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Peer-Led Team Learning: A General Chemistry Approach

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Abstract

Peer-led team learning (PLTL) has been implemented in General Chemistry at New York City College of Technology. The approach used in chemistry involves workshops consisting of problem sets developed by the Chemistry course instructor. These problem sets include textbook problems as well as practice examination questions. The effectiveness of peer-led team learning at New York City College of Technology entails that attendance is required, as opposed to encouraged at workshops. Comparative data prior to and after implementation of PLTL will demonstrate improvement in grades as well as understanding chemical concepts.

Introduction

Peer-led team learning (PLTL) workshops implementation in STEM disciplines, such as general chemistry, organic chemistry, biology and others, has resulted in an effective way to engage students with course material. Advantages of the PLTL model include improvement in student grades, retention, and better attitudes towards that discipline (Hockings et al, 2008).

During PLTL workshops, students work in teams to solve problems from a PLTL workbook or specific problems designed by the course instructor. A peer leader oversees this process and ensures that students engage in the workshop material. These workshops are designed to build students confidence with the lecture material and also provide a forum for peer-peer interaction outside of the lecture setting. The peer leader guides students through the process of problem solving by questioning.

New York City College of Technology (City Tech) is a large urban public institution, part of the City University of New York (CUNY) system. PLTL has a rich history in the City University of New York college system (Gosser et al, 2010). At City Tech, PLTL was supported by a NSF grant acquired in 1995-2005 by Victor Stozak. In addition, Pamela Brown was awarded an NSF Workshop Project Associate (WPA) grant to implement PLTL into Chemistry courses (1998-2005) (P. Brown, personal communication, 2012).

Methodology

Students enrolled in General Chemistry 1 (fall 2010) participated in PLTL workshops, which were held twice a week for one hour. Students however, were expected to attend and actively participate in only one of the workshop per week during whichever time best fit their schedule and availability. Peer leaders recorded attendance at each workshop. The course textbook and workshop materials were provided to peer leaders. Each workshop session consisted of problem solving in

teams. To analyze the effect of PLTL, fall 2009 was used since PLTL was not implemented during that semester.

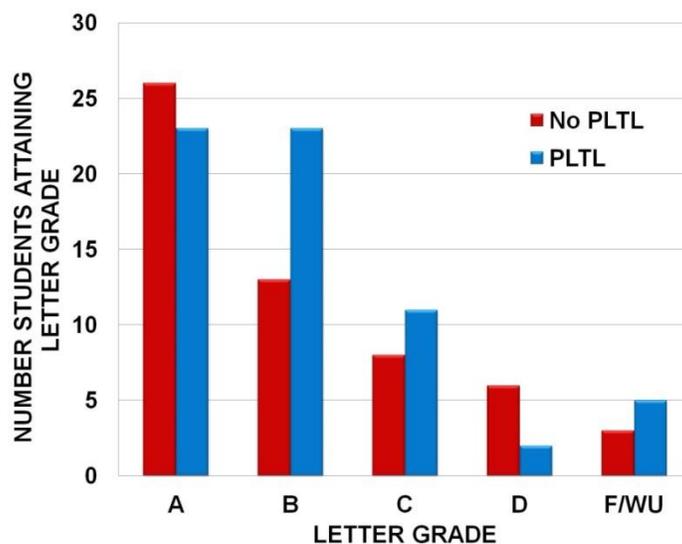


Figure 1. Grade distribution without and with Peer Led Team Learning workshops

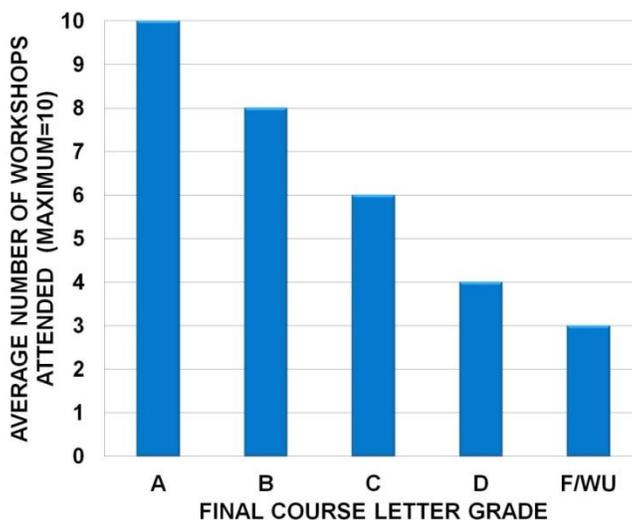


Figure 2. Mean number of workshops attended and grade distribution

Results and Discussion

The attrition rates in chemistry are analogous to national percentages (Tenney, et al, 2003). The effects of Peer Led Team Learning (PLTL) was observed and analyzed during fall 2009 (n=56) and fall 2010 (n=64) in General Chemistry 1 courses. Figure 1 shows that overall, students had better grade performance (A, B, C) when PLTL was used in the course. Students who withdrew (W) from

the course were not included in the data. A grade of F/WU indicates not passing the course or an unofficial withdrawal (student stopped attending the course but did not withdrawn officially or failure to attend the final examination). A grade of WU, by CUNY regulations, is equivalent to a grade of F. Figure 2 shows that student workshop participation and attendance positively correlates with higher course grades. Student attending six or more workshop attain grades of C and better.

The success of PLTL in chemistry is attributed to the following factors: (1) Attendance at workshops should be a requirement and should be integrated into the course (as a percentage of overall course grade) (2) Problem sets expanding on lecture concepts is sufficient (3) Communication of any form (during office hours or by email) between peerleader and course instructor is key. Furthermore, the use of “group work” in class (during lecture) demonstrates reinforcement of “PLTL model.”

Acknowledgments

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