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Abstract

Peer-Led Team Learning (PLTL), a nationally recognized teaching and learning model, was introduced into the General Chemistry course at Pace University in 2014. The objective of this study was to determine the effect of the introduction of PLTL on the students' final exam scores, and through surveys, determine how students viewed both the PLTL program and their Peer Leaders. In addition, this study sought to monitor the progress of Peer Leaders as they entered an upper-level Inorganic Chemistry class to determine whether the experience of being a Peer Leader helped their success in this course. The biggest difference, when comparing exam scores from two separate years before and after PLTL implementation, was found to be 10%. However, upon averaging exam scores over several years before and after the introduction of the PLTL program, a more modest average increase of 4% was determined. It was found that students with Peer Leader experience performed better in an upper-level Inorganic Chemistry class compared to those with no Peer Leader experience. Results from surveys administered to both students and Peer Leaders regarding their experiences, as well as the results from students evaluating their Peer Leaders, are reported here. Overall, the implementation of PLTL has led to greater interactions between the Instructor, Peer Leaders, and undergraduate students, thereby furthering a greater interest in chemistry and increasing the students' sense of community.

Keywords: Peer Leaders, General Chemistry, Inorganic Chemistry, PLTL, Chemical Education Research, Leadership, Exam Score

Introduction

PLTL is a nationally recognized model of teaching and learning, first developed in Chemistry at the City College of New York in 1991 (Gosser, et al., 2010; Gosser & Roth, 1998). The model is underpinned by cognitive theories that contemplate the power of social interactions (Vygotsky, 1962), distributed intelligence (Hutchins, 1995), and cognitive apprenticeship (Collins, 1991) that aid in the ability to understand concepts. The six critical components of PLTL are that: (1) the Peer-Led Workshop is integral to the course, (2) faculty are involved, (3) Peer Leaders are trained, (4) workshop materials are appropriately challenging, (5) workshops (ideally, 6 – 8 students per group) meet weekly at a scheduled time (variably, 45-120 minutes) in a suitable space, and (6) the program is supported by the Institution (Yusufova, 2012).

Another model, Supplemental Instruction (SI), was developed by Dr. Deanna Martin in 1973 at the University of Missouri at Kansas City, and also intentionally lends Peer Leaders as support in classes (Blanc & Martin, 1994). Rather than targeting high-risk students, this approach targets high-risk courses, where typically 30% of students enrolled in a class either withdraws, fails, or barely passes. A student who has previously taken the course, and has demonstrated competence, is selected as a Peer SI Leader, and attends the lecture and conducts review sessions outside of class that students attend on a voluntary basis. A third model is the Learning Assistant program, which was developed by physicists at the University of Colorado-Boulder. Learning Assistants, who are undergraduate students, are employed to facilitate discussion among groups of students in a variety of classroom settings that encourage active engagement (Langdon, 2014). A fourth model is Team-based Learning (TBL), which is designed to support the development of learning. TBL employs different phases that involve independent study, group tests and application activities that teams work on together (Whitley et al., 2015). Choosing among programs, PLTL for students is well documented and multiple studies have determined the positive impact of this program on both students and Peer Leaders (Dreyfuss & Fraiman, 2015; Liou-Mark, et al., 2018).

At Pace University, PLTL was first incorporated in Biology 101, which is a large lecture-format freshmen-level course (>100 students) in 2004. A Discussion Group program, using the PLTL model developed by Gosser and Roth (1998), was added to the Biology 101 course. The overall finding following PLTL implementation in Biology 101 was that it enhanced conceptual reasoning skills and the overall performance of the students in the course (Peteroy-Kelly, 2007).

The author of this manuscript attended and received training at a two-day PLTL Institute event (City College of New York) led by David Gosser in 2014, the same year that PLTL was introduced into the General Chemistry course at Pace University. The author also recently attended a PLTL International Society (PLTLIS) Conference that was held virtually (June 2–4, 2021), and presented a paper that summarized the data collected at Pace University that are reported here.

This study sought to determine the effect of the introduction of PLTL on the students' final exam scores, and through surveys, determine how students viewed both the PLTL program and their PLTL Peer Leaders. In addition, this study sought to monitor the progress of Peer Leaders as they entered their upper-level classes and to determine whether having had the experience of being a Peer Leader helped them in their undergraduate studies.

