# Early Start Math - Designing an Accelerated Path to Close Achievement Gaps with ALEKS PPL

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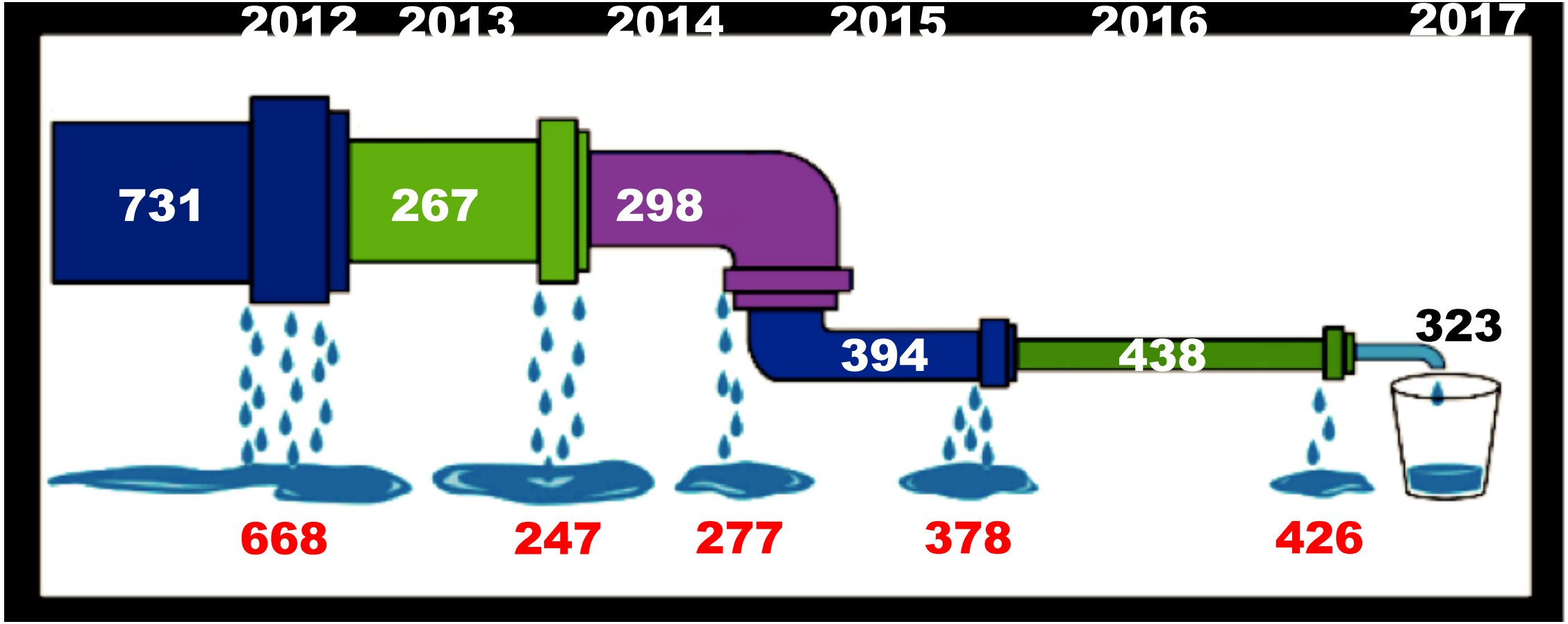
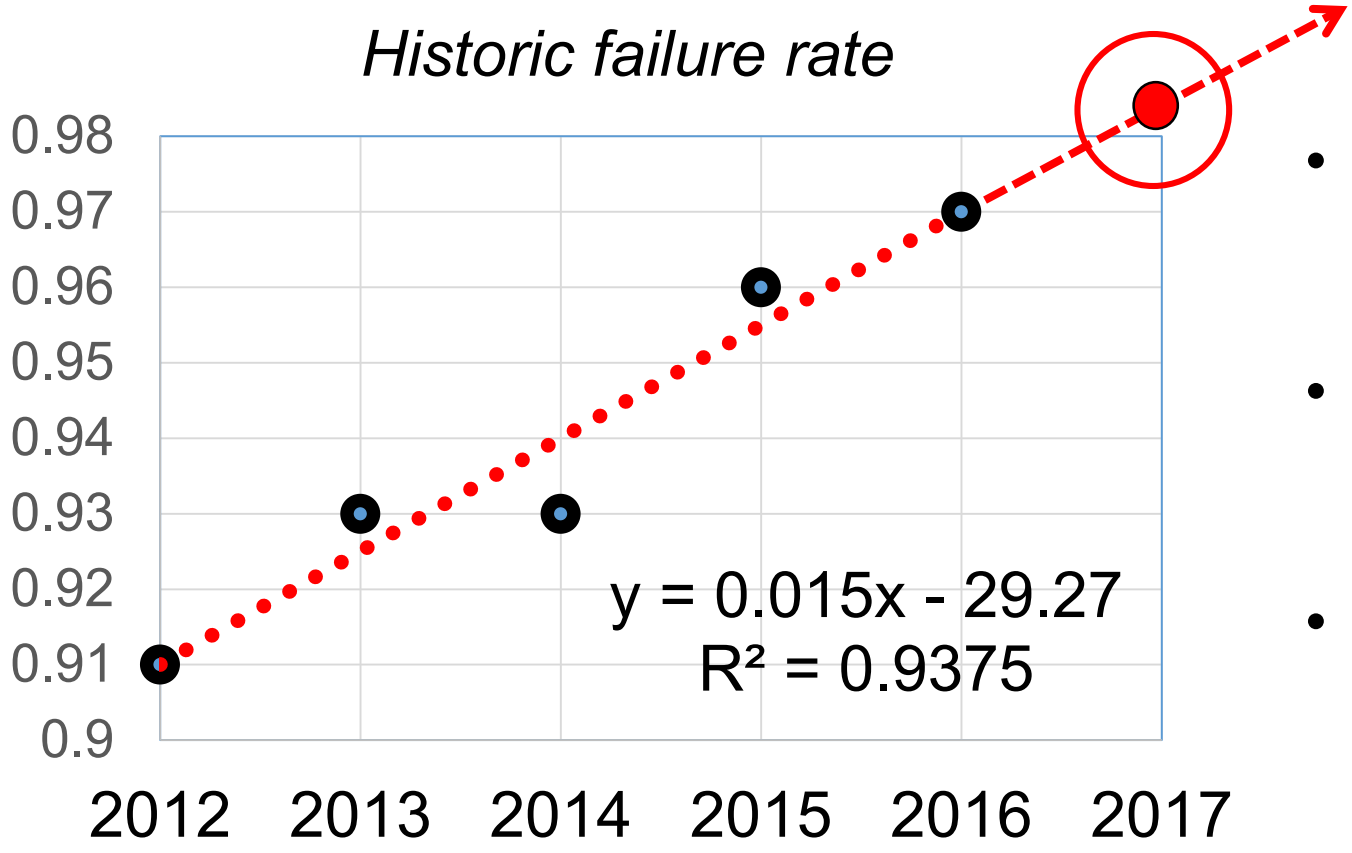
# ESM at CSULB

