

# FRESNO CITY COLLEGE

Fresno, California

## Case Study

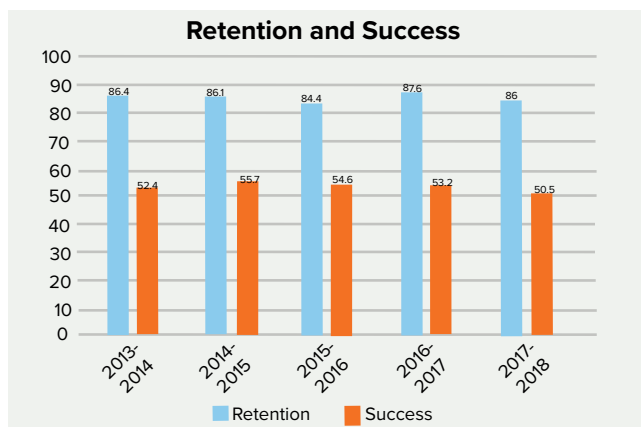
Professor Catherine Uvarov proposed an idea to her fellow Fresno City College Chemistry faculty members. Based on the fact that nearly half of FCC students failed to pass Introductory Chemistry in one semester, Professor Uvarov suggested they pilot a new mastery-based online homework system, ALEKS, and track not only whether it would improve their student's ability to pass the course the first time around, but also whether it helped students learn and retain material more effectively.

Historically at Fresno City College, Intro Chem is a required Chemistry course for many majors, including Nursing, and, as FCC has the largest associate degree Nursing program at a community college, it's a popular course with a consistently full waitlist. If a student earns a C or better in high school, they're able to move directly into General Chemistry; however, at FCC the General Chemistry course enrollment is 350 while the Intro Chem course enrollment sits at 1600. Additionally, the class between 2017-2019 was on average 55% Hispanic, 14.5% Asian, and 16.5% White. It was 64.5% female and 34.5% male on average (1% unknown) and 43.5% full-time and 56.5% part-time.

### Instructor Challenges

The Introductory Chemistry class at FCC had an 86% retention rate on average, however, students within the C or higher grade range were low, averaging 53%. This demonstrated that there was **a major gap between retention and success**, which needed to be addressed.

Additionally, **students were not doing homework with previous online homework system**. In Fall 2016, 34% of assignments had a zero score. Students credited their frustration to its lack of helpful feedback and that it did not pick up on minor mistakes.



## Evaluation / Pilot Stage Conclusions

Professor Uvarov knew that given the diverse student population of FCC, some students needed more remediation than others. This included the high percentage of returning adult students (25+ years old = 30%) transitioning into a new career path who had not been exposed to math courses in 10+ years. She wanted to support each student and offer a wide range of preparation, depending on what each student was ready to learn. Considering this goal and its adaptive nature, ALEKS was a clear choice.

Professor Uvarov oversaw 2 terms of pilots with a few of her colleagues and then chose to adopt ALEKS in Fall 2018 for her courses.

**Case Study Course/Term:** Introductory Chemistry (Chem 3A) / Academic Years 2017-2019

**Pilot:** Fall 2017, Spring 2018. **Adopted:** Fall 2018, Spring 2018, Fall 2019, Spring 2019.

**Implementation:** 17-week; Face-to-Face Lecture with Lab component

**Course Setup:** ALEKS (overall grade for ALEKS = 15%)

**Average Enrollment:** 30 students per Section

## Holding Students Accountable with ALEKS

Knowing that students in the past had not done assignments when using online homework in her face-to-face classes, Professor Uvarov came up with three strategies to hold students accountable:

1. Assigned ALEKS objectives with 2 due dates per week to keep students working and to create positive behaviors early
2. Added in review/ catch-up assignments 4 times in the term, allowing students to catch up. Students are incentivized to review during these times to increase grades for ALEKS progress goals.
3. Required students to keep track of their ALEKS work in a notebook.

She was able to draw a strong conclusion that **the 56.9% of students that did the notebook got a C or better** while 25% of students did not do the notebook and earned a D or F.

### ABOUT FCC

Fresno City College (FCC) is a public college founded in 1910, making it the oldest community college in California. It serves about 24,000 students each year and is recognized as a Hispanic-serving institution-- 55% of students identify as Hispanic and 48% of its population are first-generation college students. FCC offers 120 Associate Degrees, 96 Certificates of Achievements, and 80+ CTE Programs to its students and, through online courses and accelerated programs, it creates a welcoming space for its population of returning adults (typically 24 or older) who make up 40% of the student body.



With our diverse student population, I need a system that acknowledges that some students need more review and support than others. ALEKS allows me to understand where each student is coming in so I can better target my support without disrupting the needs of other students.