Methods

The six critical components of PLTL were implemented at Pace University in the following way:

(1) Peer-Led Workshops (referred to as "Discussion Groups") were a required part of the course and were listed on the Course Schedule website. All General Chemistry students were enrolled in lecture, laboratory, and Discussion Group sections. The Discussion Group work (attendance, homework completion and participation) contributed to the students' grade (10 %).

(2) The PI met with the Peer Leaders on a weekly basis to discuss pre-assigned homework and workshop material. A particular enjoyable aspect of this component is getting to know the students who continue in their peer-leading roles over several years during their undergraduate careers at Pace University.

(3) The author recruited students who had performed well in General Chemistry I & II to be Peer Leaders in the following academic year. Peer Leaders were trained in a daylong session before the Fall Semester. Peer Leaders were trained to engage undergraduate students in the discussion of the problems, and to have students participate in highlighting their own particular process of solving a question, rather than to give out answers.

(4) The material that was used was adapted from that previously developed (Gosser, Strozak, & Cracolice, 2005). The material included concepts, problems and equations that were discussed in the lecture section.

(5) The Discussion Groups met on a weekly basis (one hour/week) in classrooms assigned by the Scheduling Department (room numbers were listed on the Class Schedule website). Due to financial restrictions, groups would sometimes comprise 12 students, rather than

the optimal number of 6 – 8 students. All students enrolled in General Chemistry sections were required to enroll and attend the weekly Discussion Groups.

(6) The Discussion Groups were supported by the department and by the institution, with Peer Leaders receiving a stipend covering approximately 4 hours work per week (1 hour with the faculty member and other Peer Leaders, 1 hour with their groups of students, and another 2 hours for any preparatory work). On a weekly basis, the Peer Leaders submitted an Excel worksheet (recording weekly and cumulative scores of their students) and a Word document that is a written journal account of student performance.

The success of the implementation of PLTL in a General Chemistry course was evaluated by examining students' exam results and by analyzing surveys administered to both students and Peer Leaders.

Final Exam Scores

Final exam scores were examined before implementation of PLTL (2011 – 2013) in a General Chemistry II course offered every Spring semester, and after PLTL implementation (2014 – 2017). It is possible to compare these data over several years because (i) the same instructor was teaching the course (the author), (ii) the same or similar exam questions were given each year, and (iii) the exam was administered in-person, retrieved, and not made available either in paper or electronic form after the exam, so students in subsequent classes did not have any prior knowledge.

Surveys

The questions posed to both students and Peer Leaders in the surveys are provided in Appendix A in Supporting Information. In general, students and Peer Leaders were administered surveys in which they were asked to rate statements according to a Likert scale (5 = strongly agree; 4 = agree; 3 = neutral; 2 = disagree; 1 = strongly disagree). Short-response questions and excerpts of answers can be found in Supporting Information for Students in Appendix A, and Peer Leaders in Appendix C.

Student Evaluations of PLTL Discussion Groups

At the end of the Spring 2014 semester, after the introduction of PLTL, a survey was administered in class to students who were enrolled in the course. The students were asked for information regarding their declared major and their current undergraduate year at Pace University. The students were either majoring in Biology (28 students; 43.8%), Forensic

Science, (11 students; 17.2%), Biochemistry (6 students; 9.4%), Chemistry (3 students; 4.7%), Psychology (4 students; 6.3%), Economics (1 student; 1.6%), or Computer Science (1 student; 1.6%). Some students had not yet declared their major, or else their major was unknown (7 students; 10.9%), and others had declared themselves as post-baccalaureate students (3 students; 4.7%). Of the 64 students enrolled in the course, 32 were freshmen (50.0%), 10 were sophomores (15.6%), 5 were juniors (7.8%), 1 was a senior (1.6%), and for 16 students (25%) this information was not known. Thus, in general, many students are Biology majors, and most students are in their freshman year or sophomore years. Fewer students are in their junior and senior years, and these students tend to be Computer Science, or Economics majors who leave this course to the end of their four-year undergraduate career. In contrast, for natural science majors, students are required to take Biology and General Chemistry at the same time and at the start of their undergraduate careers. All students who were present in class were surveyed, resulting in 51/64 respondents (80% response rate).