- Executive Order 1048 established the Early Start Program (ESP) in **2010**.
- Executive Order 665 required **all students to have achieved proficiency in English and/or Mathematics** by the end of their first year of enrollment at a CSU campus.
- As such, ESP was envisioned to jump start **academic preparation** of students who were **not yet prepared** for college-level work by their fall admission.
- ESM at CSULB was implemented in the summer of 2012.
- 1-unit and 3-unit ESM classes were offered during 2012-2016, both **lecture-based**.
  - 1-unit (15 hours): meets 3 hr/day for 1 week
  - 3-uint: meets 3 hr/day for 4 weeks
- In 2017, **ALEKS PPL** was implemented in all **1-unit** classes.
- In 2018, **ONLY 1-unit** ESM classes with ALEKS PPL were offered.

# A dire need for change



# The achievement gap otherwise remains wide w/o PPL




- On target to "lose" 98.5% of the 323 students enrolled (or **318**) in 2017.
- The introduction of PPL in 2017 led to a **success rate** of **64.4%** (vs. the 1.5% predicted).
- The **62.9** percentage point increase saved **203** CSULB students **at least one semester of developmental math**.

# The design of 1-unit ESM with PPL in 2017

## Course Outcomes

**CR:** advance to the next level

- **30 - 45:** dev math level 1 → dev math level 2
- **46 or higher:** dev math level 2 → GE math

**Advancing 2 levels were allowed**

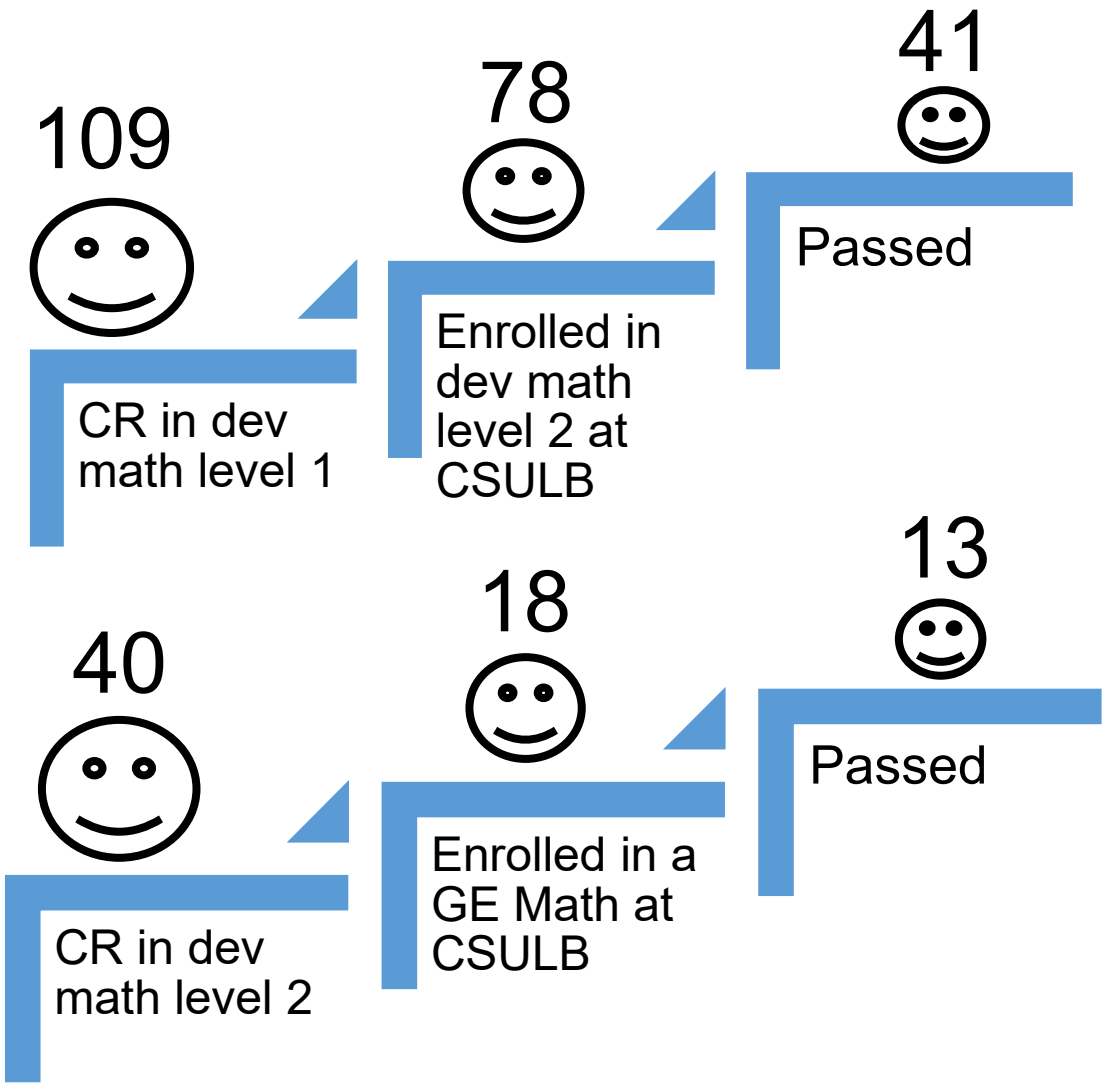
**RP**: satisfied the attendance requirement, do not advance to the next level

**NC**: did not complete CSU ESM requirement, fall admission is rescinded

- Instructor: GTA or lecturer
- Class format: an instructor & a tutor, 3h45m, once a week for 4 weeks, students work on their own, any proctored assessment outcome counts, early exit was possible
- Participation req: 5 hours of learning each week between classes
- PPL licenses were paid by CSULB

| | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---|---|---|---|---|---|---|---|
| Week 1 | 7/10 | 7/11 | 7/12 | 7/13 | 7/14 | 7/15 | 7/16 |
| | **Take the initial proctored assessment** | Work in ALEKS for a minimum of 5 hours between class meetings. | | | | | |
| | Visit the tutoring center for additional support | | | | | | |
| Week 2 | 7/17 | 7/18 | 7/19 | 7/20 | 7/21 | 7/22 | 7/23 |
| | **Continue working in ALEKS; take unproctored assessment for practice** | Work in ALEKS for a minimum of 5 hours between class meetings. | | | | | |
| | Visit the tutoring center for additional support | | | | | | |
| Week 3 | 7/24 | 7/25 | 7/26 | 7/27 | 7/28 | 7/29 | 7/30 |
| | **Continue working in ALEKS; take unproctored assessment for practice** | Work in ALEKS for a minimum of 5 hours between class meetings. | | | | | |
| | Visit the tutoring center for additional support | | | | | | |
| Week 4 | 7/31 | 8/1 | 8/2 | 8/3 | 8/4 | 8/5 | 8/6 |
| | **Take the final proctored assessment** | | | | | | |
| | Visit the tutoring center for additional support | | | | | | |

# Student success in subsequent math classes & accuracy of placement




**52.6%** Completion rate with PPL
vs.
**70%** Completion rate without PPL

**Inaccurate placement** with PPL cut score of **30** for dev math level 2

**BUT, dev math courses are GONE under EO 1110**

**72.2%** Completion rate with PPL
vs.
**75.11%** Completion rate without PPL

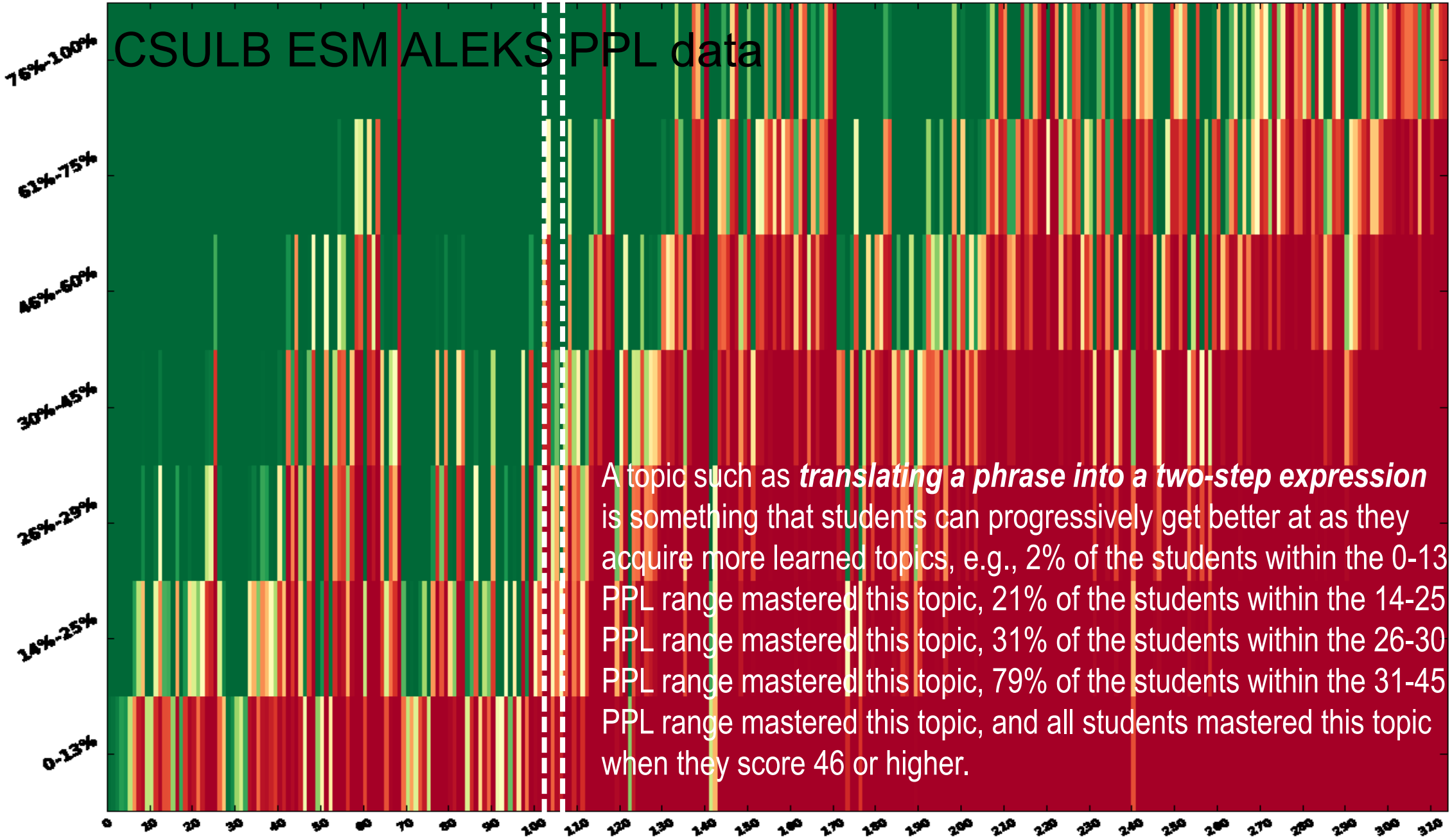
**Accurate placement** with PPL cut score of **46** for entry-level GE Math/QR courses

