PEER-LED TEAM LEARNING
INTERNATIONAL SOCIETY

POSTERS

1. **Chemistry Boot Camp**

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Peer-Led Team Learning (PLTL) has dramatically improved student success in general chemistry at the University of Texas at El Paso. Every student spends two hours per week in lecture and two hours per week in PLTL Workshop. Thus the job of peer leader is extremely important and involves an enormous responsibility. Despite being knowledgeable and prepared (the conditions for being hired), the peer leaders are still undergraduate students and have weaknesses in certain topics. Chemistry Boot Camp is designed by experienced peer-leaders to be an intensive week of chemistry review designed to make all peer leaders excel at any topic in General Chemistry I and II. By the end of Boot Camp all peer leaders will feel extremely comfortable managing any subject in chemistry and will feel secure and prepared to conduct workshop in the most effective manner, improving the quality of the peer-leaders, the workshop and ultimately the students.

2. **HELP: Higher Education and Liaison Program**

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As a result of attending and experiencing the First Annual PLTLIS meeting in Brooklyn, New York in May of 2012, the authors, peer leaders and students from the University of Texas at El Paso, were inspired to start this college preparation program at Bowie High School in Central El Paso. HELP targets the primarily low-income learners that make up the student body at this school. In fall 2012 the authors prepared the way by meeting with the Principal and many teachers and developing much of the curriculum based on hands-on learning in math and science. In eighteen weekly sessions, HELP provided activities, guidance, and motivation in spring 2013 to inspire the students to consider going to college and how to be successful when they did. We will present the results of this project and discuss the effect it had on the participants.

3. **How can students in a mathematics workshop be motivated to raise their expectations of their performance?**

Yanna Chen
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From the beginning of the semester the whole workshop group divided into three sub-groups. Each group included students at different levels of mathematical skills, where one received below 70 on the first exam, one between 70-80, and one between 80-90. Is there a way to help students to become more motivated and get higher level grades (from B to A)? This poster discusses how the Peer Leader can motivate and challenge students to become more interested in math with harder questions that lead into better discussions, increasing their interest, competence, and autonomy. Having students work in the sub-groups helps them with relatedness. Whether skilled or unskilled, students will try their best to find the solution to the problem which will increase their motivation, which will also increase their interest in mathematics and lead to higher grades.

4. **How can the workshop setting support female students to persevere In a college algebra and trigonometry course?**

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Because I am a Mathematics Education major, I take many Math courses. I have observed that as the course level is more advanced there are fewer female students. Being a female in a class of mostly male students sometimes feels scary, as though one is on a planet where I am the alien who does not belong. Historically, the field of mathematics has been dominated by men, so women may feel the subject is incomprehensible. However, mathematics intrigues me, and it is quite comprehensible. The problem is that because women have a negative attitude toward math in the United States, they tend to perform poorly (Kiefer & Sekaquaptewa, 2007). The

female population has reduced its desire to pursue mathematics due to its belief in stereotypes. This poster will present the argument that peer-led workshop in mathematics is a source of encouragement and perseverance for female and male students.

5. Mathematics Undergraduates Leading Undergraduates enrolled in General Chemistry: Why this Works!

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NYC College of Technology is the designated college of technology of the City University of New York. Peer-Led Team Learning (PLTL) is a structured learning method to engage students in a collaborative environment. PLTL has been used in several courses at the college, including General Chemistry and Mathematics. The implementation in Chemistry is that workshops are optional and/or mandatory outside of class time. The problem being addressed is the following: Is the first exam or second exam in General Chemistry II an indicator for passing the course? The approach used depends on recognizing that peer leaders with strong math problem solving skills give students insights in connecting chemistry concepts (such as kinetics and equilibrium) to math. These concepts are assessed on the second exam. Students in courses with workshop show significant improvement than students without workshop. The data indicates that PLTL workshops increased student retention and passing rate.

