

How do STEM college support programs impact minoritized Asian Americans?

The experiences of HMoob students at UW–Milwaukee



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Summary

On account of model minority discourse (Suzuki, 2002; Ng & Lee, 2007; Chen & Buell, 2018; Kang et al., 2021; Zheng et al., 2024), and of the numerical over-representation of Asian Americans as an aggregate in STEM disciplines (Ma, 2010; Xiong & Lam, 2013), Asian Americans are often excluded from research, policy, funding, and advocacy to address barriers and racial disparities in STEM education and careers (Museus, 2009; Teranishi et al., 2004). This approach erases the challenges and experiences of minoritized Asian Americans (Kang et al., 2021; Chen & Buell, 2018), such as HMoob and other Southeast Asians who continue to face barriers to STEM attainment (Wolfgram et al., 2024). Drawing on a survey of HMoob American students in the University of Wisconsin System (n=669), and on an interview study of HMoob students at UW–Milwaukee (n=32), we report the demographic and academic characteristics of HMoob students in the state, and important insights from the analysis of interviews.

Namely, we found that HMoob students in both STEM and non-STEM programs experienced a diminished sense of campus belonging on account of:

1. Competitive or alienating **disciplinary cultures** in their academic programs;
2. **Academic advising** that was sometimes experienced as inconsistent, superficial, transactional, or alienating, in part due to high advisor turnover;
3. Challenges obtaining academic and career **mentorship**; and
4. **Financial challenges** which frustrated and distracted from academic and extra-curricular engagement.

Research indicates that experiences of campus belonging are associated with academic persistence and attainment (Hurtado & Carter, 1997), which is also the case for minoritized students who face barriers to college success (Brady et al., 2020; Museus et al, 2017). At UW–Milwaukee, some HMoob students in STEM are provided with targeted advising, peer and faculty mentorship, and additional financial resources to support their STEM attainment—and the interviews indicated that these additional supports can **serve as an effective counter-measure to the factors that tend to push out minoritized Asian Americans from STEM programs.**

Thus, the evidence presented in this report is that there is a need for additional supports for minoritized Asian Americans in STEM programs—and that such supports are effective at facilitating belonging and encouraging academic persistence. Federal agencies such as the National Science Foundation (NSF) and the National Institutes of Health (NIH), and college support programs that are designed to broaden STEM participation by removing barriers for racially minoritized students, **should re-define the concept of “underrepresented minorities” (URM) to include minoritized Asian Americans, such as HMoob and other Southeast Asian Americans.**

Introduction

Asian Americans are often represented as a model minority who excel in STEM education and professions, which is a stereotype that erases the challenges encountered by minoritized Asian Americans who may face educational challenges in STEM pathways—including in particular Southeast Asian American students (Suzuki, 2002; Ng & Lee, 2007; Chen & Buell, 2018; Kang et al., 2021; Zheng et al., 2024). Research and other efforts to address inequality in higher education, through activism, policy, and funding, have tended to exclude Asian Americans because they are assumed to be high achieving model minorities (Museus, 2009; Teranishi et al., 2004). Programs designed with the explicit purpose of supporting minoritized college student participation in STEM, such as the National Science Foundation’s Louis Stokes Alliances for Minority Participation (2024), exclude Asian Americans (included Southeast Asian Americans) from the definition of **“underrepresented minorities” (URM)**, who may be in need of consideration and support; and Asian Americans are excluded from US Government policy for expanding STEM participation of minoritized students over the next decade (National Science & Technology Council, 2018). On account of this perception, funding and other supports aimed at enhancing the inclusion and success of minoritized college students in STEM programs frequently omit Asian Americans, including HMoob (or Hmong) Americans—a refugee community in Wisconsin—who face educational barriers. A recent example of the impact of the model minority stereotype on limiting the STEM education opportunities for HMoob students is the case of a graduate student, Kao Lee Yang (2021), whose nomination for an NSF fellowship was rejected due to her identification as an Asian American on her application (that is, not a qualifying URM)..

Asian Americans are often excluded from research on the mental health needs and risk factors of college students, and when they are included, the data is not disaggregated by ethnicity (Xiong & Lam, 2013). Furthermore, the National Institutes of Health does not include any Asian Americans groups among those identified as underrepresented (National Institutes of Health, 2023; Shivaram, 2021). Similarly, Ma (2010) points out that Asian Americans are the only minority group excluded by all federal initiatives to promote the representations of racial minorities in STEM fields. Due to the exclusion of minoritized Asian Americans from STEM intervention programs and scholarships, there is a call for disaggregation of data, and for governmental agencies to redefine their policies surrounding historically underrepresented racial and ethnic minority groups.

This report analyzes demographic and educational characteristics and experiences of HMoob college students at UW–Milwaukee, based on responses to a survey of HMoob college students in UW System conducted in Spring of 2023 (n=669; 40% responses rate); and based on interviews with HMoob students (n=32) at UW–Milwaukee—a public, urban, open-access university with Research 1 status, which serves a large proportion of the HMoob college students in the state. At UW–Milwaukee, the NSF’s Louis Stokes Alliances for Minority Participation—in Wisconsin, called WiscAMP—recognizes the need for additional supports for their HMoob students in STEM. Thus, to address this unmet need, WiscAMP draws upon **non-NSF UW Systems and other funds** to include those students in the program. This setting

provided an ideal context to study the barriers and challenges that HMoob students experience in STEM and non-STEM programs, and the role and impact of targeted recourses and supports in addressing those challenges. The report provides an analysis of the education and other experiences of HMoob students at UW–Milwaukee, comparing those in non-STEM programs (n=16), and those in STEM programs who did not have the benefit of targeted STEM–pathway supports provided by the WiscAMP program (n=11) and those in STEM programs who did have the benefit of targeted WiscAMP supports (n=5). We address the following research questions:

1. What are the demographic and academic characteristics of HMoob students in Wisconsin and at UW–Milwaukee?
2. How do HMoob college students experience STEM programs at UW–Milwaukee?
3. How do HMoob students in STEM experience the WiscAMP program and how does it impact their STEM education pathways at UW–Milwaukee?

