

# Examining Student Persistence in the Chemistry Course Sequence

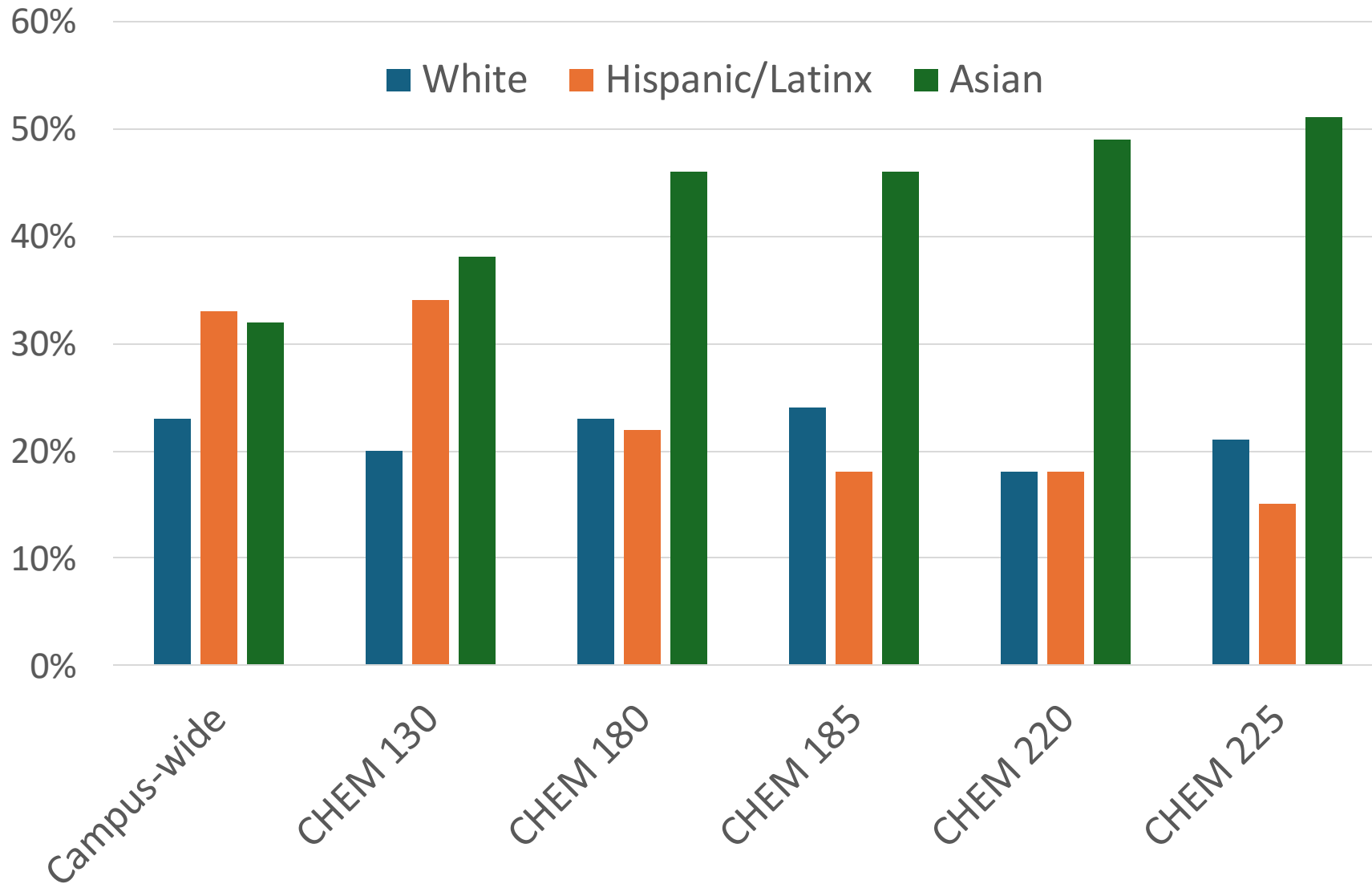


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# Context: Chemistry Course Sequence