6. Peer Leading: Promoting Student Success through Enhanced Understanding of the Course Material

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Peer Led Team Learning has proven effective in enhancing student performance in Freshman STEM courses. General Biology 1 is a course with an average passing rate (C or above) of ~40% at UHD. With the implementation of PLTL supplemental workshops, the success rate improved to 60% in the Fall of 2012. We believe that the PLTL played a significant role in enhancing students' understanding of the course material. By the commitment and dedication of motivated peer leaders various strategies were developed to benefit General Biology 1 students. In turn, workshop modules provided on the PLTL website were updated and customized to fit the General Biology students' academic needs. Students who attended PLTL sessions have acknowledged their effectiveness and enjoyed the activities. Lastly, activities and sessions have significantly attributed to the benefit and growth of personal and academic endeavors of the peer leaders as well.

7. Peer Leaders' Views on a General Chemistry Workshop Program

A.E. Dreyfuss and Janet Liou-Mark
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How do Peer Leaders feel about a peer-led workshop program in General Chemistry? Peer Leaders were surveyed about the administrative aspects of the program, including physical space, compensation, and training, the benefits they derived from the experience, why they decided to become Peer Leaders, and suggestions for ideas for program expansion and improvement.

8. Peer-Led Team Learning Influence on Future Teachers

Amairani Hernandez, Karen Orta, Sara Wilder
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The overall experience of future teachers leading PLTL workshops help them to acquire the essential leadership skills, understanding of core materials, and adaptation to students' different learning styles which are necessary to become effective teachers. In order to conduct effective PLTL workshops, leaders must acknowledge various approaches to understanding material which is an important component in teaching in a regular setting. Experience with PLTL workshops allows future teachers to adjust to student's needs by understanding learning styles, personalities, and their difficulties with material. Therefore, PLTL philosophy is a wonderful model for traditional teaching to embrace.

9. Strategies for Assisting Students with Learning Difficulties and Differences

Grace England
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Common characteristics of students with varying learning disabilities or differences will be described. Leaders will be given several instructional techniques or strategies to use in supporting such students to enhance their achievements in higher education classes.

10. Students' Attitudes About Peer-Led Team Learning Workshops in Chemistry: Comparison to the Six Critical Components

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While tracking performance and persistence among students is important to determine the effect of the incorporation of workshops in courses, there has been little published on students' attitudes toward workshop. How do students perceive PLTL workshops? This poster will present a three-semester study, based on Gafney's Student Survey (2001) on how students view workshop in their introductory chemistry courses. Survey questions and responses are organized and compared to the PLTL model's Six Critical Components.

11. Students' Attitudes About Peer-Led Team Learning Workshops in Chemistry: A Critical Incident Study

A.E. Dreyfuss and Janet Liou-Mark
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What engages General Chemistry students about peer-led workshops? What do they dislike about peer-led workshops? Using Brookfield's (1995) Critical Incident Questionnaire, this poster will present the aggregated results of two semesters of responses from General Chemistry students, which found that students felt engaged when "working in groups," "solving problems" and "asking questions." They felt disengaged when they "didn't understand specific material."

12. Ten Year Cumulative Analysis on the Implementation of PLTL in Biology Undergraduate Education

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Several studies have shown that students who participate in PLTL workshops perform a letter grade higher than those who do not participate in PLTL. However, no meta-analyses have been performed to show the overall effect PLTL has on student performance over a decade. Per-term analyses of the effect of PLTL on learning in biology courses at Florida International University have shown that students who take PLTL outperform those who do not fully participate in PLTL, which is consistent with published literature. A cumulative meta-analysis over 10 years shows that PLTL participants are approximately twice as likely to pass our gateway biology courses, versus those who do not participate in PLTL. These finding indicate that the use of Peer Leaders as facilitators is an effective learning strategy in undergraduate STEM education.

