Student retention through online faculty and student learning: Documenting and measuring impact on Hispanic students

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Institutional Context

• Sacramento State University
  o Public university
  o 30,000+ students
  o Hispanic Serving Institution since 2016

• Project Components
  o Student Tutorial "Learning Online"
  o College Assistance Migrant Program (CAMP) technology program
  o Faculty Professional Development
  o STEM and GE Course Redesign
Today’s Plan

Data and evidence on how students, specifically Hispanic students, are measurably impacted by:

- Online Learning Tutorial: ”Hornet Learning Online 101”
- Technology loan program: CAMP technology program
- Faculty Professional Development: Faculty Learning Communities
- Course Redesign: STEM and GE courses
Hornet Learning Online 101:

- One hour optional tutorial*
- Delivered self paced online
- Basic Canvas use and navigation
- Growth mindset
- **Online learning readiness survey**
- Comprehensive directory for tutoring, advising, mentoring, basic needs, etc.
- Guidance on using AI

* Based on CSU Channel Islands and Humboldt tutorial courses
Student Online Tutorial: Hornet Learning Online 101
Evidence of Impact on Hispanic Students

- 9480 surveys collected over 4 years
- Survey sample reasonably matches the campus demographics
- 3812 students (40.2%) identified as Hispanic

Number of students completing Online Learning Readiness survey

Student Demographics

<table>
<thead>
<tr>
<th>Year</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>2500</td>
<td>3800</td>
<td>1500</td>
<td>1000</td>
</tr>
</tbody>
</table>

![Student Demographics Chart](chart.png)
Student Online Tutorial: Hornet Learning Online 101
Evidence of Impact on Hispanic Students

Online Learning Readiness Survey:

- 21 questions on
  - Computer Skills
  - Time Management
  - Academic Skills
- Responses linked to student IDs and campus demographic files
- Responses disaggregated by ethnicity
- Analyzed for statistically significant differences between student ethnic groups

<table>
<thead>
<tr>
<th>Question</th>
<th>3 = Agree</th>
<th>2 = Neutral</th>
<th>1 = Disagree</th>
<th>0 = Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have regular access to a reliable computer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I have reliable access to a high-speed Internet connection (DSL, cable, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Analysis Summary:
Strengths: Means >= 2.75 highlighted green
Challenges: Means are <= 2.5 highlighted orange
Overall counts of strengths (G) and Challenges (O)

Specifically for Hispanic Students:
Strengths:
• Regular access to reliable computer
• Prioritizing responsibilities
• Following written instructions

Challenges:
• Having someone to help with computer challenges
• Managing time
• Participating in live class discussions

Overall:
• Hispanic students had 8 areas of strength and 5 areas of challenge compared to 14 areas of strength and 1 area of challenge for white students
• Hispanic students self assess as feeling less prepared
Data is evidence of "what" is happening
Next step is to find out the "why"

To investigate the "why" we focused on the CAMP program:

- College Assistance Migrant Program (CAMP)
- Serves 85 first year students from families engaged in agriculture related work
- Majority of students are Hispanic
- Graduation rate declined sharply during remote online instruction Fall 2020-Spring 2022
  - Spring 2020: 57 graduates 76% of cohort
  - Spring 2021: 64 graduates 85% of cohort
  - Spring 2022: 29 graduates 39% of cohort
College Assistance Migrant Program (CAMP) Insights into the "why"

Why were items in the survey challenges?

- Access to reliable high-speed internet connection. The majority of CAMP students come from rural areas where there is no reliable internet access.
- Access to someone who can help with computer challenges. Understanding that a great percentage of CAMP students are first generation and live at home. They don’t have someone who can they turn for help within their household or family member.
- Managing time: The majority of the students have jobs. Any time they have available, they use it to work and put less time on their studies.
- Setting aside a regular 5-8 hours per week to devote to an online class. We experienced these challenges with online classes with our CAMP students during COVID. i.e. we had student who called the office as that their parents did not understand why students would spend so much time online and were urged to find a job. At the CAMP office, we met with student parents to explain the nature of online classes and the important for their sons/daughters to continue their studies online. To many parents only active physical labor = work. Passive computer use is not perceived as work.
Even survey questions that appeared to be a strength for Hispanic students proved to have challenges:

Ex. Access to a reliable computer: Although 94% of Hispanic students reported having regular access to a reliable computer the CAMP program observed students attempting to take Engineering final exams on their mobile phones and other students without computers despite access to a campus computer loan program.

