

# Improving Student Learning in Introductory Psychology Courses with Peer Mentors and Supplemental Instruction

Saina Salamati, Valerie H. Nguyen, Noor Dalati, Ryan Cabagnet, Harin Lee,  
and Ruth Castillo

Department of Psychology, Irvine Valley College

## *Author Note*

Correspondence concerning this article should be addressed to Saina Salamati, Irvine Valley College, 5500 Irvine Center Drive, Irvine, CA 92618. Email: [ssalamati1@ivc.edu](mailto:ssalamati1@ivc.edu)

## *Suggested bibliographic reference*

Salamati, S., Nguyen, V., Dalati, N., Cabagnet, R., Lee, H., & Castillo, R. (2023). Improving student learning in introductory psychology courses with peer mentors and supplemental instruction. *Psi Beta Journal of Research*, 3(1), 61-67. <https://doi.org/10.54581/HPTE2032>

## **Abstract**

Research suggests that the presence of peer mentors in Introductory Psychology classes can improve student performance by raising course completion rates, promoting achievement of student learning outcomes (SLOs), and elevating overall grades (Asgari & Carter, 2016). Accordingly, Psi Beta student researchers brought honors psychology students into Introductory Psychology classrooms to serve as peer mentors. These mentors delivered three online lessons through Zoom, which covered scientific reasoning, biopsychology, and antidepressant therapy. The present study evaluated the effectiveness of these peer-presented lessons through a 64-item post-presentation assessment pertaining to Introductory Psychology. A total of 73 undergraduate psychology students from Irvine Valley College completed the assessment, with a control group of 64 participants and a treatment group of 9 students who participated in the supplemental Zoom lessons for extra credit. It was hypothesized that students who completed the supplemental lessons would score higher on the assessment than students who did not complete the supplemental lessons. A subset of hypotheses was posed that the treatment group would score higher on three individual SLO's compared to the control group. These SLO outcomes encompassed the following abilities: First, recall of various fundamental concepts presented in Introductory Psychology, second, the application of critical thinking to differentiate between psychological misconceptions and truth, and third, the ability to recognize different research designs, and formulate conclusions based on data. Results indicated no significant differences between the groups on the overall assessment nor the individual student learning outcomes. Limitations include group sizes, potential bias in the treatment group, and reduced impact of online learning compared to in-person instruction. Future research should compare the relative effectiveness of live in-person lesson delivery, live Zoom sessions, on-demand pre-recorded lectures. Results from this study can be used to further enhance psychology instruction and ensure that students comprehend course content while simultaneously providing growth opportunities for peer mentors.

*Keywords:* Peer-mentoring, community college, introductory psychology

Introductory psychology is a popular class often taken by students of all majors (Hard et al., 2019). Although many students are interested in the field of psychology, few are prepared to engage with their course content. First-year students often struggle to adjust to the new pace of college and may find the introductory course to be more challenging than they anticipate. It follows that these students are likely to lose focus with the class and the professor, resulting in low grades and class participation (Asgari & Carter, 2016).

Prior research indicates that peer mentoring can equip students with strategies to approach and learn new materials more effectively in the introductory course. For instance, a study by Asgari and Carter (2016) on introductory psychology students found that students who received peer mentoring had increased performance on exam grades compared to the first exam they completed without peer support, which especially benefited those who scored below the class average on the exam. Accordingly, peer mentors can be employed to help students implement more efficient study skills, and they may be selectively paired with students who receive low scores on an initial exam. Research has also shown that students who receive peer mentorship have better average grades and complete more courses successfully (Leidenfrost et al., 2014). Psychology students receiving peer mentorship at the University of Vienna for two years reported lower average grades, indicating higher academic performance based on the Austrian grading system. In addition, the mentee students passed more courses compared to non-mentees, reinforcing the notion that peer mentorship in psychology students is beneficial (Leidenfrost et al., 2014).

In addition, employed peer mentors tend to be closer in age to the students; A relatable, well-trained mentor can assist students with improving their academic performances, information retention, and application of knowledge both inside and outside of examinations (Pilot et al., 2021). Given that mentors are often closer to students in age, they can form close relationships with students and

make mentees feel more comfortable in seeking help. This enhanced accessibility can facilitate both comprehension of the material and overall performance in the course. Research shows that with the integration of peer mentors, students gain enhanced/increased knowledge about the academic setting they are in and the resources available to them (Alonso et al., 2010). Peer mentors with more experience in the academic setting can offer guidance and insight into available resources for students, which facilitates their education.

Expanding on previous research, this study aimed to assess the impact of peer mentoring on students that receive supplemental instruction from peers compared to students that do not receive peer support in PSYC 1, the introductory psychology course. Our hypotheses explored three Student Learning Outcomes (SLOs): SLO 1—the ability to recall concepts from PSYC 1; SLO 2—the ability to apply critical thinking skills to distinguish between psychological misconceptions and truths backed by research; and SLO 3—the ability to understand research design and draw conclusions from data when presented with figures. Our hypotheses were: (1) students who have completed the supplemental lessons will score higher on a questionnaire pertaining to PSYC 1 than students who did not complete the supplemental lessons, (2) the treatment group would score higher on SLO 1 compared to the control group, (3) the treatment group would score higher on SLO 2 when compared to the control group, and (4) the treatment group would score higher on SLO 3 when compared to the control group.