13. The Evolution of PLTL: Peer Leader-Professor Group Meetings and the Effect of Size

Andre Perez-Orozco, Samuel Garcia,James E. Becvar, and Geoffrey B. Saupe
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The Peer-Led Team Learning program in Chemistry at the University of Texas at El Paso requires two one-hour "preview" meetings every week between a course's group of Peer Leaders (PLs) and the professors of the course. The meetings help keep PLs on track and provide an opportunity for feedback, to and from PLs and professors. The rapid expansion in the number of students in our chemistry classes has led to the need for more PLs and larger preview meetings. We found that the dynamics of the preview meetings had lost their efficacy and were not conducive to free expression, optimization, and innovation. The preview meetings were to evolve in order to remain optimal. By infusing the meeting with some of the characteristics of the PLTL workshops and by using adaptive leadership, many problems were alleviated. Here we present the details of our program changes and the results.

14. The Formative Assessment of Readiness (FAR) Examination

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For the past several semesters, some sections of second semester general chemistry at the University of Texas at El Paso have used the Formative Assessment of Readiness (FAR) Examination as method of assisting students in the course and peer-led workshops to prepare and to keep current on a class-by-class basis. The FAR Examination consumes the initial five minutes of every class session to assess understanding of the material from the previous class. We report a significant correlation between the use of FAR exams and increased performance in course. Students who perform well on FAR Examinations throughout the semester have higher scores on the hour examinations and standardized final examination. We conclude that the use of FAR exams reinforces material that is learned in class, increases pressure on students to pre-read, study and review, and results in higher test scores and retention rates.

15. "The War of the Workshops"

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Peer leaders in the Peer-Led Team Learning (PLTL) program at the University of Texas at El Paso have developed many strategies over the years to motivate students to operate at their full potential. Motivating students is crucial for their learning. As one example, peer leaders have set up problem solving competitions within the workshop, but this 'internal-to-workshop cohort' strategy does not function well if it does not percolate through

most of the cohort. Because our workshop schedule most often finds two workshops running in parallel (at the same time), this semester we implemented competition between workshop cohorts. As a control, each peer leader in this study used a second workshop for comparison that did not conduct competitions between workshops. The 'between workshop cohorts' competition results in greater engagement of students within the competing cohorts and causes students to be prepared and to study outside of class.

16. Transmission: A Stronger Learning Modality

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A typical introductory college course: 100 students in a lecture hall listening to the instructor for approximately an hour. This setting can be categorized as students in a mode of **"reception"**. Reception involves little engagement of the students and yields outcomes of lower assimilation, grasp of material, reduced interest and reduced retention, particularly in STEM disciplines. In contrast, Peer-Led Team Learning increases comprehension and retention by fostering an environment of **"transmission."** The "transmission" mode of curricular dissemination requires students to be active participants in the teaching of the material. In this "transmission" setting, students in 16-student workshops must mentally process, then communicate with their team members, the peer leader, and others within the workshop cohort through oral explanations, Socratic question and answer sessions, or written work. The "transmission" mode complements the "reception" mode prevailing in lecture; with the overall outcome being the maximization of understanding of the material.

17. Turning the Tables: Making Problems Solves Problems

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The PLTL program in general chemistry at the University of Texas at El Paso encourages its Peer Leaders (PLs) to incorporate their innovations into the fabric of their workshops and to share their experiences with the other PLs. Our PLs have turned the tables on traditional lecturing by forcing students to transmit their knowledge to each other, rather than passively receive it from a lecturer. One way to invoke this awakening transmission is by getting students to create their own written problems in the PLTL workshops, right beside their peers. Students then trade questions within their team or with other teams, so they can be solved. The ability to create and write a reasonable chemistry question forces a higher level of comprehension, a vital perspective, and deeper learning. Once a student can generate and teach the material, they have truly mastered it. We will share our experiences with this method.

18. ULearn via PLTL UTeach

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Teaching is often seen as the process of providing facilitated information to receivers (students) with the objective of having the receivers fully understand an idea or process. Just because all the information is delivered does not make the receiving students into learners. A great strength of Peer-Led Team Learning is forcing every student in Workshop into the teaching role. The act of teaching is well-known to make teachers into excellent learners. Being a teacher stimulates extra cognitive processes because the person needs to understand in order to deliver the information. In addition, when the teacher is questioned about specific details, such questions help to identify areas in which reinforcement of understanding is needed. Technology such as the Livescribe Echo pen permits students to record a complete notes database as another mode of delivery to refresh the learning. Teaching as a learning technique generates better understanding and longer retention of information.