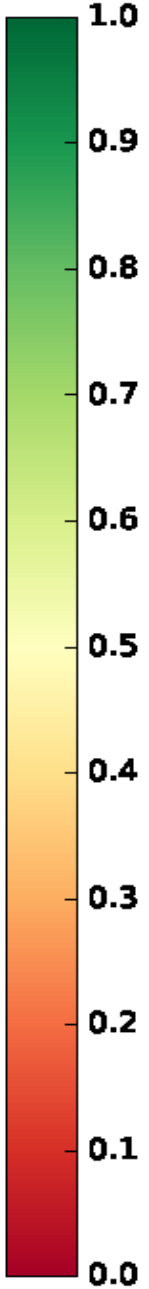
# Improving ESM by analyzing institutional PPL data

Issues with the 2017 design:

- Lack of human interactions and allowing for early exit prohibited students from being engaged with the campus community
- Without a closer look at students' PPL data, it was difficult for the instructors to intervene and design adequate curriculum

# CSULB ESM ALEKS PPL data




A topic such as ***translating a phrase into a two-step expression*** is something that students can progressively get better at as they acquire more learned topics, e.g., 2% of the students within the 0-13 PPL range mastered this topic, 21% of the students within the 14-25 PPL range mastered this topic, 31% of the students within the 26-30 PPL range mastered this topic, 79% of the students within the 31-45 PPL range mastered this topic, and all students mastered this topic when they score 46 or higher.

# The design of 1-unit ESM with PPL in 2018

## New in 2018

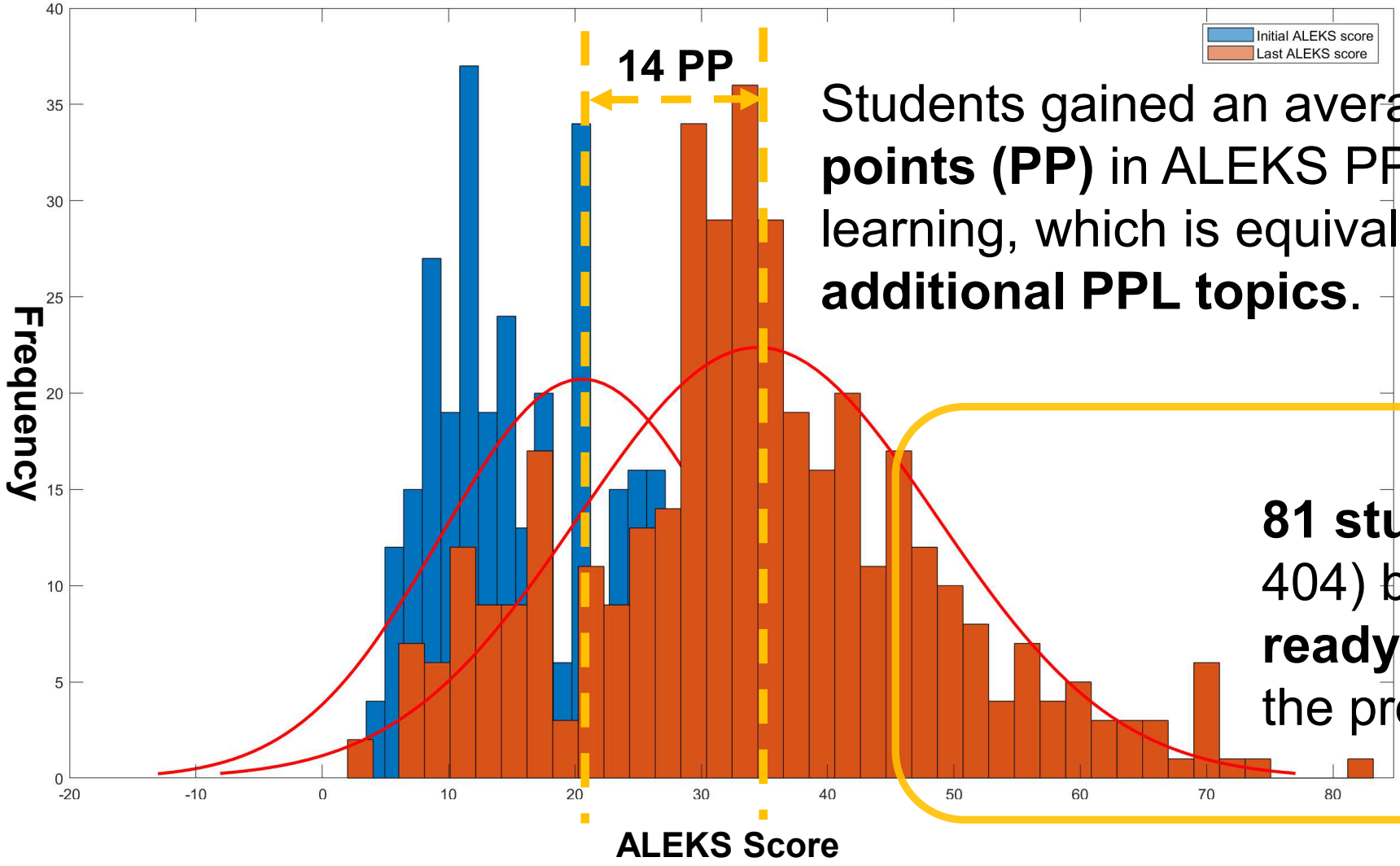
1. 3 hours of class time, once a week for 5 weeks
2. Required students to get an updated PPL score before next class
3. Added the 20 topics per week participation requirement
4. Did not allow for early exit
5. Allowed for only one hour of computer time in class
6. Built in time for discussions on college-related topics
7. Used a workshop model to split the class into groups that were ready to learn different set of topics
8. Two instructors per class, allowing for multiple pedagogical approaches
9. Supplemented with instructor-generated worksheets, emphasizing quantitative reasoning and group work

