

THE PEER-LED TEAM LEARNING INTERNATIONAL SOCIETY
PROCEEDINGS OF THE 2013 CONFERENCE
MAY 30-JUNE 1, 2013
UNIVERSITY OF HOUSTON-DOWNTOWN
HOUSTON, TEXAS

**WHY ATTENDANCE IS MANDATORY IN WORKSHOPS:
COMPARISON OF COURSE GRADES OF WORKSHOP ATTENDEES VS. NON-ATTENDEES
WITH SIMILAR GPA AND SAT SCORES.
PART II: RESULTS FOR SECOND-SEMESTER STUDENTS**

LUCILLE B. GARMON

Abstract: Many studies have compared course success of students who do and do not participate in PLTL workshops. These reports have been criticized when the students participating are self-selected. The students most consistently attending workshops, it is claimed, are those who are most motivated, mature, and capable of doing well anyway. To counter this objection, students regularly attending workshops in second-semester general chemistry were paired with occasional- and never-attendees with similar SAT scores and GPAs. Students not attending workshop regularly included those who simply chose to miss many sessions; those enrolled in an honors section, which did not include a workshop; and those taking the course online, for which workshops were not available. Students with similar GPA/SAT scores who attended workshop regularly averaged higher course grades than those who did not, even when matched with similarly prepared and motivated students such as those in honors sections.

PLTL at University of West Georgia

Workshops on the PLTL model have been an integral part of introductory chemistry courses at the University of West Georgia (UWG) for over a decade. In the 2013 spring semester workshops involved 585 students in nine sections of five different courses. This paper will discuss the impact of workshop attendance on course grades of participating students.

Focus of Study

Many studies have compared course success of students who do and do not participate in PLTL workshops. In pilot studies, sections with workshops can be compared with sections not offering workshops. But in other cases workshop attendance is voluntary and here results have been criticized because the students participating are self-selected. The students most consistently attending workshops, it is claimed, are those who are most motivated, mature, and capable of doing well anyway. Although workshop attendance is mandatory for the 585 students cited above, and counts as part of the course grade, some students are more diligent than others in

their attendance. Also there are some sections, specifically the honors and the online sections, for which workshops are not offered. Thus, low workshop attendees included all of the following.

- students in an honors section (no workshops scheduled)
- students taking general chemistry online (no workshops available)
- students who should have been attending workshop regularly but were not doing so, and whose absences may or may not have been excusable

To counter the objection that students regularly attending workshops are simply better students (better prepared, better motivated, better study habits, greater “native intelligence,” and in general more able) this study attempted to compare students attending workshop with students of similar ability who did not attend workshop. To quantify ability an “ability index,” determined from a combination of SAT scores and GPAs, was used in this study. The formula for the ability index was adapted from one used by the Admissions Office for entering freshmen. The Admissions Office formula is

Freshman Index = (500 X high-school GPA) +(combined SAT score)

An appropriate conversion is used when ACT scores are substituted for SAT scores.

This study used the college GPA instead of the high-school GPA for students past their first semester of college. The indexes ranged from above 3400 down to below 1800.

Having an “ability” measure independent of workshop attendance allowed students to be assigned to one of four groups:

1. more able with high workshop attendance
2. more able with low workshop attendance
3. less able with high workshop attendance
4. less able with low workshop attendance

Group 1 could then be compared to group 2 and group 3 to group 4, isolating the effect of workshop attendance from that of native ability and motivation. The overriding criterion in the comparisons was matching the average ability index.

At last year’s PLTLIS conference (Garmon, 2013), results were presented for first-semester general chemistry. Comparing the average course grade for each of the four groups, results were significant and consistent semester after semester: high-ability students who attended workshops regularly had the highest course grades, typically A- to B+ on average, followed by high-ability students with low or no attendance, whose typical average was B-. Low-ability students, who entered the course with lower SAT scores and marginal GPAs, but who attended workshop regularly were next, with a typical average of C+. Not surprisingly, the students with weak backgrounds who did not attend workshops had the lowest course grades, averaging C- to D. This last group also included the largest percentage of withdrawals.

The analysis for first-semester general-chemistry students has now been extended to students in second-semester general chemistry.

Methodology of Study

The analysis required three pieces of information for each student completing the general chemistry course: the grade earned, the student's ability index, and the number of workshop meetings attended during the semester. The grades were obtained from official university records. The SAT and GPA data needed to calculate the ability index were available separately, from a list of students registered for the course that included that information.