Student Evaluations of Peer Leaders

Students submitted on-line evaluations of their Peer Leaders. This evaluation is university-wide and students in all courses listed on the Class Schedule website are required to evaluate their course Instructors. For the Discussion Groups, the course "Instructors" are the Peer Leaders. Student responses to 14 statements were averaged for the groups of Peer Leaders in 2014 *versus* 2019. In 2014, 8 Peer Leaders served in this role, whereas 13 Peer Leaders served in 2019. The individual statements that the students rated according to a Likert score as well as excerpts of student quotes evaluating their Peer Leaders can be found in [Appendix B, and examples B (2014), examples C (2019)] in Supporting Information.

Peer Leader Response to PLTL

Peer Leaders were surveyed in 2019 about their experience as Peer Leaders and asked to rate 6 statements on a Likert-type scale (n = 13; 100% response rate). Further comments and quotes from this survey are provided in Appendix C in Supporting Information.

Performance of Peer Leaders in Upper-Level Classes

The impact of having been a PLTL Peer Leader on student success in upper-level courses was explored by examining overall scores of students with and without previous (or current) Peer Leader experience in an Advanced Inorganic Chemistry course. This course was selected as the author teaches Advanced Inorganic Chemistry in addition to General Chemistry, and therefore has access to student scores in this upper-level class. Data were

collected over a 4-year period (n = 29, including 10 students with previous or current Peer Leader experience). The students were divided into two groups (students without and with previous or current Peer Leader experience), and exam scores accrued over a 4-year period were analyzed.

Data Analysis

Results are calculated as the mean ± the standard error of the mean (SEM). Significant differences are determined by *t*-test, with $P < 0.05$ defined as being statistically significant. The analyses were performed using Prism GraphPad (version 4) and Excel (version 16.54) software. This research was determined to be exempt by the Pace University Institutional Review Board.

Results

Comparison of Exam Results Before and After PLTL Implementation

Final exam scores over several years were examined before and after PLTL implementation. The biggest difference occurred when comparing final exam scores in 2011 (58.53%; before PLTL implementation) compared to 2015 (68.21%; after PLTL implementation), giving rise to a difference of approximately 10%. On averaging scores over several years before (2011 – 2013) and after (2014 – 2017) the introduction of PLTL Discussion Groups, an average increase of 4% is observed (Figure 1). Previous studies have reported an average increase across several institutions of 14% following incorporation of PLTL, although some separate institutions reported similar increases to our observed values (Gosser et al., 2010). After PLTL implementation, the final exam scores were 65.86 %, 68.21%, 65.63 % and 65.30 %, in 2014, 2015, 2016 and 2017, respectively. Prior to PLTL implementation, the final exam scores were recorded as 58.53%, 64.51 % and 61.67 % in 2011, 2012 and 2013, respectively. Interestingly, the final exam score in 2012 (64.51 %) approached the score reported for some years with PLTL but overall, the average reported over several years with PLTL was significantly different to that without PLTL.

