



Supporting Students for Success in Math under AB 705: We Did It, and You Can Too

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Part 1: Data

In 2018-19, Foothill College fully implemented AB 705 for math. All students can directly enroll in two transfer-level courses:

**Precalculus +
Corequisite**

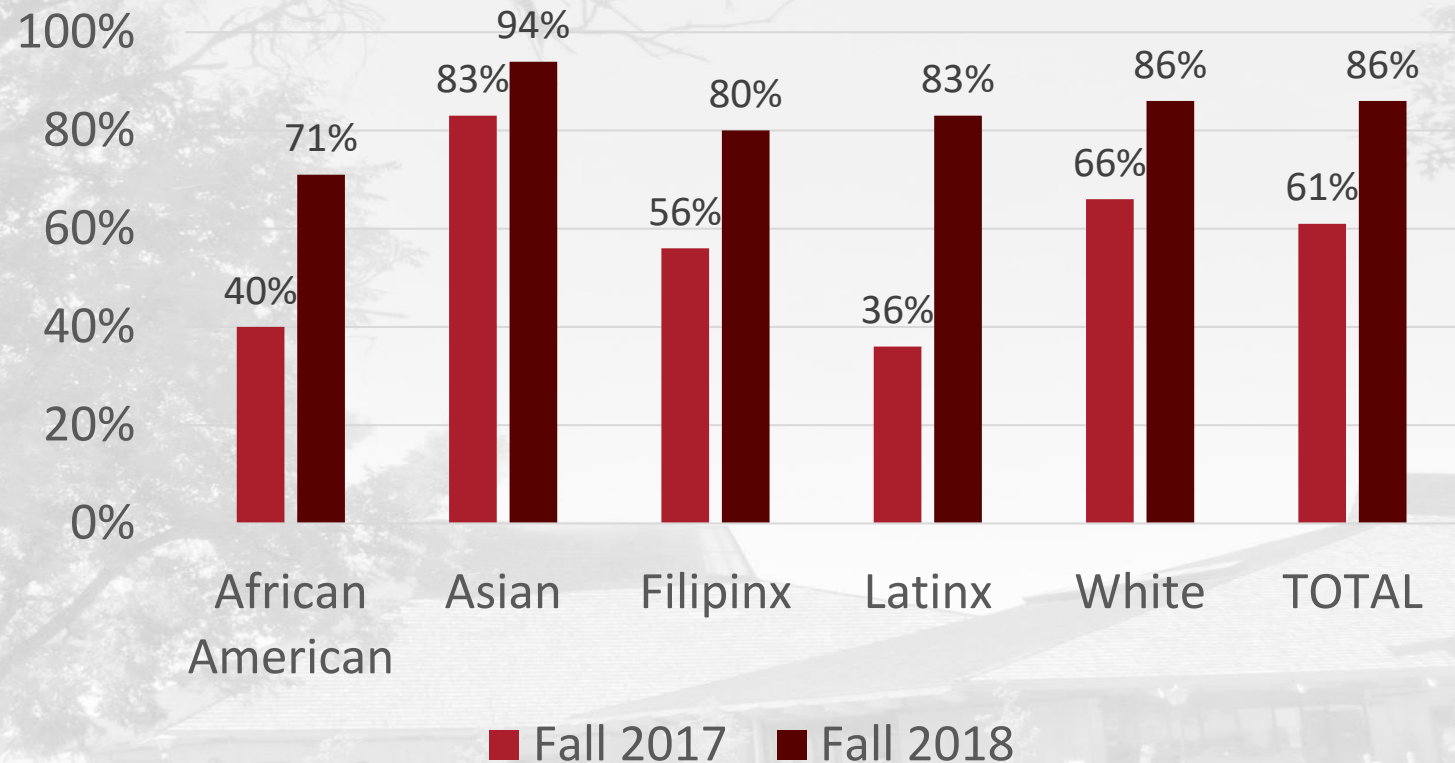
Added support:
corequisite

Statistics

Added support:
tutors (except online
sections)