The third piece of information came from workshop records. Each week, each leader turned in a one-page report listing the students present along with their scores earned on preparation, attitude and participation and performance on a summary quiz. This information was entered on a spreadsheet that gave a running total of the number of workshops attended for every student registered for the course in any section that included a workshop.

For each section of second-semester general chemistry each semester, these three pieces of information were combined student by student. Grades were put on a numerical basis (A = 4, etc.) and W's eliminated from further consideration. Also eliminated were those for whom there were no known SAT or ACT scores, such as some international and non-traditional students. For these students the ability index could not be calculated.

Once a combined spreadsheet had been assembled with columns for the three key items (grade, number of workshop attended, and ability index), and the students with W's or missing information were removed, the remaining entries were sorted by attendance, from most to least number of workshops attended. About half of the entries, usually those missing zero, one or maybe two workshops, were labeled "high attendance" and everyone else was "low" (or at least lower) in attendance. The highs and lows were then separately sorted by the ability index. The four groups listed in the previous section were thus established.

In order to keep the average ability index close to the same for the low-attendance groups as for the high attendance group, not all students in the lower attendance group were included, only going down the rank of ability index until the average index matched that of the corresponding high attendance group. For example, in one semester the students in Group 1 (more able with high workshop attendance) attended an average of 14.4 workshop meetings during the semester while those in Group 2 (more able with low workshop attendance) attended an average of 8.6 workshop meetings. However, the average ability indexes of these two groups were 2826.8 and 2831.4, respectively – very close to the same value. Similarly, Group 3 (less able with high workshop attendance) attended an average of 14.4 workshop meetings while Group 4 (less able with low workshop attendance) averaged only 10.1 workshops. The average ability indexes were about six hundred points lower than those of Groups 1 and 2 but again, very close to each other: 2247.9 and 2247.5. Achieving a match in ability index was considered crucial to answering the question, "How does workshop attendance affect course grade when students of equal ability are compared?"

For the groups just mentioned the effect is definite: grade averages of 3.51 for Group 1 vs. 3.11 for Group 2 and 2.38 for Group 3 vs. 2.09 for Group 4.

Results

A series of analyzed results for first- and second-semester general chemistry has now been completed. Figure 1 shows the results for first-semester students in fall semesters 2003 to 2007 while Figure 2 shows the results for second-semester students in spring semesters 2004 to 2008, thus following each chemistry class through an entire academic year.

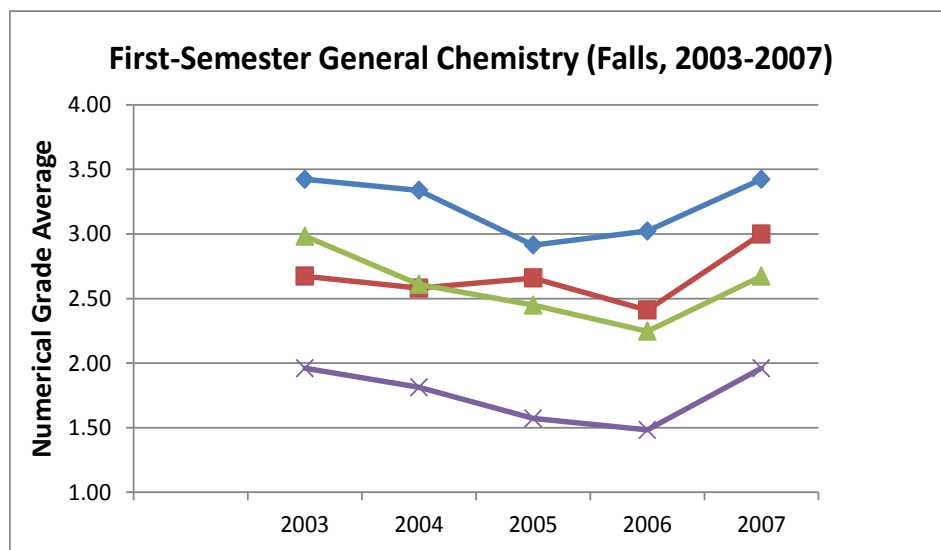


Figure 1. First-semester general chemistry for fall semesters, 2003-2007
N = 319 for Group 1, N=317 for Group 2, N=222 for Group 3, N=212 for Group 4