Chemistry Course	Who needs it?
<b>CHEM 130:</b> Preparatory Chemistry	-Non-majors -Pre-req for CHEM 180 (unless they pass the placement test)
<b>CHEM 180:</b> General Chemistry A <b>CHEM 185:</b> General Chemistry B	-Start of majors'-level chemistry courses -Most science majors take these
<b>CHEM 220:</b> Organic Chemistry A <b>CHEM 225:</b> Organic Chemistry B	-Needed for Chem, Bio, Biochem majors + post-grad health programs (Pre-Med, Pre-Pharmacy, etc.)

# Enrollment by Race/Ethnicity (2022-2023)



*Data collected from GWC Data Dashboard*

## Observation:

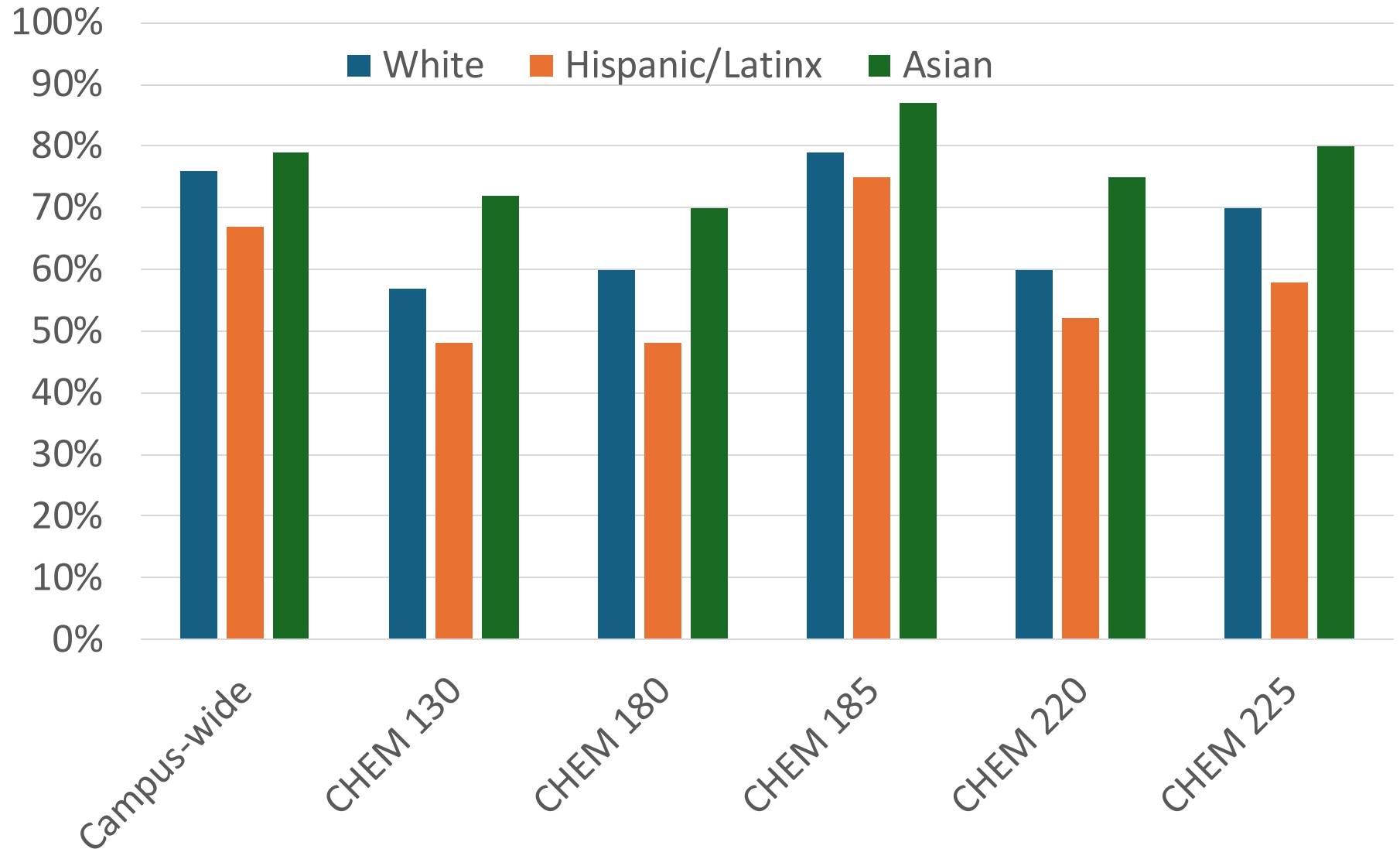
Hispanic/Latinx persistence and enrollment numbers drop as they progress through the chemistry sequence

