopefully other schools will start testing their students in a similar manner to see if these results are general. My intention is also to modify the leader training program to enhance the content knowledge gains for the leaders. The greater challenge is to demonstrate the other gains that the student leaders experience. Although I am experienced in testing the content knowledge of students, testing a student's communication and leadership skills is not something I have yet attempted.

For those readers who wish to participate in this research or desire more information, contact me at the e-mail listed below. I am now the chair of the Chemistry Education Program at Texas Tech University in Lubbock, Texas.

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