

# Perceptions of Flipped Classroom Teaching Among California Pharmacy School Students

Jenny Nguyen, Brenna Dooley, Lilliana Nguyen, Sophia Ho, Brooklyn Valdez, Kimberly Ngo,  
Christina Mnatzaganian, PharmD, BCACP; Kathryn Hollenbach, PhD, MPH; Laura Hart, PharmD, MS, BCPS, BCGP

## Introduction

- “Flipped classrooms” are courses that require students to learn material outside of the classroom (via learning modules, readings, or pre-recorded lectures) and subsequently apply learning by working through problems, case studies, etc. during class time
- Pharmacy students have positive perceptions of flipped classrooms and reported improved problem solving and increased enthusiasm<sup>1,2</sup>
- Advantages of flipped classroom included flexibility of learning material and in-person knowledge application. Limitations were access to and comfortability with technology<sup>1,2</sup>
- Flipped classrooms have been effective in courses like pharmaceutical calculations and laboratory courses<sup>3-6</sup>
- The SARS-CoV-2 (COVID-19) pandemic forced colleges and universities to move their courses to remote learning
- Courses that changed to flipped classroom formats due to the pandemic have led to increased readiness and self-awareness for self-directed learning in nursing students and positive perceptions of the modality and performance in a graduate physiology course<sup>7,8</sup>
- It is unclear how the COVID-19 pandemic has impacted the learning and teaching styles in pharmacy education

## Objectives

**Primary objective:** to evaluate and compare learning style perceptions of California pharmacy students.

**Secondary objective:** to determine the impact of the COVID-19 pandemic on perceptions of learning styles among California pharmacy students.

## Methods

- Cross sectional study of California pharmacy school students that have experienced traditional and flipped classrooms
- Invited students to participate in study by emailing curriculum directors an interest form to be distributed to the student body from 14 California pharmacy schools
- Participants emailed with interview details
- Interviews were conducted anonymously using Zoom audio, recorded, and subsequently transcribed
- Interview included 9 questions related to the benefits and challenges of flipped classrooms in the pharmacy curriculum
- Dedoose qualitative software used for data analysis
- Created inductive coding scheme to identify the presence of patterns, relationships, and themes
- Data was subdivided into key phrases, assigned a code (e.g., word or phrase) to identify key patterns, and grouped by concepts to help generate a theory that addressed the research question

## Results

### Overall Key Findings From 16 Student Participants

- 94% currently have flipped classrooms at their pharmacy school
- Majority (63%) felt that having access to recorded lectures was an advantage to flipped classrooms
- Most (82%) felt that traditional settings had the advantage of allowing for communication with lecturer
- With respect to academic performance 5 students believed they performed better, 3 students believed they performed the same, and 5 students believed they performed worse in flipped classes (vs traditional classes)
- Preferred flipped classes: application-based classes, therapeutics, case-based classes
- Preferred traditional classes: introductory pharmacy classes (pharmacokinetics, biochemistry, biopharmaceutics)
- More students had positive perceptions of flipped classrooms after the COVID-19 pandemic (44%) than before (13%)

