

## Background

Peer assisted learning (PAL) creates a collaborative learning environment where students learn from peer teachers, and peer teachers learn through instruction.<sup>1,2</sup> Compared to faculty instruction, published benefits of PAL include fostering an environment in which students feel comfortable discussing issues with peers,<sup>3</sup> presentation of material in a more comprehensible format,<sup>4</sup> and peer connections that increase students' enthusiasm of learning.<sup>5</sup> Taken as a whole, these outcomes may ultimately link to greater student self-efficacy. Student Taught Education in Pharmacy (STEP), a longitudinal PAL program, was implemented within the University of California San Francisco (UCSF) School of Pharmacy (SOP) in 2019 to facilitate longitudinal peer teaching within the new, organ-based, integrated curriculum. STEP teachers received five 2-hour training sessions on basic teaching principles and collaborated with faculty instructors to develop weekly review lessons for first-year pharmacy students.

## Objective

Understand the impact of longitudinal STEP attendance on first-year UCSF SOP students' self-efficacy.

## Methodology

### Study population

This was a prospective, observational, mixed-methods study of first year UCSF SOP students attending STEP sessions over two courses (Cardiovascular and Respiratory themes) between October 2019 and February 2020.

### Study design

Participants completed a survey before the start of the Cardiovascular theme and after the Respiratory theme to assess for changes in self-efficacy across three dimensions (knowledge, communication, and comfort) over time. We developed 15 Likert-type questions based on Bandura's self-efficacy theory and a free response question that asked participants how STEP impacted their learning experience.<sup>7</sup> Student attendance was self-reported during each STEP lesson.

### Analysis

Participants were divided into quartiles based on the number of STEP lessons attended. The relationship between STEP attendance and change in self-efficacy score was determined by mixed-effect linear regression modeling. The p-value for interaction between STEP attendance and change in self-efficacy across the study period was performed using Stata software. Two researchers independently coded the free response section into themes and then discussed together to come to a consensus on themes and subthemes of the qualitative data.

## Results

Table 1: Self-efficacy Score Differences Across Attendance Quartiles

Number of STEP Lessons Attended	0 – 1 (n = 12)	2 – 10 (n = 14)	11 – 25 (n = 8)	26+ (n = 7)	p-value
	Difference in Self-efficacy Score (mean ± sd)				
Knowledge	-0.50 ± 2.23	-0.93 ± 2.43	0.75 ± 0.71	0.86 ± 1.67	0.01
Communication	-0.50 ± 5.13	-0.93 ± 5.85	2.38 ± 4.14	2.14 ± 6.77	0.56
Comfort	1.25 ± 2.00	0.14 ± 3.51	0.38 ± 2.32	2.42 ± 5.06	0.26
Overall	0.25 ± 8.26	-1.71 ± 10.29	3.50 ± 5.45	5.43 ± 12.37	0.39

## Participant Quotes

"Participating in STEP has allowed me to appreciate the value of small peer facilitated group discussion and to also not be afraid to discuss various answers when often there are more than one solution to a problem."

"STEP has made me confident showcasing my knowledge (or lack of knowledge) to my peers, which has translated into being confident in the face of faculty or professionals, and being accepting that I may be wrong but it is okay since I am a student."

"My confidence after attending STEP sessions has allowed me to better think of ways to explain concepts to classmates, or how to better phrase and direct additional questions I may have for instructors."

"STEP continues to expose me to new ways of learning and understanding concepts. I am grateful to have a space to make mistakes in a constructive way. I am confident to participate in STEP and also comfortable being wrong since I know that we are in space to do so."

"STEP had provided a different perspective on the material. Sometimes that new perspective can open your eyes to the material that the lecture couldn't. I find this particularly in the small things I overlook. This makes me more confident in a professional setting because I am able to connect the dots more efficiently on medications, pathophysiology and pharmacokinetics."

## Acknowledgements

The authors of this poster would like to thank the STEP program mentor, Igor Mitrovic, MD. We would also like to extend our appreciation to the UCSF School of Pharmacy and the Mary Anne Koda-Kimble Seed Award for Innovation for funding the STEP program and this study. Many thanks to Jennifer La and Darra Drucker for continuing the STEP program in the 2020-2021 school year.

## References

1. Clarke B & Foltman W. Facilitating peer group teaching within nurse education. *Nurse Education Today*. 1990;10:54-57.
2. Walker-Burnick I, Rogers J & Koppelman M. A model for peer tutoring in the medical school setting. *Journal of Medical Education*. 1984;59:309-315.
3. Carr SE, Brand C, Wu T, et al. "Helping someone with a skill sharpens it in your own mind": a mixed method study exploring health professions students' experiences of Peer Assisted Learning (PAL). *BMC Med Educ*. 2016;16:48.
4. Santos J, Gonzalez L. Peer tutoring programs in health professions schools. *Am J Pharm Educ*. 2006;70(5): Article 70.
5. Jeffery MR. Evaluating enrichment program study groups: academic outcomes, psychological outcomes, and variables influencing retention. *Nurse Educ*. 2001;26:142-5.
6. Yu TC, Wilson NC, Singh PP, Lemana DP, Hawkins SJ, Hill AG. Medical students-as-teachers: a systematic review of peer-assisted teaching during medical school. *Adv Med Educ Pract*. 2012;12:157-172.
7. Bandura A. (1994) Self-efficacy. *Encyclopedia of Human Behavior*. 1994;4:1-81.

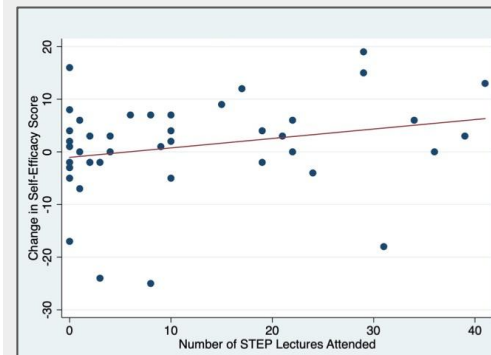


Figure 1. Change in Self-efficacy Score as a Function of STEP Attendance

## Discussion

- ❖ Although changes in self-efficacy for the communication and comfort dimensions were not statistically significant, we found a statistically significant interaction between the knowledge dimension of self-efficacy and STEP attendance (see Table 1).
- ❖ A small positive correlation was seen between the number of STEP lessons attended and change in self-efficacy score (see Figure 1).
- ❖ Participants comments demonstrated that STEP was successful in increasing self-perceived confidence in knowledge, communication, and comfort of learning.
- ❖ A perceived strength of the STEP program was the provision of a space in which first-year students felt comfortable to make mistakes, openly discuss problems, and learn among fellow peers.

## Future Directions

Further research will assess the effect of STEP attendance on longitudinal academic performance by analyzing students' exam data. Additional studies with larger numbers of participants are necessary to elicit the complete benefits of PAL.