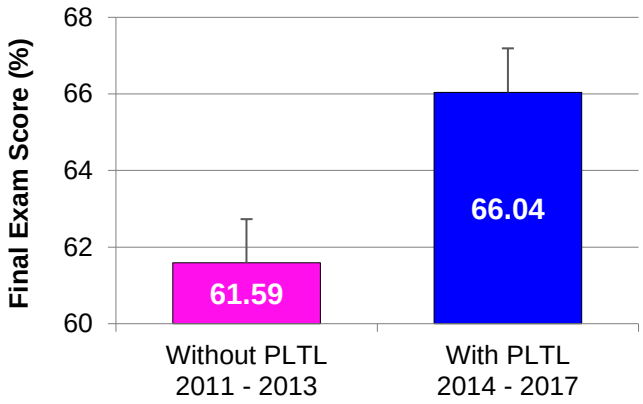
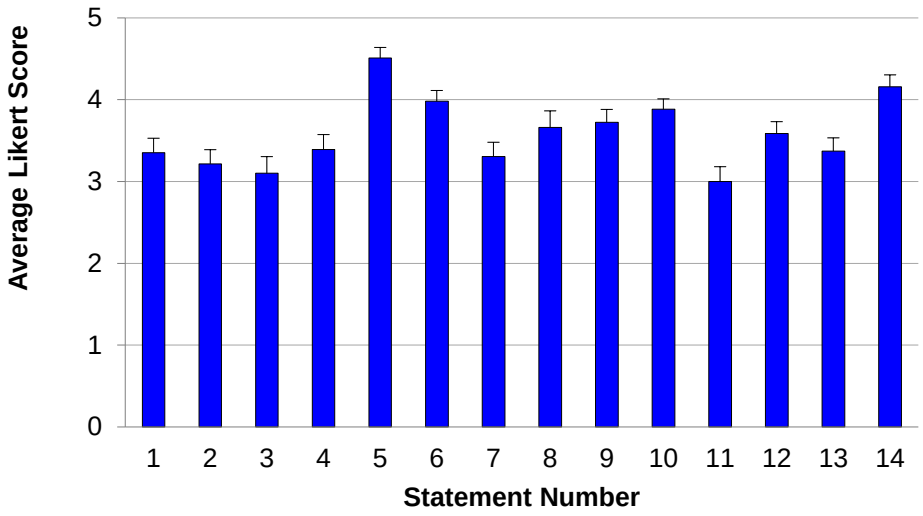


Figure 1. Comparison of General Chemistry II Final Exam scores (± SEM) analyzed over three years without PLTL (2011-2013; n = 266 students) and with PLTL (2014 – 2017; n = 230 students). Error indicates ± SEM; $p = 0.006$.

Student Response to PLTL

Following PLTL implementation in 2014, the students were surveyed and asked to rate 14 statements according to a Likert scale (5 = strongly agree; 4 = agree; 3 = neutral; 2 = disagree; 1 = strongly disagree). The average responses (51/64 respondents; 80% response rate) are given in Figure 2. Interestingly, despite indicating a neutral response regarding the effect of PLTL Discussion Groups on their final exam score (Statement 11, Figure 2), the average final exam score in 2014 was higher than the average from the previous year. Furthermore, the majority of students found taking part in the weekly Discussion Groups valuable, asked questions when they did not in class, participated willingly and viewed the Peer Leaders to be knowledgeable.



Statements:

1. I found the weekly PLTL Discussion Groups valuable.
2. I learned a lot.
3. I enjoyed the weekly PLTL Discussion Groups.
4. I asked questions that I didn't in class.
5. I completed the weekly PLTL-specific homework.
6. I understood the homework material.
7. I would prefer NOT to do homework.
8. If I did not understand the homework, it was discussed during the weekly PLTL meeting.
9. I understood the workshop material.
10. I willingly participated in the workshops.
11. Attending weekly PLTL Discussion Groups allowed me to perform better in the exams.
12. The PLTL-specific homework was the correct length.
13. The workshop material was the correct length.
14. The Peer Leader was knowledgeable.

Figure 2. Results from a survey conducted to assess student response to PLTL Discussion Groups (2014). 5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree (N = 51; 80% response rate; error bars = ±SEM).

Interestingly, if the scores of the same 14 statements are averaged per student, another trend can be seen to emerge. Those students who agreed with one statement tended to be fairly positive about other statements. In Figure 3, the average score of all the statements per student are represented. The data show that those students who had a positive experience tended to give high ratings (agree or strongly agree) to all the statements. Conversely, at the other extreme, 12-14% of the respondents viewed the PLTL program quite negatively. Since the survey was anonymous and took place at the end of the semester, there was no follow-up with these students. It was also not possible to correlate negative experiences with student performance in the course. Thus, a future goal will be to conduct further interviews, correlate experience with performance, and provide an intervention for those students not doing well.