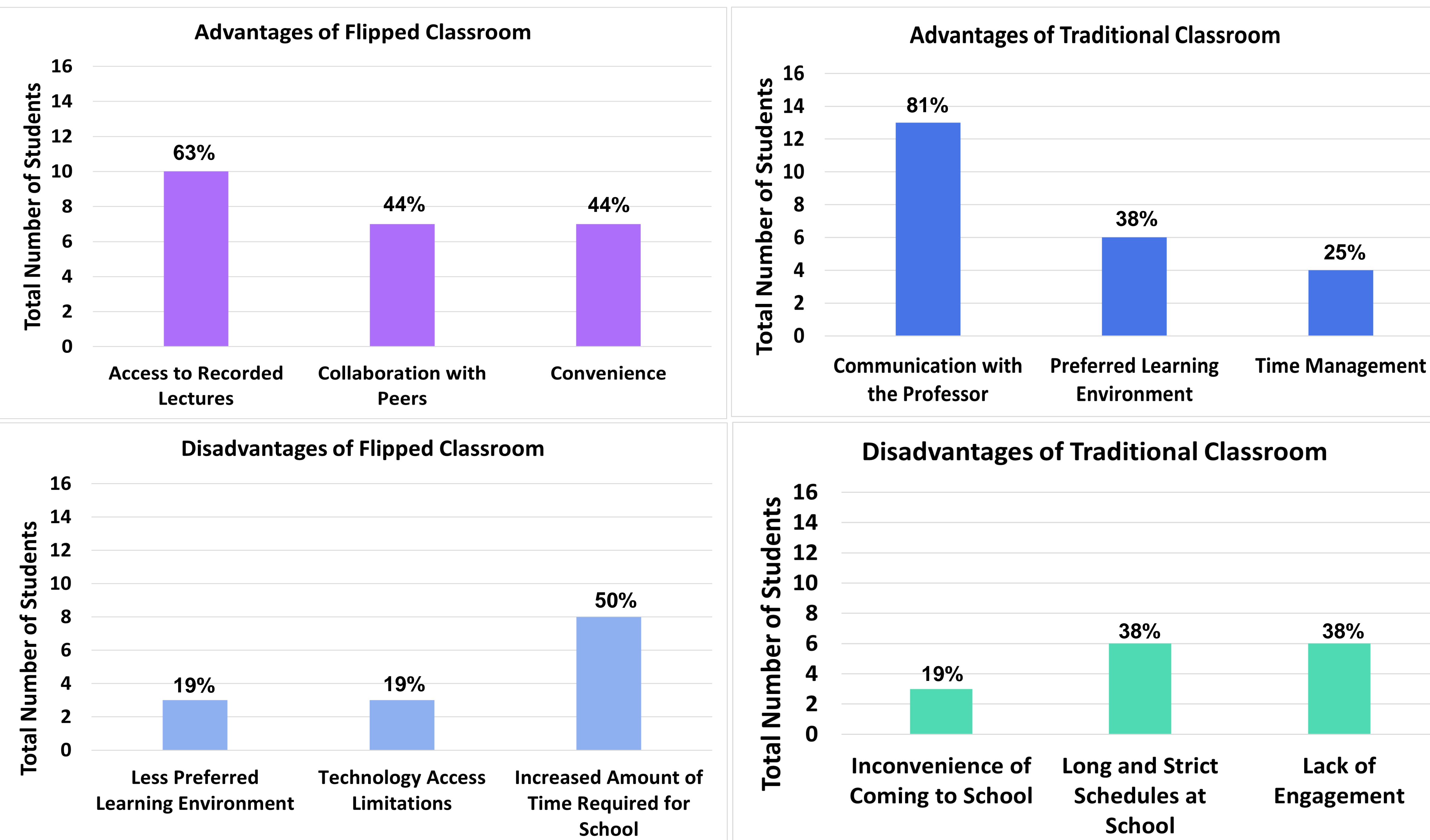


Figure 1. Occurrences of Various Themes of Perceptions of Flipped Classrooms Among Students.