– Catherine Uvarov, Fresno City College

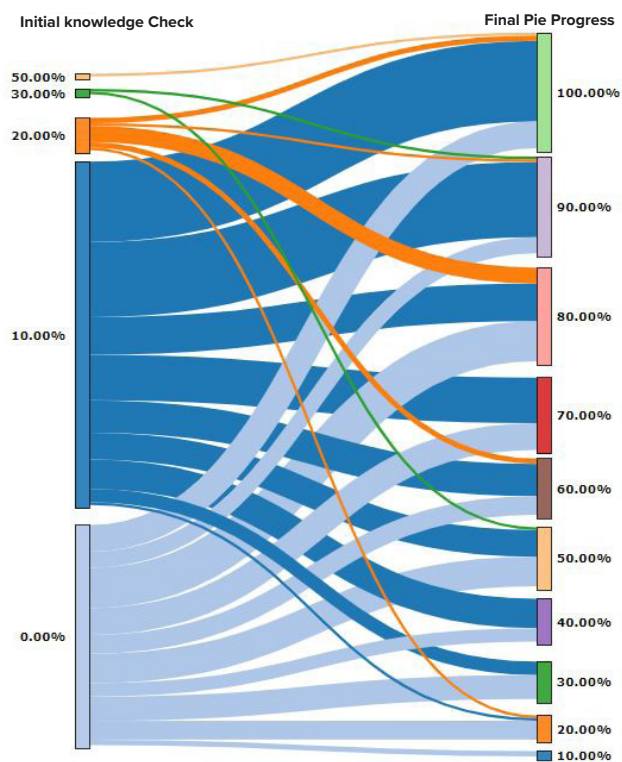
## Conclusions from the Pilot

1. Professor Uvarov saw a **wide range of Initial Knowledge Check scores**, as displayed to the right. This illustration represents all her students from Fall 17- Spring 19, about 250 in total. The left side of the graph represents the Initial Knowledge Check in ALEKS and the right side represents Final Pie Progress (percentage of mastered ALEKS topics). These scores are not an indicator of final grades in the class. All students start in a different place, but with ALEKS all students have the opportunity to finish at the same place. Overall, 57% of students score between 10-20% on their Initial Knowledge Check.

3. She was pleased to see **positive differences in student work** and noticed that they read explanations.

4. She **saw much better grade distribution** within her course, and **students performed better on the ACS final exam** as shown in the graph and table below. .

The positive results of this first semester encouraged Professor Uvarov to continue piloting in Spring 2018.



Sankey diagram created with the UC Davis Ribbon Tool (<https://ribbon.ucdavis.edu/>)

### Fall 2017 Letter Grades



### Fall 2017 and Spring 2018

	ALEKS	Previous Online Homework
Overall Average ACS Percentile	<b>53.3</b> 49.6	<b>45.8</b>
Percent of Class above 50th Percentile	<b>47.2%</b> 47.8%	<b>43.2%</b>
Average ACS Percentile for Students above 50th Percentile	<b>82.8</b> 73.6	<b>75.5</b>
Average ACS Percentile for Students below 50th Percentile	<b>26.9</b> 27.5	<b>23.3</b>

■ Fall 2017 ■ Spring 2018



There's simply no replacement for practice and since ALEKS makes you do things over and over until you get it right, it works. I prefer using ALEKS because of the results.

– Student, Fresno City College

## Data-Informed Instruction:

The reports in ALEKS helped Professor Uvarov assess progress and challenges. She used the Time & Topic Report to make a list of who to speak with during lab regarding poor habits. Then she used the ALEKS Pie Report to put together warm-up problems. She also liked looking at the Progress Report to see how far everyone is with their homework, and to see who is online right before something is due.

## Results

Professor Uvarov continued to pilot ALEKS in her course in the spring of 2018 and adopted ALEKS for the fall of 2018. Here are her major takeaways from tracking her student's progress:

1. Most importantly, the **number of students moving above the 50th percentile in the ACS exam increased all three semesters.**
2. Her students were earning **more A and B grades**, and less F grades.
3. **Students were performing better on the ACS exam**, which acted as their final exam for the class, demonstrating that students retained more throughout the term.

Fall 2018 and Spring 2018 and 2019		
	ALEKS	Previous Online Homework
Overall Average ACS Percentile	50.9 49.6 54.9	45.8
Percent of Class above 50th Percentile	56.7% 47.8% 62.5%	43.2%

■ Fall 2018 ■ Spring 2018 ■ Spring 2019

Retention and Success							
	F16*	F17	F18	F19	S17*	S18	S19
Percent C or better (Based on final Enrollment)	53.5%	57.8%	60.8%	64.2%	60.8%	47.7%	71.4%
Average GPA of Successful Students (Based on final Enrollment)	2.5	3.1	2.7	2.6	2.5	2.6	2.6
# of Students	54	45	51	54	101	101	56

\*before ALEKS implementation

## SPOTLIGHT

### Instructor Profile

Dr. Uvarov has been a Chemistry Instructor at Fresno City College since Fall 2016. Before coming to Fresno City College, she was a temporary lecturer for general chemistry courses at UC Davis. After beginning at Fresno City College, an open-access community college, Dr. Uvarov experienced a much broader range of student preparedness in her Introductory Chemistry course and wanted to help close the gap and improve the student success rate. She chose ALEKS due to the adaptive nature, and her prior experience. Several full-time faculty members piloted ALEKS during the 2017-2018 academic year, and decided to adopt ALEKS as the online-homework system of choice beginning Fall 2018 and continue data-collection. In the past two years, she has revised her ALEKS course design to motivate more students to stay on-track and be successful in the course.

## Conclusions and Next Steps

Professor Uvarov's colleagues are paying close attention to her results and a few are now interested in implementing ALEKS in their own classrooms. Starting in Fall 2018, if Introductory Chemistry instructors want to use online homework, they will use ALEKS.

Professor Uvarov continues to fine-tune her course to motivate students and help hold them accountable for their learning.