PEER-LED TEAM LEARNING IMPLEMENTATION

EXPANDING THE PLTL PROGRAM AT NORTHEASTERN ILLINOIS UNIVERSITY: ARTICULATION BETWEEN DEPARTMENTS

STEFAN TSONCHEV AND EMMA TURIAN

During the PLTL conference in July 2009 at The City College of New York, we heard many interesting talks about implementations of the Peer-Led Team Learning (PLTL) approach in a variety of schools, many of them possessing unique study environments characteristic to their student composition and/or geographic location. We were fascinated to find out the multitude of ways in which the PLTL approach was implemented in those institutions, and by the success they had with it. We were also given the opportunity to speak about the implementation of PLTL at Northeastern Illinois University (NEIU), which we summarize in this article. Our hope is that teachers elsewhere who work in an environment similar to ours may face the same challenges that we did, and may benefit from our experience.

PLTL was implemented in the Chemistry Program at NEIU several years ago. This was done by introducing separate seminar courses to accompany the courses of General Chemistry and Organic Chemistry. These seminars are supervised by Peer Leaders and represent workshops where students work on assigned problems in small groups. Despite the fact that it is still not known which elements of the PLTL method work best and are responsible for its success, it was quickly noticed that students who attend the seminars do better in the corresponding courses. Moreover, the PLTL model of instruction has been shown to benefit not only the students in the workshops but also their Peer Leaders, who gain valuable teaching experience and strengthen their knowledge of the subject. The Peer Leaders are typically selected among the best students who have taken the course in one of the previous years. Usually, in courses with large number of students it is not hard to find candidates for such a job.

However, an interesting situation occurred at NEIU with the implementation of PLTL to the higher level undergraduate courses, when one of us (ST) decided to do so in the Physical Chemistry course sequence. Typically, these courses are considered the most difficult in the undergraduate chemistry curriculum, and most students tend to postpone taking them until they are ready to graduate. Thus, most students in the Physical Chemistry courses are seniors, with a small fraction of them being at the junior level. In addition, the classes here are much smaller than the lower lever classes, on the order of about 20 students. Such circumstances make it very difficult to find appropriate Peer Leaders for these courses, as there are few potential candidates who have gotten the desirable high grade in the course and are still on campus the next year, unlike most such students who are graduating and are no longer available to be employed as Peer Leaders. A teacher facing such a challenge will need either luck in finding appropriate Peer Leaders, or will have to be very flexible in implementing the PLTL approach. We were, indeed, lucky to have one of our best students around for a couple of more years after graduation when he joined our MS program and was able to serve as a Peer Leader for Physical Chemistry. Then, another one of our very best students took these courses in his junior year, and is currently leading the Physical Chemistry seminar. However, it is clear that we

must allow a lot of flexibility in the PLTL method if we would like to be able to implement it at all levels of the undergraduate curriculum and in all courses where students can benefit from it. If necessary, a teacher must be prepared to take the role of a "peer" leader himself, to invite a Peer Leader from another department, or do whatever is necessary to make sure the method of learning through team work is provided to the students who are willing to participate in it.

Another department at NEIU to implement the PLTL approach was Mathematics. There, the same strategy as described above has been used as far as implementing the PLTL model, except that it is currently offered in connection with courses that are not close to graduation. Since these courses are not the most advanced, the Math Department does not have to deal with the same type of challenges that the Chemistry Department does. As usual, the faculty members meet with the Peer Leaders for one to two hours per week to discuss the modules that are going to be presented to the students. Currently, there are only one or two faculty members per subject area from the Mathematics Department involved in PLTL. The PLTL sessions are not mandatory; therefore, the students have the option of registering for these seminars, which count as much as one credit hour each. The Math Department's system is somehow different from that in Chemistry in the sense that students in each group come from all classes of the same subject area. In this way, each student has the opportunity to discuss within their group the alternatives presented to them in class by their professors. The PLTL model also gives our students the opportunity to improve their cognitive and social skills, as well as their ability to make better connections between different mathematical topics offered in our school.