The demographic and academic characteristics of HMoob student in the UW System and at UW–Milwaukee are presented in the Methods section below. The interviews conducted with students at UW–Milwaukee reveal common challenges faced by both STEM and non-STEM students.

HMoob Americans and HMoob in Wisconsin

The HMoob are an ethnic group with historical roots tracing back to Southern China who experienced centuries of political displacement across Southeast Asia. HMoob history has been largely excluded from American education, neglecting their contributions during the Vietnam War and obscuring the exploitation they faced by the U.S. Central Intelligence Agency (CIA), who recruited the HMoob as guerrilla soldiers in 1964 to serve in the US "Secret War" in Laos. Following the U.S. troop withdrawal from Vietnam in 1973, and the rise of communist regimes in Vietnam, Laos, and Cambodia in 1975, many HMoob fled persecution and sought refuge in Thailand. Ultimately, a majority of the HMoob who fled into Thailand were resettled in the United States, while others found new homes in other countries. Upon resettlement, numerous HMoob immigrants encountered socio-economic challenges on account of language disparities, educational barriers, discrimination, and poorly funded and conducted refugee resettlement policy (Vang, 2010).

Today, California, Minnesota, and Wisconsin hold the largest population of HMoob Americans. In Wisconsin, the HMoob population increased from 47,127 in 2010 to 59,238 in 2020. HMoob Americans constitute the largest Asian ethnic group in the state, accounting for 33% of all Asians. Among Wisconsin counties, Milwaukee has the highest total HMoob population, with 13,653 individuals (Applied Population Laboratory and UW Extension, 2020). Upon resettling in the United States, HMoob Americans 25 years and older had made great improvements in attaining post-secondary education degrees in the early 2000s. As a result of the growing emphasis on higher education, poverty rates for HMoob Americans are decreasing (Xiong, 2012; 2020). However, compared to the early 2000s, data acquired from the UW Systems indicates that HMoob undergraduate student enrollment at public universities has been low and declining in 2015 (UW Systems, n.d.). Furthermore, the impact of the pandemic has exacerbated this trend; and these findings underscore the need for targeted support and nuanced policies to address challenges faced by minoritized Asian American students.

Literature Review: Asian Americans in STEM

The exclusion of Asian American from the URM category is in part due to the racialization of Asian Americans as a model minority who have achieved economic and educational success in the United States. Prior to World War II, with the massive immigration of Asian migrants, they were often perceived as the “yellow peril”, represented as an invasive threat to White American jobs and opportunities. However, in the post-WWII era marked by domestic growth and Cold War geopolitics, the demand for STEM specific labor such as engineers and medical practitioners intensified (Min, 2005; Chen & Buell, 2018).

Without enough workers to meet the demand, Asian Americans emerged as the main target for recruitment of skilled labor and were casted as “idealized labor.” This portrayal depicted them as docile, hard-working individuals willing to be compensated at a lower wage, ultimately benefiting corporations predominantly run by White Americans (Chen & Buell, 2018). As the archetype of “idealized labor” solidified, Asian Americans became associated with the model minority stereotype, which posits that their success stems from individual merit, unwavering work ethic, and innate talents in STEM (Suzuki, 2002; Ng & Lee, 2007; Chen & Buell, 2018; Kang et al., 2021; Zheng et al., 2024).

From being viewed as a “yellow peril” to becoming the “idealized labor,” and now associated with high achievement in STEM, Asian Americans have been pitted against Black, Latinx, and Indigenous communities, rendering them as deficient compared to Asian Americans (Wu, 2014; Poon et al., 2016; Lee et al., 2017; McGee, 2018; Walton and Truong, 2023). Furthermore, it is important to consider the profound impact of the Covid-19 pandemic on Asian Americans. Since the racial naming of the Covid-19 virus, there has been a resurgence of the “yellow peril” discourse, fostering instances of discrimination, xenophobia, and violence against Asian Americans (Gover et al., 2020; Kimura, 2021). The pandemic not only exposed anti-Asian racism, but also revealed a disproportionate impact on minoritized communities that widened gaps in education, employment, and access to health care.

The diverse educational needs and challenges of Southeast Asian American students must be acknowledged in order for institutions to provide educational support these students in STEM. The use of disaggregated data helps reveal the unique experiences, as well as aid in the understanding of the diverse educational needs of underrepresented Asian American ethnic minorities (Suzuki, 2002; Maramba, 2011; Museus, 2009).

The LSAMP program in Wisconsin: WiscAMP

The Louis-Stoke Alliances for Minority Participation (LSAMP) is a program created and funded by the NSF as an investment in broadening the participation in STEM education (James & Singer, 2016; NSF, 2024). Through LSAMP, alliances were created across the U.S. to assist universities in diversifying the STEM fields by increasing the participation of URM students. LSAMP define URM as racial and ethnic groups historically underrepresented in STEM such as Black/African Americans, Hispanic/Latinos, Native American/Alaskan Natives, Native Hawaiian or Pacific Islanders, women, and persons with disabilities

(Rodriguez et al., 2013, James & Singer, 2016; LSAMP, 2020). Notably excluded from this definition are Asian American students, including Southeast Asian American students who face barriers to succeed in STEM programs.