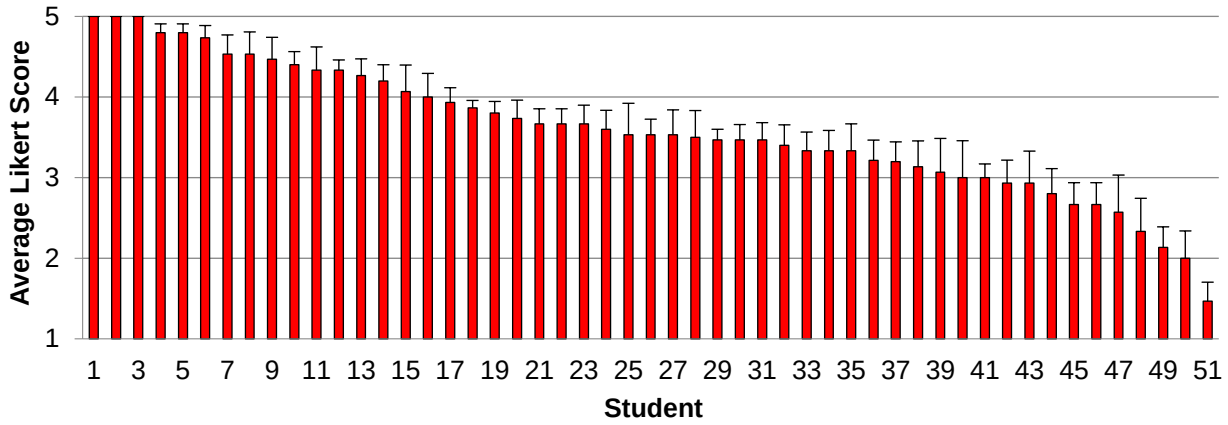


Figure 3. Results from a survey conducted to assess student response to Discussion Groups (2014). Average score of 14 statements per student. 5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree (N = 51; 80% response rate; error bars = ±SEM).

Student Evaluations of Peer Leaders

All courses are evaluated by the students at the end of the semester, and since the Discussion Groups are listed as a course in the Class Schedule website, students enrolled in Discussion Groups submitted evaluations of their Peer Leaders. A list of all the statements that students evaluated according to a Likert scale can be found in Appendix B. In Figure 4, the scores of all the statements for the collective groups of Peer Leaders are averaged and compared for 2014 and 2019. In 2014, all the results for all the statements gave an overall average value of 3.83, compared to an average of 4.40 in 2019. This significant increase in 2019 indicates that we are doing a better job training the Peer Leaders, and that the Peer

Leaders are generally viewed exceptionally positively by the students. A future goal would be to conduct more specific surveys of students evaluating their Peer Leaders and using the results to inform ways in which we can enhance our training of Peer Leaders. Excerpts of quotes from student evaluations of their Peer Leaders in 2014 and 2019 are indicated, and included in Appendix B.

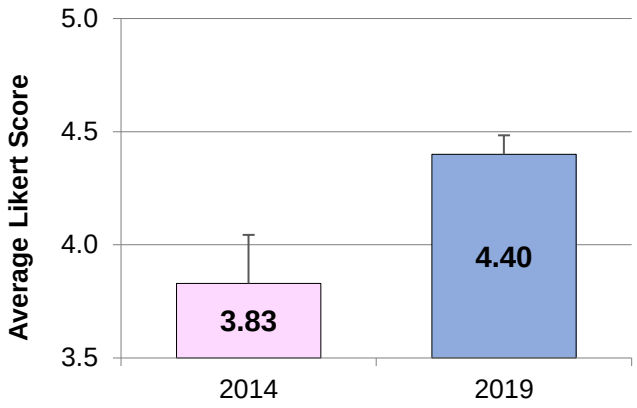
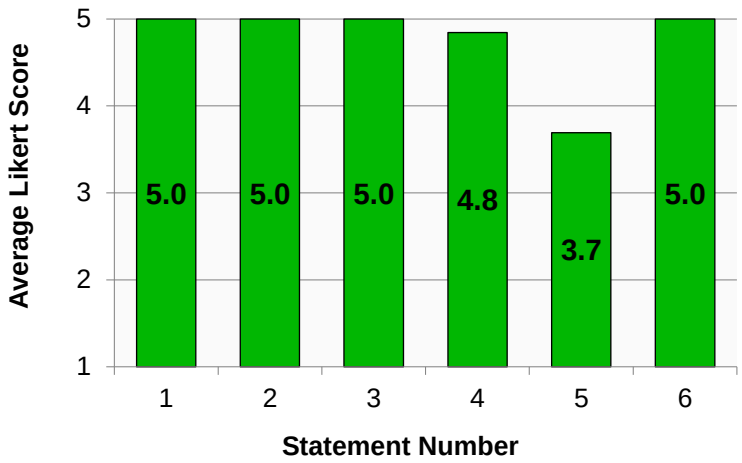


