

# COMPARISON OF EFFECTIVENESS OF SEVERAL PEER LEARNING PROGRAMS TO SUPPORT 1<sup>ST</sup> YEAR CHEMISTRY

Kim Taylor<sup>a</sup>, Tamsin Kelly<sup>b</sup>

Presenting Author: Kim Taylor ([kim.taylor@canberra.edu.au](mailto:kim.taylor@canberra.edu.au))

<sup>a</sup>Student Engagement, University of Canberra, Bruce ACT 2617, Australia

<sup>b</sup>Faculty of Education, Science, Technology and Maths, University of Canberra, Bruce ACT 2617, Australia

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## BACKGROUND

Many higher education institutions use peer learning programs for supplemental instruction, particularly in subjects such as chemistry (e.g. Gosser & Roth, 1998). Online peer learning programs have also been trialled, with mixed success (e.g. Beaumont *et al.*, 2012). At the University of Canberra, there is an established peer mentoring program consisting of weekly study sessions. In 2013 and 2014, several additional peer mentoring programs for chemistry were investigated, including interactive revision lectures, a helpdesk, rovers, and a trial of a synchronous online chemistry session. The relative effectiveness of each of these programs was compared, with a focus on the two programs that had the greatest student attendance.

## AIMS

This report provides a comparison of several peer learning programs designed to support first-year chemistry, in regards to both program attendance and to improvement in retention and success in the unit. This comparison could be useful for other institutions considering similar peer-learning approaches.

## DESCRIPTION OF INTERVENTION

In 2012 and 2013 (2014 data analysis awaiting final unit results), a consistent improvement in retention and success has been observed in student groups who attended chemistry peer mentoring sessions compared with groups who did not attend. Additional peer learning approaches were trialled in 2013 and 2014 to determine if further improvements could be made.

## DESIGN AND METHODS

The interactive revision lectures ran most weeks of semester and were staffed by one chemistry tutor and several roving peer mentors. The chemistry helpdesk, rovers and study sessions ran multiple times each week and were staffed by peer mentors. The online study session trial utilised *Blackboard Collaborate*. Attendance in the face-to-face peer mentoring programs was recorded using Opticon OPN-2001 portable barcode scanners. Unit enrolment and result lists were obtained from university records. The total cohort for the unit was grouped into attendees and non-attendees in the various peer learning programs. These groups were analysed against unit enrolment and results, in regards to student retention (proportion of withdrawn grades), success (proportion of P or higher grades in the retained students) and average final mark.

## RESULTS

Across the two chemistry units in 2013, the majority of student attendances were in the interactive revision lectures (n=1492 attendances) and in the weekly study sessions (n=717 attendances). Most students who attended weekly study sessions also attended the interactive lectures. Three student groups were compared: those who did not attend peer learning programs, those who only attended interactive lectures, and those who attended both the weekly study sessions and interactive lectures (Table 1).

The greatest improvement in retention and success was seen in groups who attended the weekly peer-led study sessions as well as the interactive lectures. The online chemistry peer learning trial had positive results; however there were limitations in the types of materials that could be used with the *Blackboard Collaborate* program, and a greater requirement for preparation and training.

**Table 1: Comparison of three student attendee groups in two peer learning programs for 1<sup>st</sup> and 2<sup>nd</sup> semester chemistry in 2013**

Unit	Peer learning program attendance and total student number	Average final mark	Retention rate	Successful unit completion rate
1 <sup>st</sup> semester chemistry (517 students total)	Attended interactive lectures and weekly study sessions (105 students)	66	94%	72%
	Attended interactive lectures only (173 students)	56	88%	50%
	Did not attend any peer learning program (239 students)	52	71%	49%
2 <sup>nd</sup> semester chemistry (273 students total)	Attended interactive lectures and weekly study sessions (57 students)	68	100%	91%
	Attended interactive lectures only (43 students)	62	100%	68%
	Did not attend any peer learning program (173 students)	54	86%	60%

## CONCLUSIONS

Of the programs analysed so far, the weekly face-to-face sessions have had the greatest impact on student success. Several of the other peer learning approaches have potential additional benefits, e.g. in catering for off-campus students in the case of online peer sessions, or in attaining greater attendance, albeit with smaller improvement in success, in the interactive lectures.

## REFERENCES

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