For students served by LSAMP, there is a continuous emphasis on augmenting the retention rate of students in STEM, fostering persistence in active engagement among STEM learners, and enhancing STEM recruitment through targeted interventions such as mentorship programs, workshops, and discipline-specific opportunities tailored for STEM students. Notably, their summer bridge programs were designed to acclimate incoming freshmen to both campus lifestyle and STEM curricula (Lisberg & Woods, 2018). Additionally, these summer bridge programs utilize a collaborative approach that valued "...peer groups learning group techniques, faculty mentorship, and academic supplementary support on URM academic achievement and persistence in STEM" (Ghazzawi, Pattison, Horn, & Wilson, 2022). As a result of the additional assistance provided for URM students, incoming students attending summer bridge programs gained a better understanding of college life, felt confident and prepared to continue to pursue their major (Brady & Gallant, 2021), expanded their connections through peer mentors who prompted networking during events and collaborative assignments, increased their persistence rate in STEM fields and lowered drop-out rates for URM students (Ghazzawi et al., 2022). Students also gained a sense of belonging and community that enhances their learning abilities in their respective field alongside their cohorts (Okijie, Tchounwou, & Idusuyi, 2021).

While the NSF's definition of URM excludes Asian Americans as a group, there is evidence that Southeast Asians face barriers to college success. In response, the UW-Milwaukee STEM-Inspire WiscAMP program employs **non-NSF UW System and other funds** to support some of these students and include them in the program (Rodriguez et al., 2013). Unlike other LSAMP programs across the U.S. that operate primarily during the summer, UW-Milwaukee WiscAMP provides support during the academic year. This provides an appropriate context to study the need and impact of targeted STEM resources and engagements for minoritized Asian Americans, such as HMoob college students.

Methods and Research Sample

The HMoob American College Paj Ntaub study

The HMoob American College Paj Ntaub study is a community-based participatory action research (CBPAR) initiative in collaboration with the HMoob American Student Committee (HMASC), a UW–Madison student organization dedicated to advocating for the HMoob student community. This project focuses on examining the college experiences of HMoob students within the context of four-year predominantly white institutions (PWIs). The use of student-engaged CBPAR in higher education contexts prioritizes the insights and lived experiences of college students from marginalized backgrounds, critically examines power dynamics and privileges, and facilitates collaborative efforts towards achieving equitable transformations (Anderson, 2017). This work aims to provide evidence-based advocacy to support for HMoob students at PWIs. Furthermore, this study utilizes auto-ethnography as a reflective process, documenting the researcher’s experiences and contextualizing them within the action research framework (Smolarek et al., 2021). Through this approach, the study examines systems of oppression and informs advocacy efforts to empower HMoob American students.

Institutional profile of case site: UW–Milwaukee

The UW–Milwaukee (UWM) is a public urban Research 1 (R1) university in Milwaukee, Wisconsin, that serves the largest population of HMoob students in the state. UWM stands out as an R1 university for their remarkably high 89% acceptance rate, making it a more inclusive, less selective research institution, serving students from a wide range of backgrounds. The demographic characteristics of the student population are presented in Figures 1-4.

According to National Center of Educational Statistics (NCES) data for 2023, UWM has a retention rate of 72% for first time students seeking Bachelor’s degrees, indicating that first time students return the following fall to continue their studies at the institution. The 4-year on-time graduation rate was 21% for full-time degree-seeking students, which is lower than the national average of 49%. The 6-year graduation rate at UWM is 49%. The 2024 tuition and fees for undergraduates seeking Bachelor’s degree are about \$22,862 for Wisconsin residents. Based on financial aid data reported for the 2022-2023 academic year, approximately 89% of first-year, first-time degree-seeking students receive some sort of financial aid. Eighty-three percent of them receive some sort of grant or scholarship aid, with 31% of them receiving the Federal Pell Grant. As for student aid loans, approximately 47% of UWM undergraduate students take federal student loans with an average amount of \$5,104 per year, and 9% of them take other student loans with an average amount of \$12,326 per year. In regards to financial aid packages, UWM offers more grants and scholarship aid for first-year, first-time degree-seeking students than returning undergraduate students since only 66% of all undergraduates actually receive any grants and scholarship aid, compared to the 83% of the prior. In consequence, returning undergraduate students take a higher average of federal student loan amount of \$6,303. With the university front-loading aid for new students, there is less aid offered to returning students which makes it more difficult for continuing students to

afford college. While UWM may be an open access R1 university, the limited financial aid offered makes it an expensive investment for students, especially minoritized students who come from low-income backgrounds.

Figure 1-4. Demographic and academic characteristics of case site at UW Milwaukee