Figure 4. Evaluation of Peer Leaders by Students. Responses to 14 statements are averaged for the groups of Peer Leaders in 2014 vs. 2019. (8 Peer Leaders served in 2014, and 13 Peer Leaders served in 2019; Error = ± SEM; p = 0.03). The individual statements that the students rated according to a Likert score (5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree) can be found in Appendix B.

Peer Leader Responses to PLTL

Peer Leaders were surveyed and asked to rate six statements on a Likert-type scale. The results from a survey (2019) are shown in Figure 5. Several statements received a "5" (*i.e.*, strongly agree) rating, including strong agreement that leading Discussion Groups furthers their own understanding of Chemistry. However, statements 4 and 5 did not. Thus, some Peer Leaders encountered problems in adequately addressing some student behaviors (e.g., not paying attention, talking, being distracted by their smartphones), and/or encouraging some students to participate. Thus, a future goal would be to provide further training of Peer Leaders. Future surveys would further examine which aspects of Chemistry are better understood by the Peer Leaders once they serve as Peer Leaders and are re-introduced to the course material, as their answers will help to guide Instructors in how to structure better the lecture component of this course.



Statements:

1. Conducting the Discussion Groups has furthered my understanding of Chemistry.
2. Meeting on a weekly basis with the Instructor was helpful.
3. I believe that being a PLTL Peer Leader will help me with the Exit Exam taken in the senior year before graduation (ETS® Major Field Test).
4. I felt equipped to address any student behavior problems (*e.g.,* not paying attention, talking, being distracted by their smartphones) in my Discussion Group.
5. I was able to encourage students to participate in the workshop.
6. I believe that all Chemistry, Forensic Science or Biochemistry Majors would benefit from the experience of being a PLTL Peer Leader.

Figure 5. Results from a Peer Leader survey (2019). (N = 13; 100% response rate).

Comments from Peer Leaders

Peer Leaders were surveyed for their thoughts on the overall experience, and some examples of their comments are given below. Further comments and quotes are provided in Appendix C.

"It was a great experience."

"Very grateful for this opportunity."

"Discussion group is very beneficial to the students in learning Gen Chem and making friends / connections with other students and leaders."

"I love being a Peer Leader! I feel that it has made me a better person and student and I am so grateful for having this experience the past two years."

"This is a great idea that Pace has, and I would like to see it last."

> "The Discussion Groups for sciences are a VITAL part of the class. The students have the opportunity to ask questions in smaller groups w/o feeling intimidated. You can focus on main topics and help them learn. ABSOLUTELY NECESSARY."

Indeed, it has previously been found that assuming a Peer Leader role is among one of the most productive College learning experiences, increasing confidence in entering science-related careers, increasing interest in teaching and, in general, allowing the development of a greater effectiveness in interacting with people (Gafney & Varma-Nelson, 2007; Micari, 2006; Tenney & Houck, 2004).

Performance of Peer Leaders in Upper-Level Classes

The performance of Peer Leaders in an upper-level course (Advanced Inorganic Chemistry) was tracked, by examining overall scores of students with and without previous (or current) Peer Leader experience (Figure 6). It was found that of those students ***without*** previous Peer Leader experience, only 44% received a ≥ 90% score (*i.e.,* an "A" grade), whereas of those students ***with*** previous (or current) Peer Leader experience, 80% received a > 90%. Thus, students with Peer-Leader experience perform better in an upper-level Advanced Inorganic Chemistry course compared to students without prior experience.