Aha moment: The campus computer loan process is not culturally responsive. It requires students to ask faculty to justify the loan and put in a request through central IT business unit.
College Assistance Migrant Program (CAMP): Solution phase 1: technology program Fall 2023

National Science Foundation Funded laptop loan program: 50 computers

- Long term computer loan (1 year or more) through the CAMP program from CAMP staff students know and trust. 9 computers on long term loan

- Short term computer loan inside the CAMP center where students can build community within the CAMP program and complete academic work with the support of peers and CAMP staff. 15 computers available for short term check out, at least 10-12 computers are used at any given time every day. That’s an average of 50-60 check-outs per week
Empowering CAMP Students Through the Computer Loan Program!

NSF STEMZone
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Faculty Professional Development (PD): Evidence of Impact on student grades

• Assumption: Enhancing instruction through PD improves student learning and grades

• Theory of Change

• Research gap: Limited measures of impact of PD on student outcomes in higher education such as grades and/or retention.

Effective PD is designed and implemented

Faculty learn effective teaching strategies

Faculty implement effective teaching strategies

Student learning improves

Students get better grades
Research Study focused on STEM

Question:
Can faculty development make a measurable impact on student course grades in STEM?

Time frame:
Fall 2019-Fall 2020

Data sources:
• Institutional faculty, student, course, and demographic data
• Program completion data on two types of PD programs
STEM faculty participated in two Faculty Professional Development Programs

General
- Develop online (Canvas) courses
- All disciplines
- Over 700 participants
- Cohorts of 30
- 3 weeks
- Asynchronous online
- STEM faculty reacted negatively

STEM Sidecar
- Engage students online
- Engineering, Natural Science & Math
- 68 participants
- 7 small groups
- 6 weeks
- Synchronous online
- Faculty responded positively
Difference-in-Difference Analysis

(1) $Y_{STEM} = B_0 + B_1(STEM \ PD) + B_2(POST) + B_3(STEM \ PD*POST)$

(2) $Y_{General} = B_0 + B_1(General \ PD) + B_2(POST) + B_3(General \ PD*POST)$

- $B_0 =$ average course grade of students taught by control group instructors in the pre-PD period
- $B_1(STEM \ PD)$ and $B_1(General \ PD) =$ difference in the average course grade in the pre-PD period of instructors in teach PD group, compared to the control group.
- $B_2(POST) =$ difference in average course grade of control group instructors from the pre-PD period to the post-PD period.
- $B_3(STEM \ PD)$ and $B_3(General \ PD) =$ difference-in-difference (pre-post difference between average course grade of the treatment group minus pre-post difference in average course grade of the control group).
• General PD participants' course grades started out higher than those of STEM PD participants and non-participants.

• General PD participants' course grades rose the same amount as those of non-participants.

• STEM PD participants' course grades rose significantly more than those of non-participants.
• General PD participants' DFW rate started out lower than those of STEM PD participants and non-participants.

• General PD participants' DFW rate decreased the same amount as those of non-participants.

• STEM PD participants' DFW rate decreased significantly more than those of non-participants.
Neither PD Improved Equity Gap in Course Grade

**No Treatment**
- DID = -0.05

**General PD**
- DID = -0.03

**STEM PD**
- DID = 0.018
STEM PD Improved Equity Gap in DFW Rates

**No Treatment**
- DID = 4.6%
- DFW Rate (2019-2020):
  - Non-URM: 19.7 → 14.4
  - URM: 22.0 → 12.1

**General PD**
- DID = 2.8%
- DFW Rate (2019-2020):
  - Non-URM: 14.4 → 9.9
  - URM: 15.6 → 8.3

**STEM PD**
- DID = -1.3%
- DFW Rate (2019-2020):
  - Non-URM: 19.3 → 12.4
  - URM: 14.1 → 8.5
What Made faculty PD Effective?

Effective faculty PD
1. Is discipline specific
2. Implements and models adult learning theory
3. Structures authentic collaboration among faculty
4. Models effective curricular planning and teaching practices
5. Provides coaching and expert support
6. Includes time for intentional reflection
7. Occurs over a sustained duration
Course Redesign: Evidence of Impact on Hispanic Student Grades Physics 11A
Course Redesign: Evidence of Impact on Hispanic Student Grades ENGR124
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