## **Method**

### **Participants**

Seventy-three undergraduate psychology students from a community college in Southern California completed an assessment administered by two faculty mentors in the fall of 2021. The assessment was adapted from pre-developed assessments designed for the Introductory Psychology course (Solomen et al., 2019; Halonen et al., 2020; Taylor & Kowalski, 2014; Stevens et al., 2016; Becker-

Blease et al., 2021). The control group included sixty-four participants recruited through Introductory Psychology courses and given course credit or extra credit as incentives. The control group participants were also recruited through the college's psychology honor society communication platform, Psi Beta Discord, many of whom demonstrated prior experience with psychology coursework. These students were not given an incentive to complete the assessment, and their participation was completely voluntary. The treatment group consisted of nine Introductory Psychology students. The students were recruited through the random selection of half of the students enrolled in ten Introductory Psychology courses. Upon the instructors' discretion, they were given the opportunity to participate in an online supplementary instruction program for extra credit.

### **Procedure**

The IRB application was initially submitted in 2021 and received an approval letter categorizing this research as exempt.

Faculty members leading this project were in charge of the peer mentor selection. The peer mentors were selected from honor students who were a part of Psi Beta chapter and who had expressed an interest in participating in an applied research study. These students were provided with instruction materials, relevant background readings, and scripts they could utilize for delivering the online lessons. The peer-mentors were able to ask any questions from the faculty mentor during meetings to ensure a thorough understanding of the lesson. The lessons consisted of PowerPoint presentations and educational videos covering topics including research design, biopsychology, and therapy. Each module had a specific focus on scientific research in psychology and covered basic research aspects such as correlation versus causation, spurious correlations, statistical reasoning, experimental research, double-blind design, independent variables, dependent variables, confounds, and placebos.

The treatment group was randomly selected from various sections of Introductory Psychology

by the faculty members, and the opportunity to participate was offered to equal-sized control and experimental groups. Students in the treatment group were given the opportunity to complete three online lessons delivered by peer mentors and, upon completion, complete an assessment. Upon reaching full completion, participants were offered extra credit. All participants were verified to be 18 or older and had to complete an informed consent notifying them of their rights as participants. Identifying information was collected only for the purpose of assigning extra credit and was promptly removed from the data file. Original data files were stored on one password-protected device that belongs to one of the faculty mentors on this project. Access to this information was restricted to the faculty mentor in charge, and all data was deleted upon project completion. Students were contacted via email by one of the lead faculty members, which included handouts needed for the lesson and the Zoom link. Throughout the lessons, professors were not in attendance, and the lessons were delivered solely by peer mentors. To allow for collaborative discussions, students were placed into breakout groups to work on handouts together. The peer mentors checked in with the students in the breakout room to clarify topics and answer questions. The students had the opportunity to share their answers to questions on the lesson handout with the group, and the peer-mentors could correct any incorrect responses and provide further explanation. Students who attended all three lessons in their entirety and completed the attendance form were asked to complete an online assessment.

### **Assessments and Measures**

Upon completion of the three lessons, the treatment group was administered a 64-item questionnaire, which was also given to the control group. The first 30 items captured SLO 1, the ability to understand concepts from Introductory Psychology; these items were adapted from Solomen et al. (2019). This content extended from research methods to various facets of psychology, such as

memory and psychological disorders. The next 20 items encompassed SLO 2, the use of critical thinking skills learned in the course to distinguish psychological misconceptions from the knowledge that has been supported by research. These items were adapted from Halonen (2020), and Taylor and Kowalski (2014). An example of a myth statement is that “individuals commonly repress traumatic memories,” while one of the statements actually supported by research was “criminals rarely escape punishment by pleading insanity at the time of the crime.” The final 14 items assessed SLO 3, the students’ ability to identify the elements of a study and draw conclusions from data when presented with figures. These items were application questions that were selected from Stevens et al. (2016) and Becker-Blease et al. (2021). Based on a given scenario, students were asked to identify the independent and dependent variables of the study, as well as select the most reasonable conclusion about the data from various answer choices. Accordingly, to determine whether the Zoom meeting lessons were beneficial to students, the assessment scores of the treatment group were compared to the control group.

### Results

An independent samples T-test was conducted to test the hypothesis that students who completed the supplementary modules would score higher on a questionnaire on Introductory Psychology material than students in the control group. There was no significant difference found between the two groups in the overall assessment,  $t(71) = -0.905, p = .369$ . There was also no significant difference between the two groups for SLO 1,  $t(71) = -1.559, p = .123$ , no significant difference for SLO 2,  $t(71) = -0.874, p = .385$ , and no significant difference for SLO 3,  $t(71) = -.985, p = .328$ .