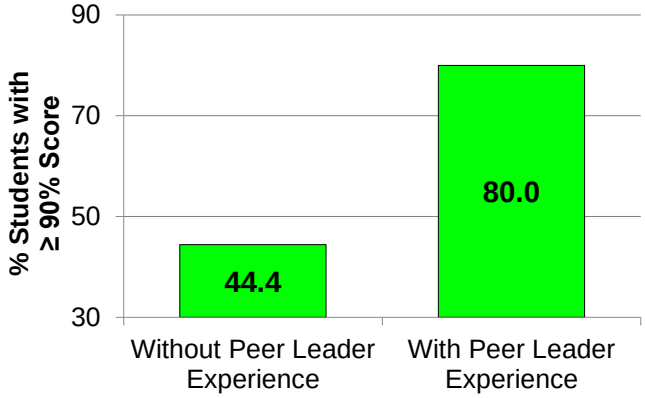


Figure 6. Percentage of students (without and with Peer Leader experience) who scored 90% and higher in an Advanced Inorganic Chemistry course. Data were collected over a 4-year period (n= 29, including 10 students with previous or current Peer Leader experience; 4 – 11 students were enrolled in the course per year).

Conclusions

Our studies demonstrated that implementation of PLTL led to, at most, a 10% increase in the students' Final Exam Score when comparing two separate years with and without PLTL. On averaging data over several years, a modest 4% increase in exam scores becomes apparent when comparing data over a 4-year period (2014 – 2017) with PLTL compared to that over a 3-year period (2011 – 2013) without PLTL Discussion Groups. Survey results in 2014 indicated that, on average, students agreed that they benefited from PLTL Discussion Groups, but a closer examination of the students' responses indicated a broad range of experiences, indicating that it may be beneficial to conduct further interviews, correlate experience with performance, compare scores between different majors, and provide an intervention for those students not doing well. Student Evaluations (University-based) of Peer Leaders indicated that students rated their Peer Leaders more highly in 2019 compared to 2014. Results from Peer Leader surveys indicated that the greatest problem that Peer Leaders encountered was in encouraging their students to participate in Discussion Groups, indicating that this is an area where Peer Leaders may benefit from further training. Students with Peer Leader experience were found to perform better in an upper-level Advanced Inorganic Chemistry course compared to students without prior experience, indicating that Peer Leaders greatly benefit from the Peer Leader experience.

Acknowledgments

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SUPPORTING INFORMATION

Appendix A. Student Response to PLTL

The questions in a survey administered to students to assess their response to the introduction of the PLTL Discussion groups (2014) are shown below. Results are shown in **Figure 2**.

1. I found the weekly PLTL Discussion Groups valuable.
2. I learned a lot.
3. I enjoyed PLTL Discussion Groups.
4. I asked questions that I didn't in class.
5. I completed the weekly PLTL-specific homework.
6. I understood the homework material.
7. I would prefer NOT to do homework.
8. If I did not understand the homework, it was discussed during the weekly PLTL meeting.
9. I understood the workshop material.
10. I willingly participated in the workshops.
11. Attending weekly PLTL Discussion Groups allowed me to perform better in the exams.
12. The PLTL-specific homework was the correct length.
13. The workshop material was the correct length.
14. The Peer Leader was knowledgeable.

Appendix B. Student Evaluations of Peer Leaders and Excerpts of Quotes from Students Evaluating their Peer Leaders

A. The questions in the end-of-semester evaluation of Peer Leaders by students are found below. Results are shown in **Figure 4**.

1. The objectives of this course were clear
2. The course has satisfied the objectives.
3. I would recommend this course to other students.
4. The Peer Leader was well prepared and organized.
5. The Peer Leader was a clear and effective communicator.
6. The Peer Leader was able to stimulate interest in the subject.
7. The Peer Leader encouraged questions, participation, and discussion.
8. The Peer Leader is knowledgeable in the subject area.
9. The Peer Leader made effective use of class time.
10. The Peer Leader was available to help other than during regular class hours and, if regular office hours were announced, was available during those hours.
11. The Peer Leader displayed respect for each student.
12. The Peer Leader made the course material understandable.
13. I would recommend this instructor to others.
14. The Peer Leader made effective use of other instructional material(s) and/or technology such as Blackboard.