Figure 1. Student Enrollment Status

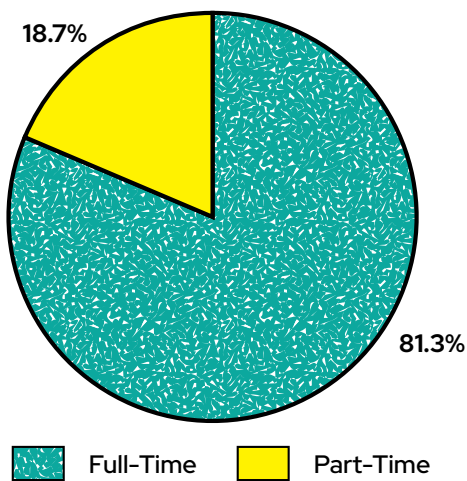


Figure 2. Gender

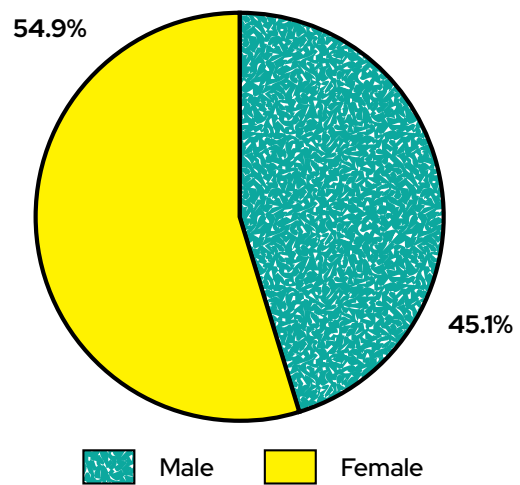


Figure 3. First Generation Status*

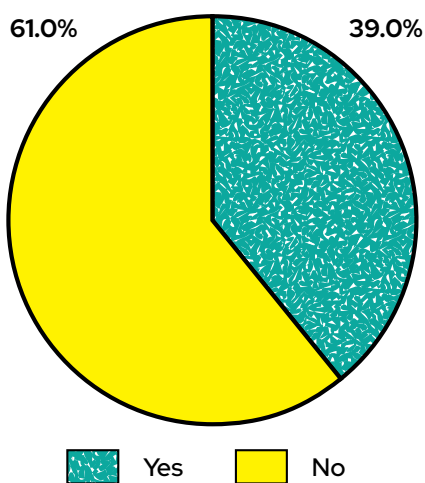
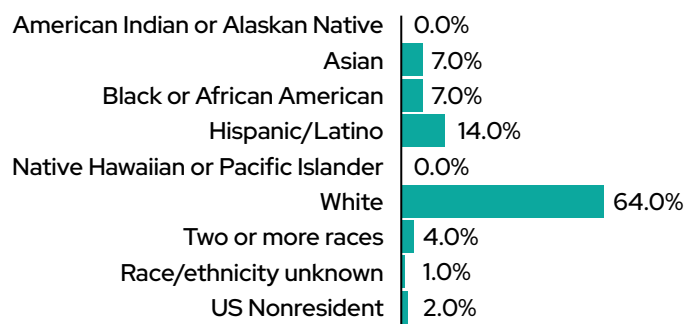


Figure 4. Race/Ethnicity



* First generation data were extracted from UW Milwaukee Fall 2023 and includes their campuses from Washington County and Waukesha.

Data collection and analysis

The Paj Ntaub research team designed a survey to study the demographic and academic characteristics and college experiences of HMoob students in UW System Universities. We received lists of institutional emails for HMoob-identified students from eleven of the 13 universities in the UW System (UW–Eau Claire, UW–Green Bay, UW–La Crosse, UW–Madison, UW–Milwaukee, UW–Oshkosh, UW–Platteville, UW–River Falls, UW–Stevens Point, UW–Stout, and UW–Whitewater). In the spring of 2023, we sent a recruitment email with an invitation to participate in the survey and a link to an online survey. Students reviewed an online consent form approved by the UW–Madison IRB with information about the research and their rights as a research participant. Students who completed the survey received a \$15 gift card for participating in the research. After the original recruitment email, three follow-up email reminders were sent to non-responders (the survey was open for 2 months).

At the end of the survey, research participants were asked if they would be willing to be contacted to conduct a 75-minute audio recorded interview about their experiences in college (in person or online). Students who did not respond to this request were contacted an additional two times. The research team developed a semi-structured interview protocol, which asked questions about students' immigration history, family and high school background, academic and social experiences during college, barriers to college success, and financial status. Participants reviewed an IRB approved consent form and were given the opportunity to ask questions prior to consenting to participate in the interview; students who completed the interview received a \$40 gift card for participating in the research.

Analysis. The survey data was used to compile descriptive statistics of the demographic and academic characteristics of HMoob students in the UW System and at UW–Milwaukee. Audio recorded interviews were transcribed, open coded to identify themes, and systematically coded using MaxQDA software (Saldaña, 2021); which also allowed us to compare the experiences of STEM and non-STEM students and those STEM students who received and did not receive WiscAMP support.

Sample Demographic from Survey Data

In the fall semester of 2023, our team conducted a survey to investigate HMoob American undergraduate experiences and their demographic and academic characteristics within the UW System. The survey asked a series of questions to study the relationships between demographic characteristics, institutional factors, and academic experience. The survey had a response rate of 40 percent with a sample size of 669 HMoob American degree-seeking undergraduate students from a total of 11 institutions at the UW System. The top three institutions with the most total responses were UW–Madison (n=186, 27.8%), UW–Milwaukee (n=170, 25.4%), and UW–Green Bay (n=68, 10.2%).

As shown in Table 1, the survey sample showed that HMoob undergraduate students in WI comprises of a young population aged 25 and under (n=610, 91.1%), and consists of a high proportion of first-generation students (n = 407, 67.5%). The sample size is also predominantly female (n= 433, 64.3%), which is consistent with the UW System data (Smolarek et al, 2019) that there are more HMoob female students enrolled, however the difference is much greater in our survey respondents. Furthermore, there was an overall sample size of 81 students (12.1%) who reported as queer-identifying. Approximately 35 students (5.2%) reported that they have a disability, but 19 students (2.8%) preferred not to answer.