| **Week 2/3/4** | **Break-out class 1**<br>Instructor 1 | **Break-out class 2**<br>Instructor 2 |
|---|---|---|
| 9:05 - 10:00 | PPL range 1 | PPL range 2 |
| | Learn 10 topics with activities | Learn 10 topics with activities |
| 10:05 - 11:00 | PPL range 2 | PPL range 1 |
| | Learn 10 topics with activities | Learn 10 topics with activities |
| 11:05 - 12:00 | All students work in their Prep and Learning Module in the computer lab | |

# Sample class schedule in 2018

| | Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday |
|---|---|---|---|---|---|---|---|
| **Week 1** | 6/25 | 6/26 | 6/27 | 6/28 | 6/29 | 6/30 | 7/1 |
| 9:00 - 12:00 | | | | | 1. Go over syllabus with lead instructor<br>2. Create ALEKS logins<br>3. Take the ALEKS tour<br>4. Take the initial **proctored assessment (1)** and work in ALEKS for 20 minutes<br>5. Go over students' responsibilities/homework | LEARN in ALEKS **a minimum of 20 topics** AND for **a minimum of 5 hours** before the next class meeting | |
| **Week 2** | 7/2 | 7/3 | 7/4 | 7/5 | 7/6 | 7/7 | 7/8 |
| 9:00 - 9:05 | LEARN in ALEKS **a minimum of 20 topics** AND for **a minimum of 5 hours** before the next class meeting | | | | Meet in lab to receive break-out (BO) schedule | LEARN in ALEKS **a minium of 20 topics** AND for **a minimum of 5 hours** AND **take an unproctored assessment (2)** before the next class | |
| 9:05 - 10:00 | | | | | Attend BO 1 | | |
| 10:05 - 11:00 | | | | | Attend BO 2 | | |
| 11:00 - 12:00 | | | | | Work in ALEKS | | |
| **Week 3** | 7/9 | 7/10 | 7/11 | 7/12 | 7/13 | 7/14 | 7/15 |
| 9:00 - 9:05 | LEARN in ALEKS **a minium of 20 topics** AND for **a minimum of 5 hours** AND **take an unproctored assessment (2)** before the next class meeting | | | | Meet in lab to receive break-out (BO) schedule | LEARN in ALEKS **a minium of 20 topics** AND for **a minimum of 5 hours** AND **take an unproctored assessment (3)** before the next class | |
| 9:05 - 10:00 | | | | | Attend BO 1 | | |
| 10:05 - 11:00 | | | | | Attend BO 2 | | |
| 11:00 - 12:00 | | | | | Work in ALEKS | | |
| **Week 4** | 7/16 | 7/17 | 7/18 | 7/19 | 7/20 | 7/21 | 7/22 |
| 9:00 - 9:05 | LEARN in ALEKS **a minium of 20 topics** AND for **a minimum of 5 hours** AND **take an unproctored assessment (3)** before the next class meeting | | | | Meet in lab to receive break-out (BO) schedule | LEARN in ALEKS **a minium of 20 topics** AND for **a minimum of 5 hours** before the next class meeting | |
| 9:05 - 10:00 | | | | | Attend BO 1 | | |
| 10:05 - 11:00 | | | | | Attend BO 2 | | |
| 11:00 - 12:00 | | | | | Work in ALEKS | | |
| **Week 5** | 7/23 | 7/24 | 7/25 | 7/26 | 7/27 | 7/28 | 7/29 |
| 9:00 - 10:00 | LEARN in ALEKS **a minium of 20 topics** AND for **a minimum of 5 hours** before the next class meeting | | | | Logistics and last minute ALEKS catch-up | | |
| 10:10 - 12:00 | | | | | 1. Take the final **proctored assessment (4)**<br>2. Discuss indidivual math placement outcome | | |