19. Using the PLTL model through online workshops

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Online CS workshop sessions cater to students who want a better understanding of material and concepts covered in class. Often times, especially if Computer Science is not their major, students have difficulty comprehending key points in the lecture because the topics can be complex. This can be the cause of a chain reaction of failure due to the way programming assignments and concepts build upon themselves. Online workshops take students step by step through their assignments in a way that allows them to be the main contributor to its completion. Using the Wimba Collaboration online system through blackboard, the workshops utilize the PLTL model where students are guided toward an answer instead of it being handed to them. Simultaneously, students are granted a level of special attention they may not have received in class. Wimba features chat, whiteboard, and screen-sharing capabilities that allow workshop leaders to interactively communicate key ideas to the students. The end

goal is to help students solidify the material through experience and grant them the help they need to develop independent programming skills necessary in future endeavors.

20. Vision and Change: Enabling Student Success via Peer-Led Team Learning

Stephanie Moreno, Geoffrey B. Saupe, and James E. Becvar
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The vision is improved student success. The desired change is enabling stronger student self-learning. This vision is being realized by the change in curriculum format (starting in year 2000) to require Peer-Led Team Learning Workshops in first semester general chemistry at the University of Texas at El Paso. The C-or-better passing rate for first-time takers increased from the historic average near 55% to the current rate near 70%, translating into more than a thousand additional students over this period progressing into their science, engineering, and mathematics majors. The majority of the science students in these PLTL workshops at UTEP are biology majors (eventually receiving biology, microbiology, or cellular and molecular biology degrees). Workshop consists of one hour of problem solving in teams overseen by the Peer Leader, followed by one hour of hands-on explorations. Explorations provide the students with real world contextual knowledge about the abstract concepts they are learning.

21. Voluntary PLTL Workshop in Organic Chemistry

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The organic chemistry curriculum at the University of Texas at El Paso reverted to lecture only in fall 2012 when external funding ended and the financial support concluded for paying peer leaders to give workshops in organic chemistry courses. The recently graduated first author noted this loss with dismay and sought and received permission from the instructor to create a voluntary workshop approach integrating multiple educational techniques. Students from majors and non-majors organic courses were invited to attend two-hour workshop discussions over a ten-week period covering content, metacognition, humor in the classroom (with the goal of making students more receptive and physiologically better equipped to learn), and behavioral modification techniques. Multi-week tests were implemented to reinforce and review concepts multiple times. A statistical analysis of students' performance showed that students who attended workshop outperformed those who did not on hour examinations and on the final examination ($p < 0.02$).

22. What Can the Peer Leader Do To Increase Female Involvement in a Statics Workshop?

Khalil Rouchdy
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Perry's Scheme (1970) suggested four major developmental stages for college students' cognitive and ethical development. In my workshop in Statics I (applied physics in construction management), the female students were disengaged and quiet among the male students. Belenky et al, Baxter-Magolda and Kroll base their work on Perry's scheme, examining females in their intellectual development, and add to his four stages. This poster explores ways to involve female students in male-dominated courses and fields, through peer-led workshops by encouraging students to acknowledge and engage with each other.

23. What techniques can the Peer Leader use to support students' learning in workshop?

Frederic Anglade
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Students need the support of Peer Leaders in the process of learning. Peers Leaders are students who are more knowledgeable than the students in their group. Peer Leaders understand their students' need to learn the course materials and want to guide them in order to help them succeed. As a Peer Leader, I created a friendly environment in my workshop to help students to feel comfortable to work on their modules. To achieve that, I used various techniques to create a team. This poster discusses selected theories and techniques that Peer Leaders can use to help students learn course material.