The top four broad academic programs for HMoob students within the UW System are health professions (n=109, 15.7%), social sciences (n=94, 14.2%), arts and humanities (n=87, 10.5%), and biological sciences (n=81, 12.1%), which suggests that HMoob students do have a high interest in STEM pathways. The high enrollment in STEM aligns with the UW Systems data (Smolarek et al, 2019) that show the top four majors as Psychology, Computer Science, Nursing, and Biology. Approximately 53.9 percent (n=138) of HMoob students transferred from community colleges or two-year universities, indicative of the first-generation

college status; and 27.1 percent (n=71) transfer from other four-year colleges.

For HMoob students at UW–Milwaukee, there was also a significant number of students who transferred from community colleges (n=28, 57.1%), correspondingly with the high proportion of first-generation students (n=110, 70.5%). Additionally, the rate of HMoob transfer students from four-year universities at UW Milwaukee was much higher (n=21, 42.9%) than the transfer rate for HMoob students within the overall UW System (n=71, 27.7%). This suggests that HMoob American students may have experienced institutional and academic barriers at private colleges around the Milwaukee area (e.g., Marquette University, Carroll University) or other UW System Universities such as the flagship UW–Madison, and thus transferred to UW–Milwaukee to continue their education. Health professions was the top category of majors at UW–Milwaukee for HMoob students. Following health profession was finance (n=30, 17.6%), business (n=22, 12.9%), and arts and humanities (n=18, 10%).

Table 1: Demographic and academic characteristics comparing survey participants from UW–Milwaukee with other UW System Universities in the state; and the interview for this study

Measure	Survey Data for UW System n(%)	Survey Data for UWM n(%)	Interview Data for UWM n(%)	Non-STEM n(%)	STEM n(%)	STEM with WiscAMP n(%)
SAMPLE	669 (100.0%)	170 (25.4%)	32 (100.0%)	16 (50.0%)	11 (34.4%)	5 (15.6%)
AGE						
<i>25 and under</i>	610 (91.1%)	157 (92.4%)	28 (87.5%)	14 (87.5%)	10 (90.9%)	4 (80.0%)
<i>26 and over</i>	59 (8.9%)	13 (7.6%)	4 (12.5%)	2 (12.5%)	1 (9.1%)	1 (20.0%)
GENDER						
<i>Female</i>	433 (64.7%)	104 (61.2%)	19 (57.6%)	8 (50.0%)	7 (63.6%)	3 (60.0%)
<i>Male</i>	227 (33.9%)	63 (37.1%)	12 (36.4%)	6 (37.5%)	4 (36.4%)	2 (40.0%)
<i>Non-binary</i>	9 (1.3%)	3 (1.8%)	2 (16.7%)	2 (12.5%)	–	–
SEXUALITY						
<i>Heterosexual</i>	568 (84.9%)	146 (85.9%)	N/A	N/A	N/A	N/A
<i>Queer Identified</i>	81 (12.1%)	17 (10.0%)	N/A	N/A	N/A	N/A
<i>Prefer not to answer</i>	20 (3.0%)	7 (4.1%)	N/A	N/A	N/A	N/A
DISABILITY STATUS						
<i>Yes</i>	35 (5.2%)	5 (2.9%)	N/A	N/A	N/A	N/A
<i>No</i>	615 (91.9%)	158 (92.9%)	N/A	N/A	N/A	N/A
<i>Prefer not to answer</i>	19 (2.8%)	7 (4.1%)	N/A	N/A	N/A	N/A
STUDENT STANDING						
<i>First Year</i>	164 (24.5%)	43 (25.3%)	5 (15.2%)	1 (6.3%)	5 (45.5%)	–
<i>Second Year</i>	150 (22.4%)	32 (18.8%)	9 (27.3%)	4 (25.0%)	2 (18.2%)	1 (20.0%)
<i>Third Year</i>	144 (21.5%)	40 (23.5%)	7 (21.2%)	5 (31.3%)	1 (9.1%)	1 (20.0%)
<i>Fourth Year</i>	145 (21.7%)	41 (24.1%)	10 (30.3%)	3 (18.8%)	1 (9.1%)	1 (20.0%)
<i>Five year or more</i>	66 (9.9%)	14 (8.2%)	1 (3.0%)	3 (18.8%)	2 (18.2%)	1 (20.0%)
<i>Alumni</i>	–	–	1 (3.0%)	–	–	1 (20.0%)

Measure	Survey Data for UW System n(%)	Survey Data for UWM n(%)	Interview Data for UWM n(%)	Non-STEM n(%)	STEM n(%)	STEM with WiscAMP n(%)
TRANSFER STATUS						
<i>Two-year community or technical college</i>	138 (53.9%)	28 (57.1%)	4 (12.5%)	2 (12.5%)	1 (9.1%)	1 (20.0%)
<i>Four-year college or university</i>	71 (27.7%)	21 (42.9%)	9 (28.1%)	5 (31.3%)	3 (27.3%)	-
FIRST GENERATION						
Yes	407 (67.5%)	110 (70.5%)	24 (75%)	12 (75%)	10 (90.9%)	3 (60.0%)
No	196 (32.5%)	46 (29.5%)	8 (25%)	4 (25.0%)	1 (9.1%)	2 (40.0%)
ACADEMIC PROGRAM						
<i>Arts and Humanities</i>	87 (13.0%)	18 (10.5%)	4 (12.5%)	4 (25.0%)	-	-
<i>Biological Science</i>	81 (12.1%)	17 (10.0%)	5 (15.6%)	-	2 (18.2%)	3 (60.0%)
<i>Business</i>	67 (10.0%)	22 (12.9%)	6 (18.8%)	6 (37.5%)	-	-
<i>Education</i>	26 (3.9%)	4 (2.4%)	2 (6.3%)	2 (12.5%)	-	-
<i>Engineering</i>	39 (5.8%)	14 (8.2%)	-	-	-	-
<i>Finance</i>	74 (11.1%)	30 (17.6%)	3 (9.4%)	3 (18.8%)	-	-
<i>Health Professions</i>	105 (15.7%)	34 (20.0%)	10 (31.3%)	-	8 (72.7%)	2 (40.0%)
<i>Math and Computer Science</i>	49 (7.3%)	11 (6.5%)	1 (3.1%)	-	1 (9.1%)	-
<i>Physical Science</i>	1 (0.1%)	-	-	-	-	-
<i>Social Science</i>	94 (14.1%)	11 (6.5%)	1 (3.1%)	1 (6.3%)	-	-
<i>Other majors</i>	15 (2.2%)	4 (2.4%)	-	-	-	-
<i>Undecided</i>	31 (4.6%)	5 (2.9%)	-	-	-	-