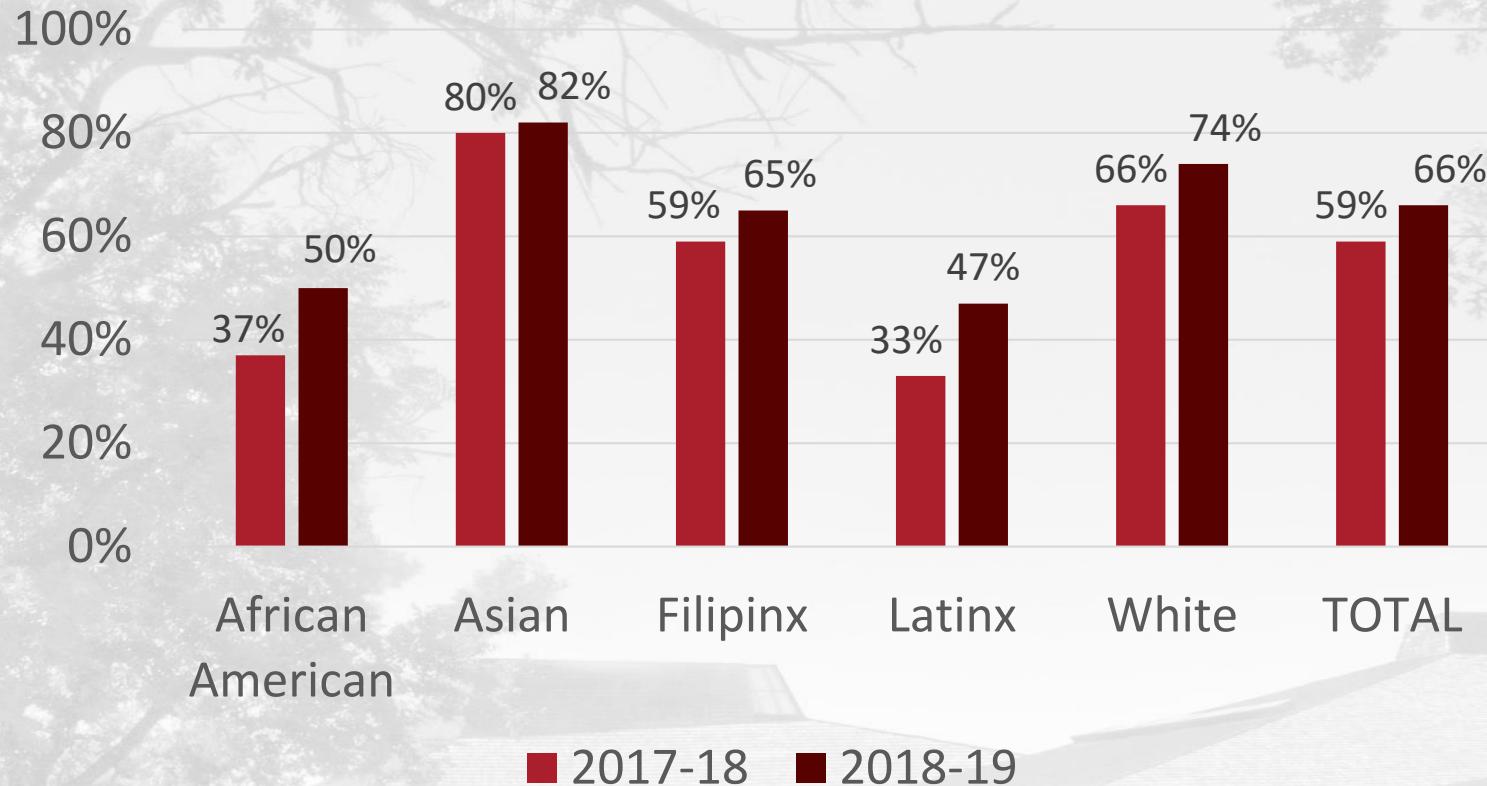
Increase in ACCESS:

% of Students Whose First Math Course at
Foothill was Transfer-Level
Fall 2017 vs. Fall 2018



Increase in THROUGHPUT:

Math % Achieved Throughput
2017-18 vs. 2018-19



Data: Out of all students who began the math sequence in Fall, the percent who successfully completed a transfer-level math course by Spring. Foothill College data only.

What about support?

- Did the corequisite in precalculus help students?

Precalculus
+ Coreq

vs.

Precalculus

- Did tutors in statistics help students?

Statistics +
Tutors

vs.

Statistics

- **Problem:**
 - Difference in HS GPA between groups
 - HS GPA is a strong predictor of course success

Approach:

- **Inverse propensity score weighting:** weights data so students from corequisite / tutor sections look **similar to** each other.

e.g.: “How would corequisite students have done if they had taken the stand-alone class?”