**Focus:** Three largest demographic groups at GWC

# Success Rates by Race/Ethnicity (2018-2023)

## Observation:

Hispanic/Latinx students generally have lower success rates compared to other groups



*Data collected from GWC Data Dashboard*

**Question:** Other than success rates, what else could be affecting persistence in Hispanic/Latinx students?

**Sub-Questions:**

- What majors are students choosing?
- What academic resources are being utilized?
- Is there a sense of community/belonging?
- Are students struggling with work/school balance?
- Are instructors providing/advertising course resources proven to increase student success for Hispanic/Latinx students?

# Method: Chemistry Student Survey

- All chemistry courses were surveyed during Week 13

Course	CHEM 130	CHEM 180	CHEM 185	CHEM 220	CHEM 225
Total Enrolled	102	122	73	36	32
Responses	47 (46%)	46 (38%)	38 (52%)	33 (92%)	31 (97%)
White	5	10	6	9	6
Hispanic/Latinx	11	8	6	5	1
Asian	23	20	23	12	21

*Students were given a survey on Google Forms. Some instructors gave the survey in class while others administered it online. Most questions were multiple choice, but there were also free-form questions and spots for comments.*

# Survey Question: What is your major?

- **Focus:** CHEM 180 (General Chemistry A) – 46 respondents

Even though Hispanic/Latinx students are choosing majors (i.e. Biology) that require upper-level chemistry courses, less of them make it to those courses.

Subgroup (% of respondents)	Chemistry	Biology	Biochemistry	Engineering	Health Science/ Pre-Health	Other STEM
White (22%)	0%	50%	0%	20%	10%	20%
Hispanic/Latinx (17%)	0%	62.5%	0%	25%	12.5%	0%
Asian (44%)	20%	25%	10%	15%	15%	15%

# Survey Question: Are you working this semester?

- CHEM 180 (General Chemistry A) – 46 respondents

Subgroup (% of respondents)	Yes	avg grade*	No	avg grade*
White (22%)	40%	2.3 (C)	60%	3.0 (B)
Hispanic/Latinx (17%)	62.5%	1.4 (D)	37.5%	3.0 (B)
Asian (44%)	45%	3.3 (B)	55%	2.6 (C)

- 1) More Hispanic/Latinx students are working while going to school (compared to other groups).
- 2) Those that are working have a lower average course grade.

*\*avg grade was calculated using the 4-point scale (A=4, B=3, C=2, D=1, F=0)*



# Survey Question: Are you working this semester?

- CHEM 130 (Preparatory Chemistry) – 47 respondents

Subgroup (% of respondents)	Yes	avg grade*	No	avg grade*
White (11%)	60%	1.3 (D)	40%	2.5 (C)
Hispanic/Latinx (23%)	91%	1.7 (D)	9%	3.0 (B)
Asian (49%)	61%	2.3 (C)	39%	1.8 (D)

In CHEM 130, even more Hispanic/Latinx students are working while going to school (compared to CHEM 180).