Results from the Paj Ntaub interview study at UW–Milwaukee

HMoob students in both STEM and non-STEM degree programs faced challenges and had experiences that impacted their education in the following areas: feeling a diminished sense of belonging on account of (1) competitive or alienating disciplinary cultures in their academic programs; (2) academic advising that was sometimes experienced as inconsistent, superficial, transactional, or alienating, in part due to high advisor turnover; (3) challenges obtaining academic and career mentorship; and (4) financial challenges which frustrated and distracted from academic and extra-curricular engagement. Research indicates that experiences of campus belonging are associated with academic persistence and attainment (Hurtado & Carter, 1997), which is also the case for minoritized students who face barriers to college success (Brady et al., 2020; Museus et al, 2017). Thus, research to identify the factors that impact belonging for minoritized students is paramount to leveraging student success. In this section, we document each of these themes and identify the impact of the supports and resources provided to HMoob students in STEM programs at UW–Milwaukee.

Disciplinary cultures

Many HMoob students expressed feelings of social isolation in the predominantly white spaces associated with their academic majors, which was consistent for students in both STEM and non-STEM program. Even for students who enjoy the academic content of their program, social isolation can be a challenge, as this student in a humanities major explains:

I've had a harder time just because the diversity, as a humanities major, it's very low. It's a lot of like, it tends to be a lot of white people. And so, I'm used to being the only Asian American, or just person of color in general, in my courses. Luckily, I've been able to meet another friend, and she's also HMoob. So, it's been really nice to connect with her.

HMoob students often described struggling to make friends or establish peer-support systems, finding it difficult to integrate into established groups of students in their major. Fellow HMoob or other minoritized students may associate together to provide protective and mutual support in such cliquish environments, as the student in the humanities program described. Unfortunately, her HMoob friend in the program, who also enjoyed her classes and professors, had declining mental health over her first year of college on account of repeated—often microaggressive, sometimes explicit and overt—post-pandemic Anti-Asian racism, from peers both in her major, in her on-campus job, and in her residence hall. She decided to depart college and return home after the completion of her first year.

HMoob students in STEM programs faced particular challenges connecting with peers first because of a lack of fellow students of color, but also because of the competitive and individualistic disciplinary culture of their programs, with students vying for top grades, opportunities, and resources to advance selective STEM pathways. “People always wanna like work super hard and always wanna one up another person” as a biological sciences student shared about the “negative aspects” of the STEM disciplinary culture.

This competitive nature of the peer culture amplifies feelings of isolation and self-doubt, as one HMoob student attempting to pursue the radiology program explains:

I think it just made me like compare myself to them a lot and it kind of just brought me down because like someone could be saying that they have this grade or they're doing all this and all that to get into the program and then like, I see what I'm doing is like I am trying, but then it's like I'm not where they are. And so that kind of just made me feel like if I was to apply to the program, I wouldn't get in.

This student describes how the competitive and socially isolating nature of STEM disciplinary cultures can push minoritized students out of STEM programs, either by choosing not to apply to selective programs or by being redirected by advisors to less competitive programs. This student experienced extensive STEM pushout, first at UW–Oshkosh and then at UW–Milwaukee: from nursing to biology to radiology and finally to their current major of information sciences.

When I was talking to my advisors about the program, they weren't very helpful in the classes that I should take or things that I could do to better my chances of getting into the program. And so, I think that was one thing, and that happened at both Oshkosh and Milwaukee with the advisors. And I just thought that the program was too competitive. Basically, I didn't fit in with it... I didn't apply for [the radiologic program].

Students in the WiscAMP program at UW–Milwaukee are grouped into a cohort comprised of students from the same or similar majors and provided with a peer mentor who facilitates regular peer support groups. The students we interviewed described how the peer mentor–led groups fostered as sense of community among fellow minoritized students and supported a strong sense of belonging that, in turn, bolstered their academic persistence. One WiscAMP student, who was first a peer mentee and now a peer mentor for underclassmen, describes the importance of the support, guidance, and community-building provided:

But being a peer mentor ... it was fun. I enjoy it. I know that these students are STEM, it's easy for me to talk to them. I just felt like I enjoyed my peer mentor meetings and meeting my mentees in WiscAMP. I enjoyed having that little like group, there was just like maybe 6 of us total. I get to share them my experience of like...with what it was like taking chemistry, or my experience in STEM. If I know some STEM stuff, I can share those STEM opportunities to other students. ... So, sharing ideas with them, it's like group therapy kind of.

Peer mentorship for minoritized STEM students facilitates belonging and provides protective support in the context of hostile, isolating, or competitive disciplinary cultures. One student described the profound impact of their peer mentor's experience that he shared in the group: "They engage in a conversation that felt meaningful, and they told the story of how they struggled, so that you know I don't feel like I'm the only one." Through sharing testimonies, discussing challenges and experience, sharing advice and information about resources, and encouraging one another, the peer mentorship program supports as sense of belonging (that is, STEM–student–of–color solidarity) that may be a protective counter to non-inclusive disciplinary cultures.