By weighting data:



Control for differences
between the groups, which
leads to:



Better causal inferences

Variables in inverse propensity score weighting:

- HS GPA
- Ethnicity (White or Asian vs. Not White or Asian)
- Gender (Male vs. Female)
- If the student was repeating the class (No vs. Yes)
- If the student had passed Algebra at Foothill (No vs. Yes)
- Course modality (face-to-face vs. hybrid) [Statistics only]

Precalculus analysis: Logistic regression using all variables as covariates (controls).

Results:

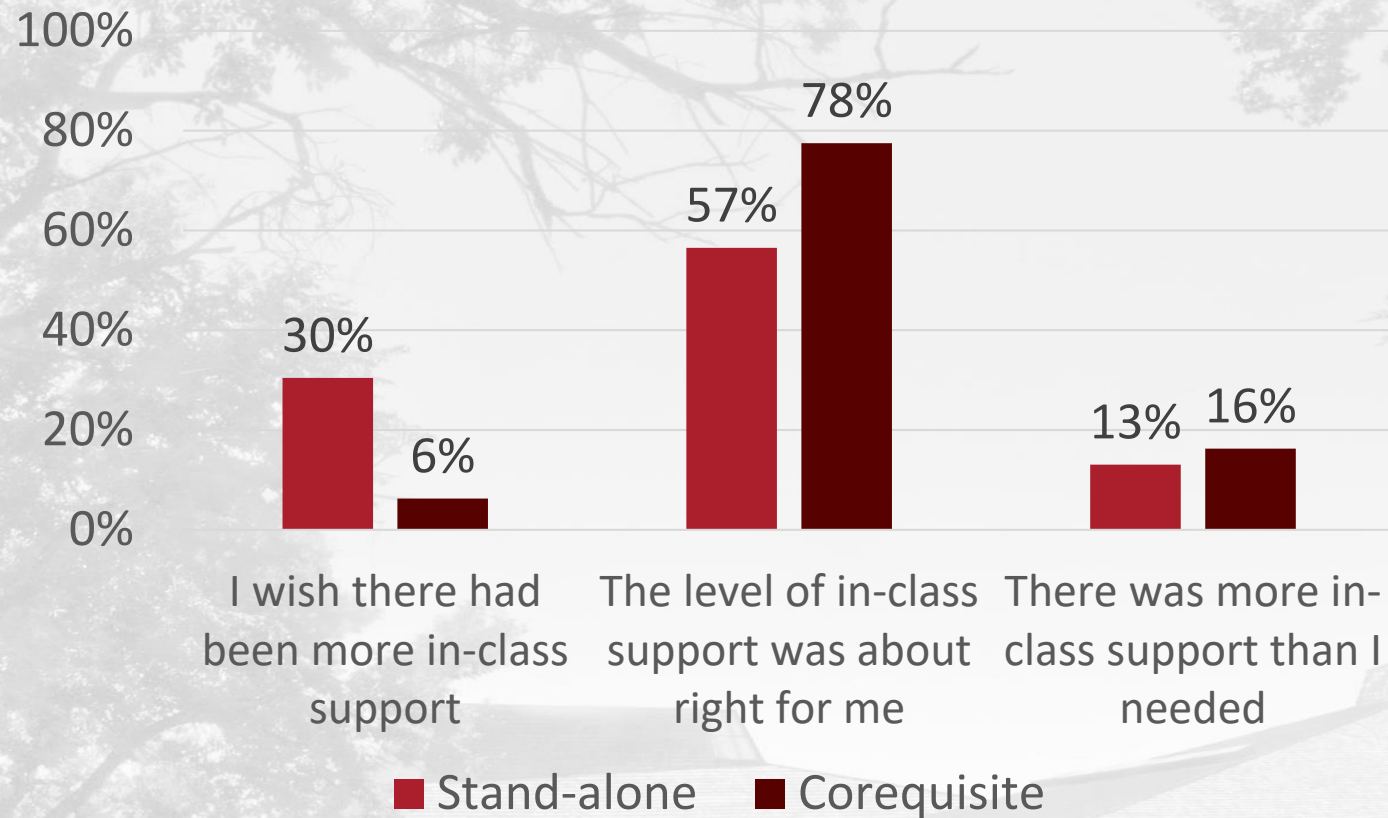
- The corequisite was a significant predictor of course success ($p < .05$)

Results for Precalculus: Fall 2017-Spring 2019

	Stand-alone	Corequisite
Unweighted data	59%	63%
Weighted data	53%	62%

Note: Data does not include summer sessions or special program sections (STEM Core).