# Student success in the 2018 ESM program

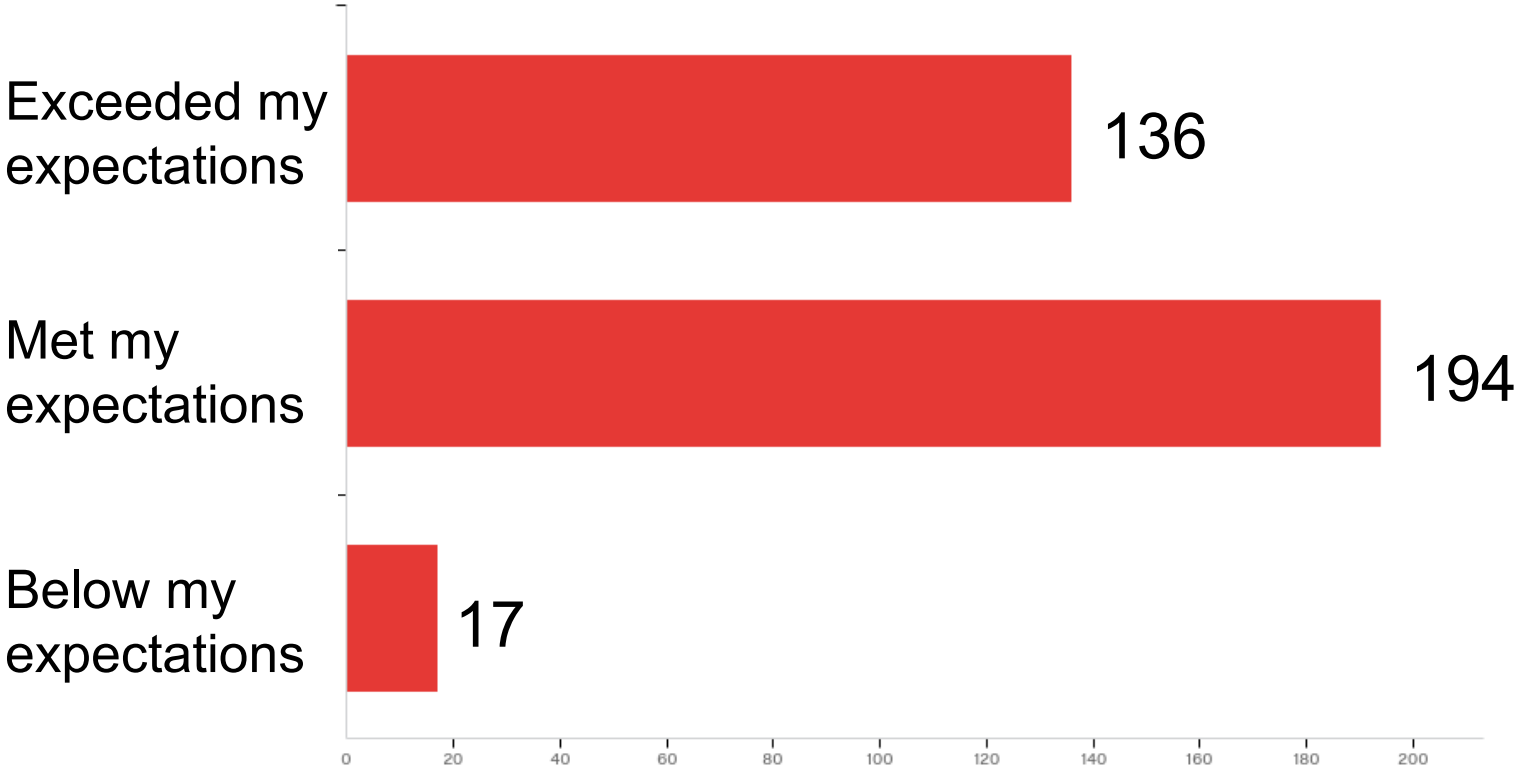



Students gained an average of **14 percentage points (PP)** in ALEKS PPL over 4 weeks of learning, which is equivalent to mastering **44 additional PPL topics**.

**81 students** (out of 404) became **college-ready** in conclusion of the program

# Student satisfaction in the 2018 ESM program

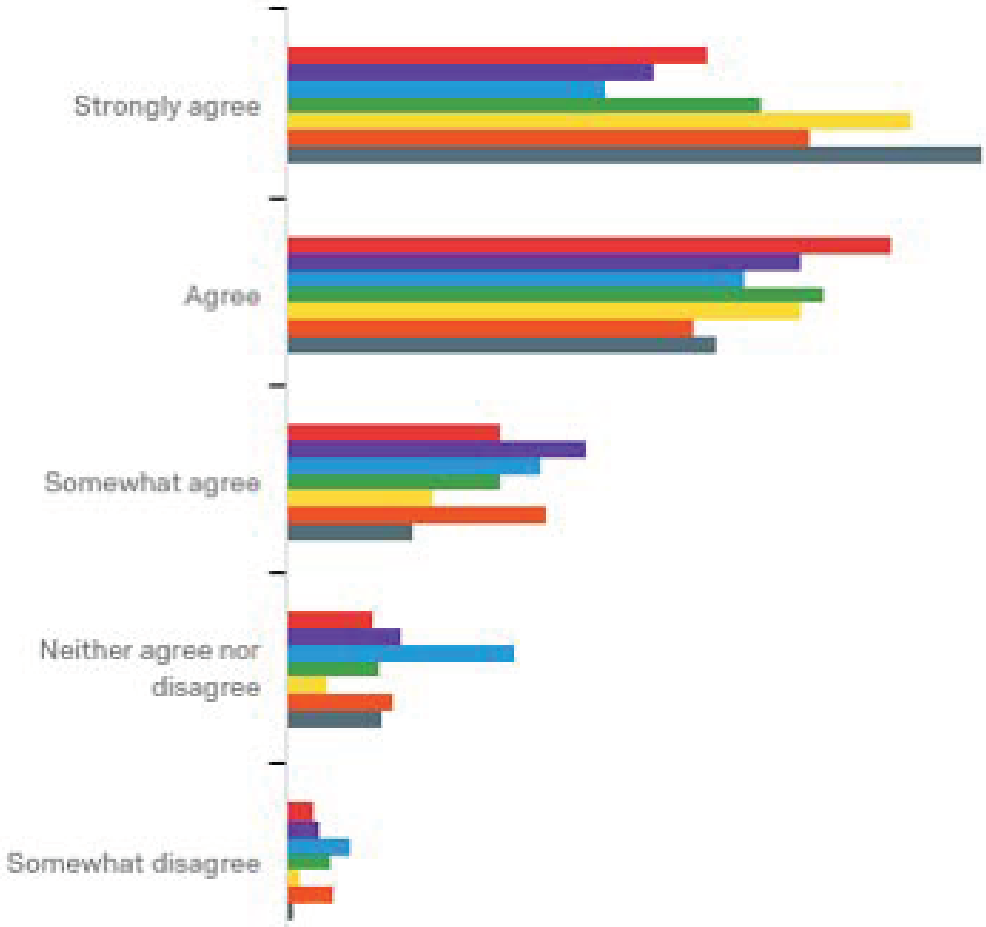
*Survey Question: "How was your overall ESM 1 experience?"*




**Over 95%** of the students surveyed felt the program met or exceeded their expectations

# Student satisfaction in the 2018 ESM program

*Survey Question: "Please rate the level of agreement to the following statements"*




- **2-instructor format worked**
- **ALEKS worked**
- **Break-out activities worked**
- **Students felt prepared for college**