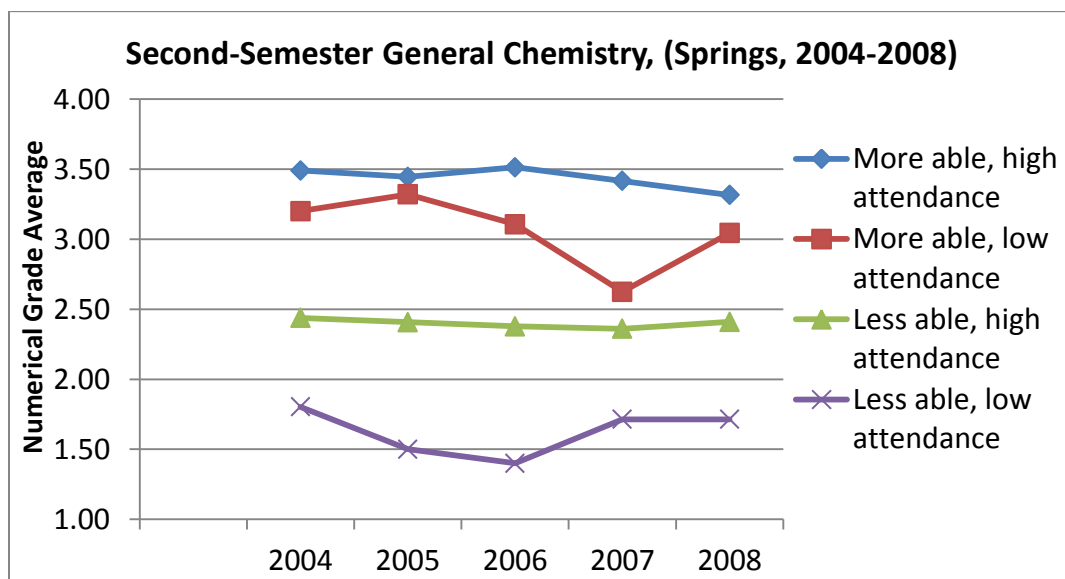


Figure 2. Second-semester general chemistry for spring semesters, 2004-2008
N = 240 for Group 1, N=208 for Group 2, N=246 for Group 3, N=292 for Group 4

Figures 3 and 4 bring the results up to date with first-semester student results for fall 2008 to 2012 and second-semester student results for spring 2009 to 2013, again following each chemistry class through an entire academic year.

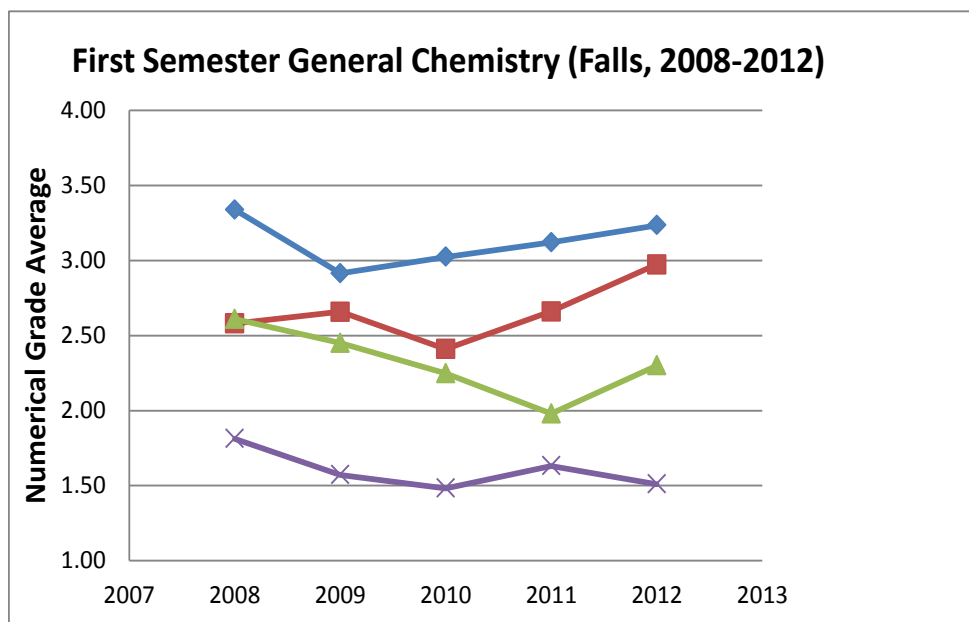


Figure 3. First-semester general chemistry for fall semesters, 2008-2012
 N = 420 for Group 1, N=294 for Group 2, N=404 for Group 3, N=287 for Group 4