Student Surveys: Level of Support Ratings by Stand-alone vs. Corequisite Section



Note: Almost all sections (both stand-alone and corequisite) had tutors; sections without tutors were excluded.

Statistics analysis: Logistic regression using all variables as covariates (controls).

Results:

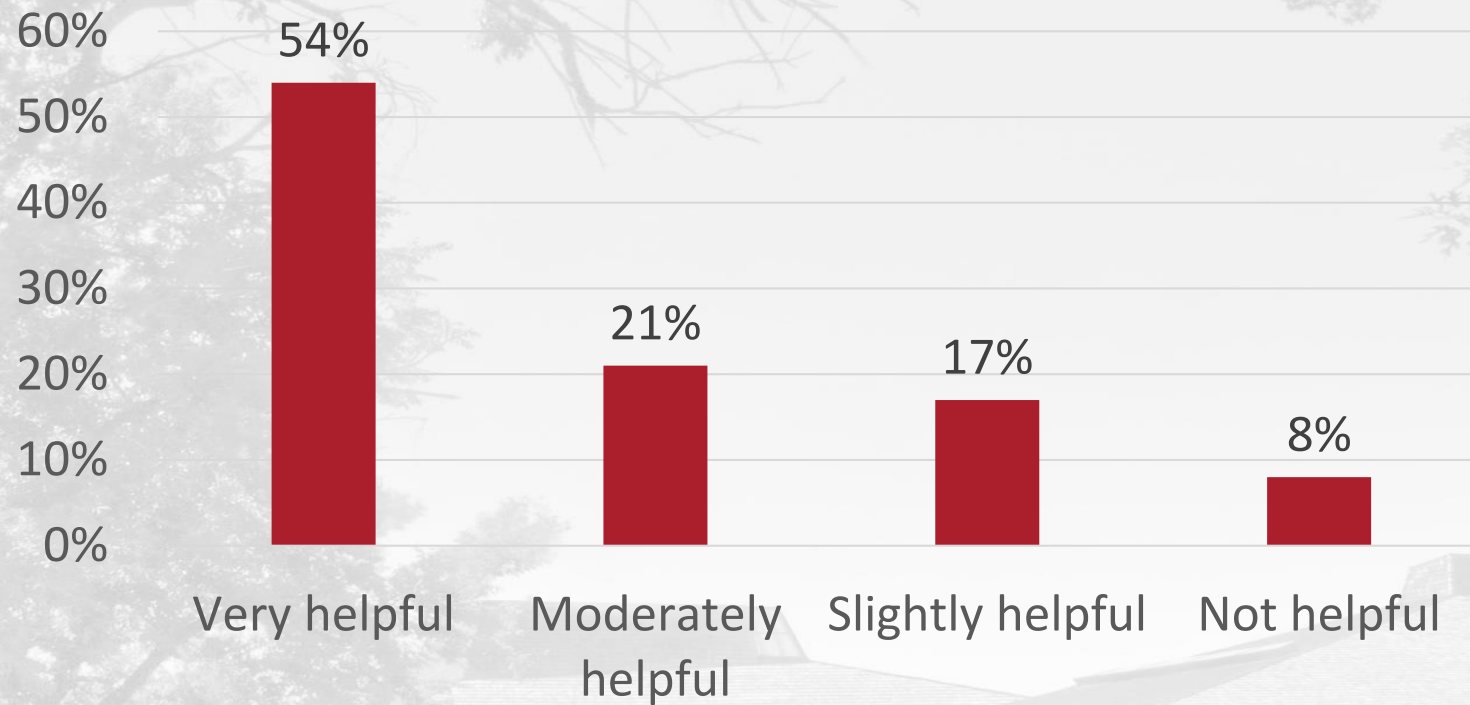
- Tutor support was a significant predictor of course success ($p < .05$)

Results for Statistics: Fall 2017-Spring 2019

	No Tutor	Tutor
Unweighted data	68%	65%
Weighted data	59%	64%

Note: Data does not include summer sessions, online sections or special program sections (Math Performance Success).