Academic Advising

Effective academic advising plays a crucial role in students' overall success (Drake, 2011; Mu & Fosnacht, 2019). A positive advising experience fosters student achievement by providing guidance, clarifying

academic pathways, and addressing challenges. HMoob students in our sample described such positive and supportive advising experiences, for example, a first-year Kinesiology major reported that their advisor was helpful in his academic planning: "Yeah, I think that my advisor is really helpful. ... He was able to determine which classes I should take versus like... another class, and just comparing schedules next to each other, which I really liked." Participants consistently reported that their academic advising experiences were instrumental in shaping their academic planning.

Both STEM and non-STEM students, however, reported being challenged and frustrated by the problem of high advisor turnover. A student majoring in Human Resources explained their experiences with inconsistent advising:

My advisors weren't that consistent throughout the years, because there must have been a bad overturn rate for advisors. So, it was kind of like not the most satisfying, having one advisor tell you this, versus another advisor telling you this for your requirements. And like what credits you have and credits you don't have. But yeah, fortunately like, for the past year and a half, I've had the same advisor. Each year, it always seems to change. You get the email, 'your current advisor is leaving. If you have any questions, you can reach out to this person in the meantime.' It's like, you know, you get slow responses. They're not really available. All those sorts of things.

Students encounter significant challenges in accessing timely and substantive guidance on account of high advisor overturn. Students in the WiscAMP program had disciplinary advisors, as well as the benefit of a consistent advisor associated with the WiscAMP program, who could ensure that students didn't experience gaps in support because of advisor turnover; and who could identify students who were struggling academically and provide targeted advice, resources, and supportive encouragement. One student in the WiscAMP program who is a biology major explained the impact of her advisor's encouraging and supportive engagement:

So, I feel like with my academic advisor, I was really close with her. I feel like if it wasn't for her then I really wouldn't have gone for pharmacy like she is just so sweet and so like patient with me with all the questions I had, and why not? I met with her at least once every semester, and like, I think, with her it was nice as well, cause she kept me in the loop for everything like all the supplemental grants that I can apply for, she gave me all tea and what not so we really bonded.

Both STEM and non-STEM students need and benefit from consistent and encouraging advising, but this desirable support is thwarted by frequent advisor turnover. The WiscAMP program advising provides additional support in cases when students struggle with inconsistent advising, or when they face major academic or other challenges that threaten to stall their academic progress.

Mentorship

Mentorship is an important supportive educational practice for STEM students (Dahlberg & Byars-Winston, 2020) and for minoritized college students (Estrada et al., 2018), associated with increased belonging, self-efficacy, and STEM identity for college students (Apriceno et al., 2020; Atkins et al.,

2021). The majority of the students interviewed for this study did not have an academic mentor, and lacked knowledge about the importance of mentorship for their academic and career development. The few students in the sample who received mentorship from faculty in their programs found it to be highly supportive and impactful. One student received mentorship in the forms of emotional support, academic guidance, and advocacy from two faculty members, when she was struggling to gain admittance to the selective nursing program, and her academic advisor was not available or supportive during the process. Another student in the School of Business received mentorship from her campus employment supervisor, which caused her to change the focus of her academic and career plans:

I worked a lot with my supervisor, and that was when I made the change to being an HR [Human Resource] major too. Just got to learn a lot like, behind the scenes, how she helps students transition to their first-year experience. I also really enjoyed the work I was doing, working with assessments and planning programs for students. And like, I think she also made work seem like, a lot of fun and impactful. A big thing for me is to see how like, influential she was with her role... So, I got a lot of mentorship through her. She's one of my top mentors here throughout my time ... [and] the reason why I switch to this career path.

While few of the students who we interviewed received formal academic mentorship at UW–Milwaukee, it is clear from this example how impactful having a mentor—a faculty mentor or, in this case, a mentor who was the student’s work supervisor—can be supporting, encouraging, and empowering of students’ academic and career success.

In addition to peer-mentorship program, students in the WiscAMP are assigned a faculty mentor, which positively impacted their academic experiences at UW–Milwaukee. Students received guidance and encouragement from their mentors, conducted research on their mentors’ projects, and were guided and supported in accessing high impact career development opportunities, such as internships. These two students emphasize the social-emotional care provided by their faculty mentor, which was especially helpful during challenging times.

Student 1: [S]o WiscAMP, my faculty adviser, he is like just a professor I went to. It's just a good support system to know that a different teacher who isn't bound to me by my academics, but through a program, cares about me. [It's been] informative, encouraging, and very supportive during like heavier days. Like, yeah, it's just like a lot of heart-to-heart moments with them. So, it means a lot to me.

Student 2: My faculty mentors, they actually just encouraged me that there are some days where you know you're gonna feel like things aren't going right, but ... they reassure me that they know they've had similar experiences to, and that they just had to push through it.

Financial precarity

Concern about financial precarity and student debt was a major factor that impacted the educational experiences and decision-making for both STEM and non-STEM students in our sample. Furthermore, over half of those interviewed for this study were first-generation college students, and thus, they were the first in their family to navigate the process of seeking financial aid support. Many of the students

interviewed for this study lived at home with their family, and provided financial support to their family—ranging from regular financial contributions such as paying for a portion of the groceries or a utility bill, to occasionally extensive financial support in cases of financial or other family emergencies. One student was struggling academically in her math classes, which was compounded by financial stress from working fulltime, needing to support her family financially, and increasing student debt—so she decided to take a year off of school while she worked to support her family:

I was really struggling with my math courses. So, that's why I took it off.... It's just like a lot of things going on top of that, I feel like I was struggling a lot with like finances because my parents would ask me like, "Oh, can you help us?"... I just feel like with school expenses I had to take care of that too. I mean, last time I checked [my school debt], it was 14K, but I'm pretty sure it went up.