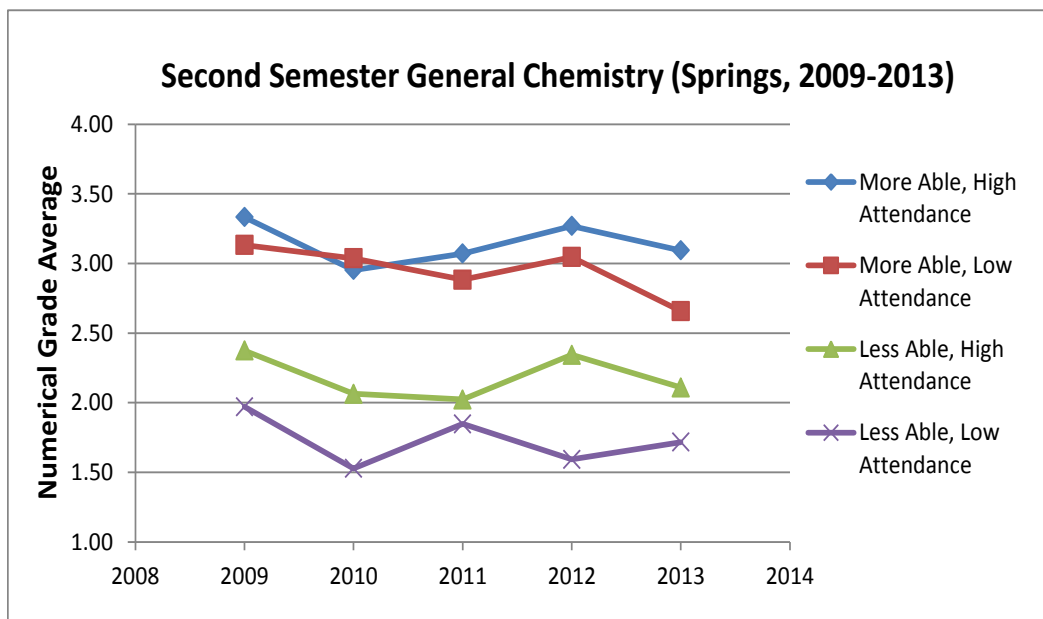


Figure 4. Second-semester general chemistry for spring semesters, 2009-2013
 N = 289 for Group 1, N=272 for Group 2, N=290 for Group 3, N=336 for Group 4

Conclusions

Although each group has variations from year to year, the more able with high attendance (Group 1, blue) are consistently above those of similar ability who do not attend workshop regularly (Group 2, red). (The one exception is the Spring of 2010, when the honors class was

exceptionally good.) Next down in grade average are the lower ability but high attendance (Group 3, green), who consistently do better in the course than those, again of similar ability, who do not attend (Group 4, purple). A conclusion from these results could also be that workshop attendance usually cannot make up for whatever goes into “ability” (background preparation, study habits, maturity, motivation, native intelligence) but that it sure helps.

Interestingly, an alternative treatment was also undertaken in which those “intermediate” in attendance were set aside so that those really low in attendance could be compared with those high in attendance. The results confirmed those given above.

Consistently, Group 1 was almost always above Group 2 and Group 3 was without exception significantly above Group 4. This supports the conclusion that attending workshop improves success in chemistry and that this is especially true for the less able students who are more likely to be struggling with the material.

Acknowledgments

National Science Foundation Grant 9950575 was the beginning of PLTL workshops in general chemistry. Colleagues among the Chemistry Department faculty have cooperated in the development of the PLTL model at UWG, especially Dr. Farooq Khan, who pushed for inclusion of PLTL in physical chemistry. Ms. Dusty Otwell has been an invaluable colleague in keeping PLTL going as well as assisting with many technical aspects of the program. Finally, thanks go to over 370 (and counting) students who have been peer leaders.

The oral presentation of this research was made by Brenton A. Bishop, Peer Leader, Department of Chemistry, University of West Georgia, Carrollton, GA at the Second Peer-Led Team Learning International Society Conference, held at the University of Houston-Downtown, Houston, Texas. Thank you, Brenton!

Reference

Garmon, L.B. (2013). Why attendance is mandatory in workshops: Comparison of course grades of workshop attendees vs. non-attendees with similar GPA and SAT scores. *Conference Proceedings of the Peer-Led Team Learning International Society*, May 17-19, 2012, New York City College of Technology of the City University of New York, www.pltlis.org; ISSN 2329-2113.

Cite this paper as: Garmon, L.B. (2014). Why Attendance is Mandatory in Workshops: Comparison of Course Grades of Workshop Attendees vs. Non-Attendees with Similar GPA and SAT Scores. Part II: Results for Second-Semester Students. *2013 Conference Proceedings of the Peer-Led Team Learning International Society*, May 30-June 1, 2013, University of Houston-Downtown, www.pltlis.org; ISSN 2329-2113.