Student Surveys: "How Helpful was the Tutor to Your Success in the Course?"





Part 2: Precalculus Corequisite

Precalculus One Corequisite

- Cohort model, the same students and instructor are together for both the parent class and the corequisite.
- The parent class and corequisite are completely integrated in practice.
- Three 2.5 hour classes each week

Precalculus One Corequisite

- What support is offered with those extra units?
 - School/Study skills
 - Low stakes collaborative practice
 - Just-in-Time remediation

School/Study Skills

- Main Idea: Take the behaviors that you observe in successful students and turn them into assignments that are worth points and have due dates.
 - This gives students a more tangible reason to adopt these behaviors.
 - It gives you and them a way to monitor their progress and encourage changes to behavior as needed.

School/Study Skills Examples

- Wrap each of the quizzes with a before and after assignment.
 - Before: Students create a study guide where they reflect on and summarize what they have learned in each lesson.
 - After: Students do corrections on their quiz and reflect on each problem they got incorrect and their progress in the class in general.

School/Study Skills Examples

- Exam Corrections
 - Students meet with me or the embedded tutor to discuss their corrections.
- Students can earn an extra dropped quiz for spending 15 hours using the tutoring resources on campus.
- Students also start the quarter with a growth mindset activity.

School/Study Skills

- Why do we need the corequisite to do this?
 - Class time is used to introduce the assignment and explain why it is important.
 - Class time is given to the students to work on these assignments.
 - Instructor builds relationships with the students and encourage them to complete these assignments.
 - Instructor spend quite a bit of time outside of class checking and recording these assignments.

Collaborative Practice

- Main Idea: Give students just enough information to get started, then let them work out the details and pitfalls of particular problems in groups. If they need more help, the instructor can always bring the class together and explain more.

Collaborative Practice

- Benefits:
 - Students can help each other fill in any gaps in their knowledge.
 - Students leave with more experience solving problems.
 - Students are actively working, thinking and problem solving in class.

Collaborative Practice

Tips:

- Dedicate half of class time to collaborative practice.
- Expect a lower level of understanding when you end the introductory lesson.
- Assure students that if they are stuck someone will help them. It could be a classmate, the instructor or the embedded tutor.
- Keep the atmosphere light and playful. Say things like “Just see where you’re going to get stuck, that’s valuable information”.



Just-in-Time Remediation

- Teaching of “prerequisite” topics is best done in the context of the Precalculus lesson.

Just-in-Time Remediation

- Keep separate algebra and arithmetic lessons to an absolute minimum.
- Most of this will sort itself out during the collaborative practice.
- A short impromptu review can be done during a lesson or the collaborative practice if needed.

Notes

- In the corequisite sections that I taught the quiz scores were generally worse than in the regular sections, the exams were about the same, and the final exam scores were better. I use different versions of the same quizzes and exams I used when I taught the class without the corequisite
- The corequisite sections that I taught had wonderful positive classroom atmospheres. Students enjoyed working together and figuring things out with the support of the instructor, their classmates and the tutor.
- Student Quote: “Attending your lessons made me feel more confident in doing math because instead of making students feel guilty about the mistakes they made, you try and explain the best you can so we can understand our mistakes and do better the next time.”



Part 3: Statistics Embedded Peer Tutors

Structure of Embedded Tutoring

- Two quarter 1 credit training course.
- In-class assistance.
- Out-of-class workshops.

What did it look like?

- Attending classes and helping students.
- Hosting workshops outside of the classroom.
- Coordinating with professor:
 - Getting students to attend workshops.
 - Going over course content.

Workshops

- Content review and preparation.
- Developing study skills and habits.
- Test prep.
- Safe environment for students to ask questions of another student.

Challenges

- Scheduling, preparing, and running workshops.
- My own time management.
- Students reaching out outside of class and workshops.
- Paperwork and data collection.



Takeaways

- Strong understanding of class content.
- Professional development.
- Community building.
- Rewarding outcomes.

What would I change?

- Create the infrastructure first.
- Coordination between other tutors and instructors.
- Bolster tutor training classes.
- Instructor recommended tutors.

Part 4: SMALL GROUP DISCUSSION

- What is your institution doing to support students under AB 705?
- How is it going so far?
- Any other ideas for ways to support students?



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Thank you!