Statistics show that students who participated in these seminars showed great improvement in their performance in the corresponding classes. The incorporation of the Peer Led Team Learning model has significantly increased student interest and participation in the seminars (up from the 3-8% of those enrolled in the parallel Calculus or Precalculus courses historically), especially at the Calculus level. Student participation (and the percentage of potential students participating) is given in Table 1:

Term	Number of seminars	Number of students completing the seminar	Percent of the course enrollment
Fall 2004 Precalculus	4	27	11.9
Fall 2004 Calculus I	3	19	17.8
Spring 2005 Precalculus	3	14	6.9
Spring 2005 Calculus I	3	14	15.7
Fall 2005 Precalculus	3	20	9.2
Fall 2005 Calculus I	3	23	20.7
Spring 2006 Precalculus	2	11	6.2
Spring 2006 Calculus I	3	24	19.8

Table 1. Student Participation in Seminars, and percent of the course enrollment, 2004-2006, for Precalculus and Calculus I

Female students tend to be more likely than their male counterparts to participate in the seminars. Table 2 summarizes the percentage of women in the classes and seminars (based on initial enrollment numbers):

Term	Percentage of women in seminar	Percentage of women in class
Fall 2004 Precalculus	63.0	45.8
Fall 2004 Calculus I	52.4	51.4
Spring 2005 Precalculus	57.1	57.4
Spring 2005 Calculus I	71.4	44.9
Fall 2005 Precalculus	55.0	53.7
Fall 2005 Calculus I	54.2	54.0
Spring 2006 Precalculus	72.7	52.2
Spring 2006 Calculus I	37.5	47.9

Table 2. Participation by women in Seminars and in Class, shown as percentages, 2004-2006, for Precalculus and Calculus I

Students who participate in the seminars tend to have higher grades in Calculus and Precalculus. A comparison of the average grades in Calculus or Precalculus for students in the seminars with the overall average grades in the courses is given in Table 3 (excluding incompletes and withdrawals):

Term	Grade points for seminar participants	Grade points for all students
Fall 2004 Precalculus	3.08	2.62
Fall 2004 Calculus I	3.16	2.78
Spring 2005 Precalculus	2.1	2.58
Spring 2005 Calculus I	3.36	2.62
Fall 2005 Precalculus	2.63	2.51
Fall 2005 Calculus I	2.81	2.53
Spring 2006 Precalculus	3.25	2.47
Spring 2006 Calculus I	2.56	2.39

Table 3. Comparison of Grades for Seminar Participants vs. Grades for all Students, 2004-2006, for Precalculus and Calculus I

This grade improvement may be more significant than it appears, given that the students who enroll in the seminars appear to be, on average, less prepared. For those students for whom we have ACT scores (those who come to NEIU as freshmen) we observe, in general, a one point difference in the averages of those enrolled in the seminars compared with the overall averages for the students in the parallel courses. Table 4 summarizes this data:

Term	Mean math ACT - seminar participants	Mean math ACT - all students in course
Fall 2004 Precalculus	17	20
Fall 2004 Calculus I	22	23
Spring 2005 Precalculus	19	19
Spring 2005 Calculus I	21	21
Fall 2005 Precalculus	19	20
Fall 2005 Calculus I	20	22
Spring 2006 Precalculus	18	19
Spring 2006 Calculus I	20	21

Table 4. Mean Math ACT scores of students participating in Seminars in comparison to all students in course, 2004-2006, for Precalculus and Calculus I

Based on the success of PLTL at NEIU, currently several more departments here have expressed strong interest in implementing the approach in their curriculum. We think that collaboration between them and the departments which have already been using the model for a few years would be the best way to expand the PLTL program on our campus. We also understand that each one of these departments, or instructors, introducing the method to their courses may have to figure out for themselves what is the best and most efficient way to implement the approach in view of the specific environment for their courses. It is our hope that some of them may benefit from our experience, and we look forward to hearing of new challenges and interesting ways of applying the PLTL method in the classroom.

Acknowledgments

We wish to acknowledge the support of our institution which allowed us to be part of this educational activity. Special thanks to Professors Nancy Wrinkle and Ana Fraiman, who organized our trip to New York, and to A.E. Dreyfuss, who hosted this very informative event. Thanks are due to David Rutschman and Lise Jensen for compiling and providing us with the PLTL data for the NEIU mathematics courses.

Stefan Tsonchev, Department of Chemistry
Emma Turian, Department of Mathematics
Northeastern Illinois University

Cite This Article as: Tsonchev, S., Turian, E. (2012). Expanding the PLTL program at Northeastern Illinois University: Articulation between departments. Peer-Led Team Learning: Implementation. Online at http://www.pltlis.org.
Originally published in *Progressions: The Peer-Led Team Learning Project Newsletter*, Volume 10, Number 4, Summer 2009.