B. Examples of Student Quotes from 2014

- "If I was stuck on something in class, I was able to ask questions during discussion and that helped."
- "It helped me reinforce my knowledge of chemistry and helped me understand material I didn't prior."
- "The peer group leader knew what she was doing, and she was able to link the logic of both qualitative and quantitative data together and express the overarching idea of the week's topic…"
- "Our peer leader was informative, helpful, and resourceful."
- "He was very kind and was willing to help when need be."

C. Examples of Student Quotes from 2019

- "Going through modules with us during [Discussion G] is helpful to understand more about our lecture content."

- "The homework assignments for this class were always reflected in the tests and helped us prepare for what was to come. As far as the peer leader that helped us for the course, she was great…"
- "I would recommend this group leader."
- "The discussion group leader was extremely knowledgeable on all the topics and was very good at explaining when there was confusion."
- "The weekly worksheets that were given to us in were always very useful and gave us fresh problems to practice…"
- "Having a peer leader made it a much more comfortable environment where I was not afraid to ask questions. I learned a lot of chemistry in this class which helped make up for what I was very confused about in lecture."
- "I liked that there was a student / teacher assistant that taught the discussion group because the student was knowledgeable, helpful, and relatable since she was the same age as us. That made the class a lot more open and relaxed in terms of the atmosphere and everyone was willing to participate and have fun reviewing topics."
- "I have no complaints about this course or the Peer Leader. Great experience!"
- "The [Peer Leader] made sure everyone participated which made it more hands on and easier to understand."
- "Discussion group had nothing wrong with it that made it not valuable. It was a very simple and straight forward class."
- "The homework helped us understand specific concepts which was nice because we wouldn't have otherwise."

Appendix C. Peer Leader Response to PLTL and Excerpts of Quotes from Peer Leaders Evaluating their Experience

A. The statements in a survey administered to Peer Leaders are found below. Results are shown in **Figure 5**.
   7. Conducting the Discussion Groups has furthered my understanding of Chemistry.
   8. Meeting on a weekly basis with the Instructor was helpful.
   9. I believe that being a PLTL Peer Leader will help me with the Exit Exam taken in the senior year before graduation (ETS® Major Field Test).
   10. I felt equipped to address any student behavior problems (*e.g.,* not paying attention, talking, being distracted by their smartphones) in my Discussion Group.

11. I was able to encourage students to participate in the workshop.
12. I believe that all Chemistry, Forensic Science or Biochemistry Majors would benefit from the experience of being a PLTL Peer Leader.

B. Examples of Peer Leader Comments and Quotes from 2019

Question 1: How do you think that you, personally, benefited from being a Peer Leader?

- Strengthened my knowledge of Gen Chem
- Helped me develop public speaking skills
- Gave me leadership skills
- Helped me relate to topics in other classes
- Helped me to learn from others
- "Teaching others is a passion. I love it"

Question 2: Do you think that the students benefit from PLTL Discussion Groups?

- "YES!"
- Reinforcing material
- Students are more relaxed because leaders are peers
- A large classroom is difficult (students may be too scared to ask questions)
- Helps them to critically think about lecture material
- Provides more time to enhance their understanding

Question 3: Anything else that you would like to mention concerning your experience?

- "It was a great experience"
- "Very grateful for this opportunity"
- "Discussion group is very beneficial to the students in learning Gen Chem and making friends/connections with other students and leaders"
- "I love being a peer leader! I feel that it has made me a better person and student and I am so grateful for having this experience the past two years"
- "This is a great idea that Pace has, and I would like to see it last"
- "The discussion groups for sciences are a VITAL part of the class. The students have the opportunity to ask questions in smaller groups w/o feeling intimidated. You can focus on main topics and help them learn. ABSOLUTELY NECESSARY"

Question 4: What did you find to be the most enjoyable aspect of being a Peer Leader?

- Interacting with students – mentoring them, satisfying to see them grasp material.
- Gave me an idea of what teaching might be like.
- Refreshing my memory.
- Connecting with my fellow discussion group leaders.

Question 5: What did you find to be the most challenging aspect of being a Peer Leader?

- Getting students to participate – shy students *vs.* those who don't want to… (mostly a problem at the beginning)
- Having to remember material
- Not my responsibility to teach
- Students in different sections learn topics at different rates, depending on the Instructor – the material being taught is not always aligned