*\*avg grade was calculated using the 4-point scale (A=4, B=3, C=2, D=1, F=0)*

# Survey Question: Are you working this semester?

- CHEM 185 (General Chemistry B) – 38 respondents

Subgroup (% of respondents)	Yes	avg grade*	No	avg grade*
White (16%)	100%	3.3 (B)	0%	--
Hispanic/Latinx (16%)	33%	3.0 (B)	67%	3.0 (B)
Asian (61%)	74%	2.9 (C)	26%	3.2 (B)

**Less** Hispanic/Latinx students are working as they progress to upper-level chemistry courses (vs. other groups)

*\*avg grade was calculated using the 4-point scale (A=4, B=3, C=2, D=1, F=0)*

# Survey Question: Sense of Belonging (CHEM 180)

- Students were asked 8 different questions to assess their “sense of belonging”
- Scale of 1-5 (5 = Strongly Agree, 1 = Strongly Disagree)
- **Notable:** Among the white student population, NONE of them put “disagree” or “strongly disagree” for ANY metric.
- No other notable differences in the averages
- Student Comment (Hispanic/Latinx):

"There are hardly any people with the same background as me, where are my people :-(

# Survey Question: Program Awareness

- For Hispanic/Latinx students in CHEM 180

Program	Never heard of it	Heard of it but not involved	Actively involved
Raíces	62.5%	37.5%	0%
Puente	50%	50%	0%
MESA	62.5%	12.5%	25%

**Conclusion:** We need to do a better job getting our chemistry students involved in these programs (*demonstrated to help student success!*)

# Preliminary Findings

- Hispanic/Latinx students are working more while going to school (compared to other groups), correlates with lower grade averages
- Hispanic/Latinx students are largely not aware of or participating in programs aimed at increasing retention and student success
- Students are not getting help from tutors even when performing poorly in the course

# Next Steps (Survey)

- Readminister survey in Fall 2024
  - Earlier in semester
  - Get more faculty buy-in to get more responses in person
  - Rework some of the questions
- Analyze data in-depth for other Chemistry courses
  - CHEM 130, 185, 220, 225

# Next Steps (Action Items)

- Look into getting program presentations into the chemistry classrooms (especially Chem 130 and 180)
  - Raíces, Puente, MESA, etc.
- Investigate/adjust course policies to better accommodate students that are working while going to school
  - Involves examining what individual instructors are currently doing and seeing where adjustments can be made
- Better planning with course tutors and their scheduled hours
  - Involves significant collaboration (Academic Success Center, instructors, tutors, enrolled students, etc.)





# Other survey questions...

- **Do you use the free tutoring services at GWC?**
  - Most CHEM 180 students do **not**
  - Those that don't stated that that the biggest reason was that tutoring times do not work in their schedule
- **What course policies help contribute to your success?**
  - Students didn't seem to understand how to answer this question (rework)
- **Are you planning to take additional chemistry courses at GWC?**
  - No interesting correlations made with this data (rework)
- **Are you a full-time or part-time student?**
  - No interesting correlations made with this data

# Survey Question: Sense of Belonging (CHEM 180)

- **Averaged on a Scale of 1-5** (5 = Strongly Agree, 1 = Strongly Disagree)

Subgroup (% of responses)	I feel welcome here among chem students	Other students have similar background to me	Chem faculty make me feel welcome	Chem faculty treat me fairly and care about my success	Chem faculty are responsive to my requests & questions	I feel comfortable asking for help from chem faculty	I feel comfortable asking for help from my classmates	I have found a sense of community in the chem department where I feel like I belong
White (22%)	4.5	3.8	4.6	4.7	4.7	4.5	4.5	3.8
Hispanic/ Latinx (17%)	4.3	4.0	4.4	4.1	4.5	4.6	4.3	3.8
Asian (44%)	4.2	3.9	4.3	4.2	4.3	4.2	4.0	3.6