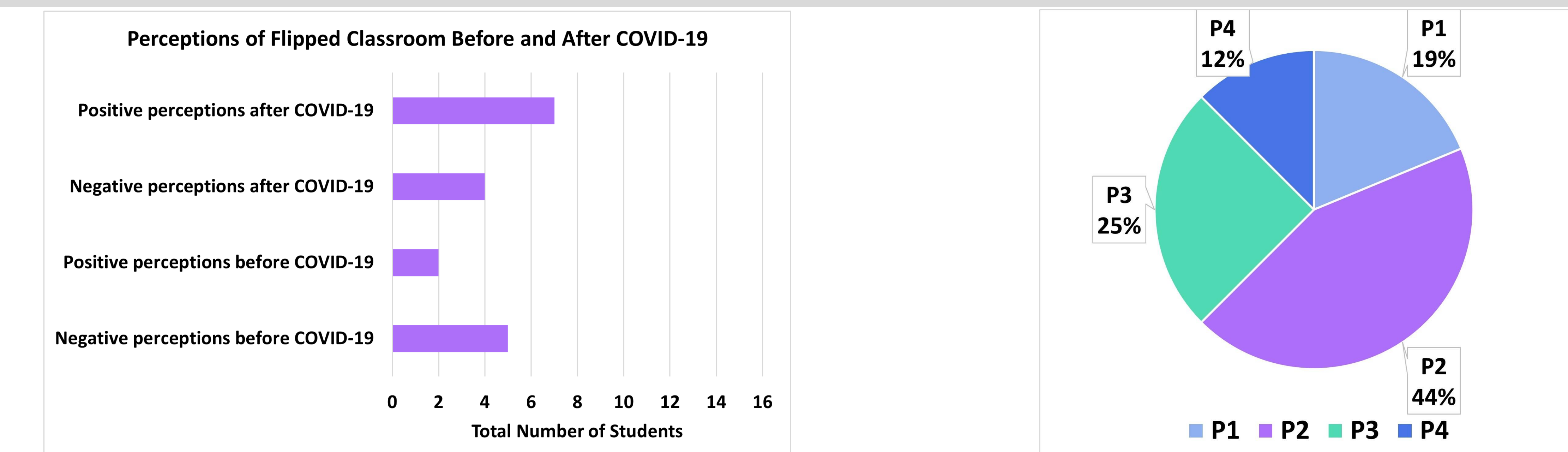
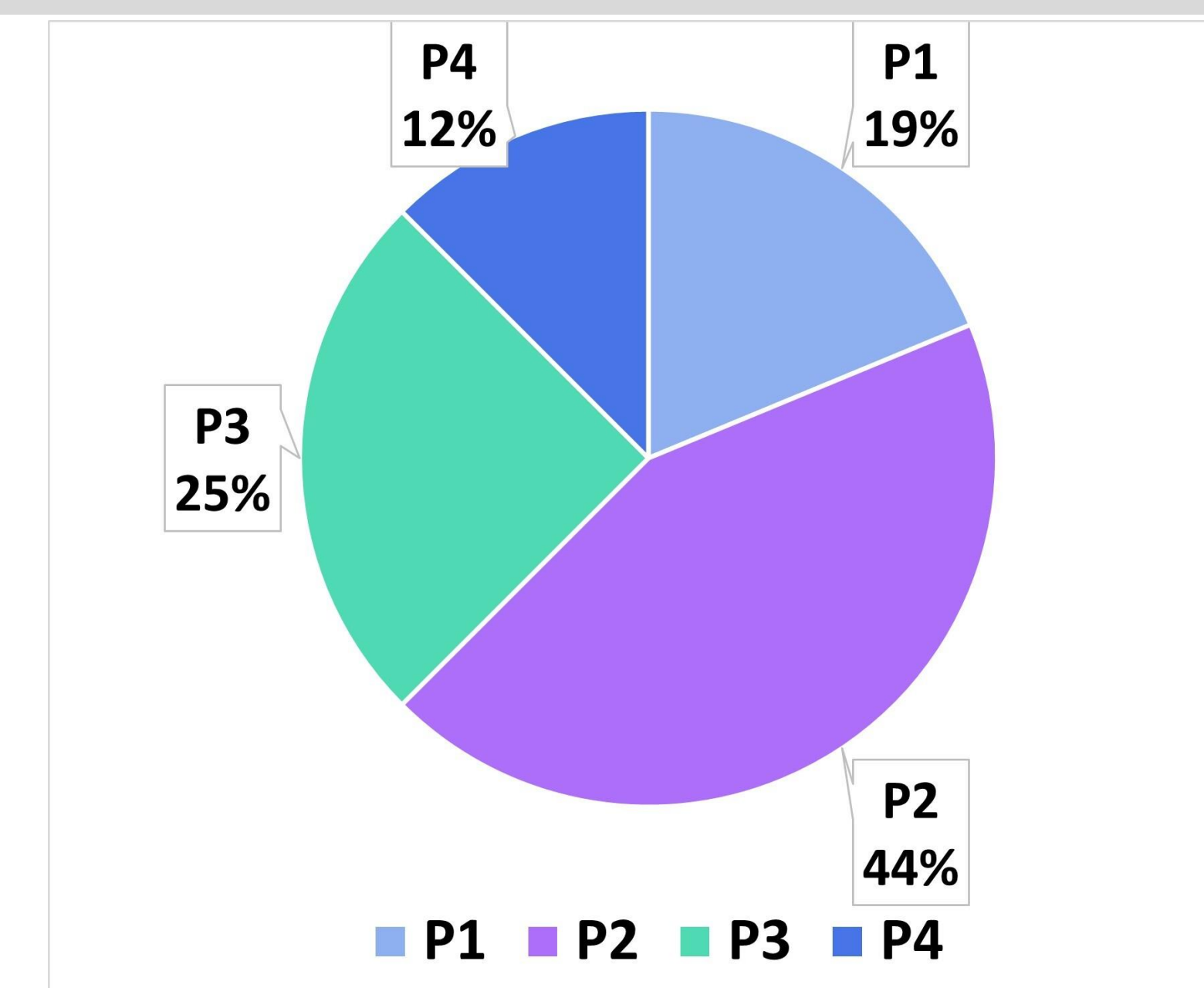


Figure 2. Occurrences of Various Themes Regarding Perceptions of Flipped Classrooms Before and After COVID-19 Among Students.

Figure 3. Distribution of Student Participants by Year in School.



## Discussion

- Flipped classrooms provide students flexibility in reviewing lectures but require adequate time management to maintain academic performance
- Students perceive that direct communication with professors is lost in the flipped classroom which may indicate a need for greater time to review concepts in flipped classroom environments
- Students felt more positively about flipped classroom after the COVID-19 pandemic

### Strengths:

- Addressed advantages and disadvantages of flipped and traditional classroom methodologies
- Adds to limited literature on COVID-19 impact on perceptions of flipped classrooms

### Limitations:

- Small sample size, uneven representation of schools and class years, and low response rate
- Only generalized to CA pharmacy schools
- Cannot be extrapolated equally to 3 vs 4-year programs

### Future Studies Should:

- Identify most effective teaching styles
- Determine specific pharmacy courses to benefit from each teaching style

## Conclusions

- Students perceived that access to recorded lectures was an advantage to flipped classrooms despite increased time required for school
- Students felt more positive about flipped classroom learning after the COVID-19 pandemic

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