Students also often provided regular in-kind family support, such as tutoring or babysitting younger family members while the parents' work. While HMoob students viewed these expectations of mutual family care and financial supports as reciprocal, expected, and unburdensome, they also recognized that large amounts of such family care and paid work was an obstacle to achieving the grades needed to access competitive programs. One student on a pre-med track was in the process of exploring other academic and career options because they felt that they could only earn the high grades needed in STEM courses if they had the financial resources to not work and dedicate themselves to full-time studying.

I would like to get a like at least AB in organic chem. I would like to end off my biology with Bs. Like at least like a high B, maybe a low A... I've come to that realization that if I want those grades, I would need to take a year off and just work and save and work full time and save all of that money. And then, I would be able to do that as I pay it all upfront, and then focus on school exclusively. But again, I don't think that's just doable.

This experience highlights the role of financial precarity and stress in the STEM pushout process, by increasing the time needed for paid work to meet basic needs, distracting and limiting the time available to study for challenging STEM gatekeeping courses.

Students in the WiscAMP program receive financial support in the form of a stipend, which helps to ameliorate the impact of financial precarity on academic performance by reducing the amount of paid work required to meet basic needs or other costs associated with college. As one student in the program explained:

It was nice to have that financial support because, like, it kind of just made me work less. I don't really know when the paychecks came in, but I knew that I had like a 200-stipend coming in because I was a WiscAMP member. But now that I know that I'm a WiscAMP mentor, peer mentor, I'll be getting like a \$300 check coming in at some point. And so maybe, like the week the check comes in, I'm like cool, I don't need to work the next week then or it just decreases the amount of hours ahead of work.

In addition to the impact of the stipend for students' ability to focus on their academics, the WiscAMP programs provides financial support for student to participate in important high impact practices, such as presenting undergraduate research at academic conferences.

Discussion and Implications

Although there are studies indicating an overrepresentation of Asian Americans in STEM fields (Wolfgram et al., 2024), the heterogeneity of the different ethnic groups of Asian Americans has been inadequately addressed, in particular there are questions of how minoritized Asian Americans experience and navigate post-secondary STEM pathways. As a consequence of model minority stereotyping, there is a lack of support for minoritized Asian Americans in STEM, especially for HMoob and other Southeast Asian students. On the other hand, a STEM intervention program such as WiscAMP at UW–Milwaukee employs non-NSF supplemental funds to include HMoob American students and other Southeast Asian students in their program. Through the additional support given from WiscAMP—peer mentorship, faculty mentorship and financial assistance—Southeast Asian students are able to navigate through their academic pathways and utilize these resources to further their persistence in STEM.

In this paper, we draw upon our survey of HMoob college students in the UW System (Table 1), which was conducted in Spring of 2023 (n=669; 40% response rate) to better understand the experiences and needs of HMoob college students at UW–Milwaukee. The data indicates a high rate of transfer into UW Milwaukee from community colleges (n=28, 57.1%). The data also revealed institutional pushout of HMoob college students due to the alarmingly high rate of transfer from four-year universities (n=21, 42.9%), indicating that students may enroll at UW–Milwaukee after facing barriers from more selective universities such as Marquette University and UW–Madison. Nonetheless, there is a high interest in STEM, particularly in health professions, among HMoob students in the UW System and at UW–Milwaukee.

In addition to our survey data, we analyzed the interviews with STEM, non-STEM, and WiscAMP STEM HMoob students—to examine their experiences and how STEM program interventions impact their academic pathways. The findings indicates that both STEM and non-STEM students found creating community in their majors challenging due to the competitive nature inherent to their programs, which can result in self-isolation and self-doubt in their abilities. In terms of academic advising, while some found the guidance helpful to their academic planning, others encountered inconsistencies due to frequent advisor turnover. Furthermore, for both STEM and non-STEM students, many did not have mentors or lacked the knowledge and networks needed to obtain one; but once they have acquired a mentor, it was a generally positive and impactful experience. In addition, these students face financial precarities, often juggling part-time or full-time jobs to sustain themselves through college and to assist their families. As a consequence of the lack of adequate financial support, students allocate a significant amount of time to work, thereby limiting their time available for academic engagement.

On the other hand, our findings also highlight that within the WiscAMP program at UW–Milwaukee, which include some HMoob students, stable and consistent support from peer and faculty mentorship and advising proved effective support for students and encouraged persistence in their academic programs. Furthermore, these interventions promote a sense of belonging for students, increasing their commitment to their academic program. The financial resources provided by WiscAMP enabled student to remain academically engaged, supporting a positive sense of belonging on campus.

Conclusion

Overall, our findings demonstrate that policies and interventions that assist Southeast Asian American students such as HMoob Americans have a high impact on their experiences by providing social-emotional and academic support systems while alleviating some financial burdens. Thus, federal policies that exclude Asian Americans from the definition of “underrepresented minorities” (URM) should be adjusted to include minoritized Asian Americans such as HMoob and other Southeast Asian Americans. This includes the URM definitions for NSF and NIH funded programs designed to encourage the STEM attainment of racially minoritized students. The evidence presented in this report is that there is a need for additional supports for minoritized Asian Americans in STEM programs—and that such supports may be effective at facilitating belonging and encouraging academic persistence.

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