When comparing non-significant mean differences, the experimental group scored higher on the overall assessment ( $M = 25, SD = 12.49$ ) compared to the control group ( $M = 21.438, SD = 10.868$ ). For SLO 1, the treatment group scored higher ( $M = 13.333, SD = 7.263$ ) than the control group ( $M =$

$9.953, SD = 5.924$ ). For SLO 2, the experimental group also had a higher average ( $M = 7.889, SD = 3.983$ ) than the control group ( $M = 6.734, SD = 3.674$ ). However, the treatment group received lower scores on SLO 3 ( $M = 3.778, SD = 2.774$ ) than the control group ( $M = 4.75, SD = 2.772$ ). Each mean reflects the average number of questions each group answered correctly. See Table 1 in the Appendix for a summary of all SLO means and standard deviations organized by treatment and control group.

### Discussion

This study sought to investigate the effectiveness of peer mentorship for Introductory Psychology students through the implementation of online Zoom lessons presented by peer-mentors. This study’s hypotheses included the following: (1) students with access to the supplementary instructions would score higher in total on a questionnaire relating to Introductory Psychology compared to the students who did not receive the lessons, (2) the treatment group would score higher on SLO 1 questions, recalling concepts from Introductory Psychology compared to the control group, (3) the treatment group would score higher on SLO 2, using critical thinking skills facilitated by the Introductory Psychology course to distinguish between psychological myths and knowledge supported by research compared to the control group, and (4) the treatment group would score higher on SLO 3, identifying research design aspects and drawing conclusions based on provided data when compared to the control group. The results of the study did not support any of the four hypotheses.

The lack of significance in these findings indicates that online peer mentors may not be as helpful as we expected, or as effective as previous studies reported. According to Leidenfrost et al. (2014), there was a significant difference among students with peer mentors as compared to the ones without a peer mentor in the overall grade the students received after two years; the peer-mentees received lower average grades, demonstrating better performance. In addition, Pilot et al. (2021), found that

psychology students with peer mentors had higher grades than they did during a semester without peer mentor intervention. Together, these findings suggest that proactive interventions in the first semester of the first year can enhance important aspects of learning and increase success for undergraduate psychology students. Moreover, Leidenfrost et al. (2014) found significant results suggesting mentees passed more classes in a two-year period in comparison to non-mentees. However, contrary to research findings, our study did not find any significant differences between the treatment and control groups in the three SLOs.

Since we did not see a statistically significant difference in the treatment group scores in comparison to the control group, it could be that peer mentors in an online setting do not have as significant of an impact on the improvement of SLO scores. We also believe that our study did not find significant differences due to the small size of our treatment group. Although there was no significant difference between the two groups, there is merit to the finding that the treatment group had higher means for the overall assessment, as well as SLO 1 and SLO 2. This suggests that the modules potentially aided students' retention of psychological content and overall reasoning. The lower mean for SLO 3, research design, may have been due to survey fatigue. This SLO was the last set of questions and was also the most application based, so it may have been better to include these questions earlier in the assessment.

### **Limitations**

A prominent limitation of this study is that the group sizes were disproportionate, with the control group being far larger than the treatment group. Although the group means provide some insight about lesson effectiveness, the effectiveness of the Zoom lessons is questionable. Another notable limitation is that many of the participants in the treatment group who completed all three lessons may be highly driven students who already have good study habits, which may explain the higher means. Moreover, students whose cameras were turned off

during the sessions might not have paid attention to the lectures and completed the handouts. Additionally, the students were not required to turn in completed handouts for credit, which may have contributed to the insignificant differences between the treatment and the control groups. A final limitation to be considered is that remote learning may not have as strong an impact as in-person lessons due to its limited social engagement. In an online setting, students do not receive the same personal and intimate instruction that they typically would receive in person, and they have fewer opportunities to build relationships with mentors, which could restrict their learning.

### **Future Research**

To extend current findings, the differences between live and pre-recorded lessons should be examined by comparing alternative treatment groups consisting of a) live Zoom sessions, b) on-demand, pre-recorded lessons, and c) in-person lessons. Since this study does not account for the participant's initial level of psychological literacy, we suggest administering a pre-test to assess whether the lessons produced measurable improvements in their understanding. In a similar vein, we would like to give pre- and post-questionnaires to the student mentors to compare their confidence in their knowledge and their psychological literacy before and after their work as peer-mentors. Lastly, the delivery method, materials, and content administered in the lessons should continue to be refined through student participant feedback. When replicating this peer mentor model, the online assessment assigned after the completion of the three lessons should include a final section to receive feedback for improvements. Through constant modification and strife for improvement, peer mentors may grow their understanding of differing lesson delivery, and student success rates may increase.

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## Appendix

**Table 1**

*Group Means for Overall Assessment and Student Learning Outcomes (SLOs)*

Measures	Treatment Group		Control Group	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Overall Assessment	25.00	12.49	21.44	10.87
Student Learning Outcome 1	13.33	7.26	9.95	5.92
Student Learning Outcome 2	7.89	3.98	6.73	3.67
Student Learning Outcome 3	3.78	2.77	4.75	2.77

*Note.*  $N = 73$ .  $n = 9$  for the Treatment Group and  $n = 64$  for the Control Group.