

University of Wisconsin Madison

Madison, Wisconsin

When we began our journey, we were seeking to increase the number and diversity of students in the state of Wisconsin who graduate with BS degrees in STEM disciplines. Data from the University of Wisconsin (UW) and Wisconsin Technical Colleges (WTC) Systems told us that most Wisconsin students from backgrounds underrepresented in STEM began their college careers at two-year institutions and that the number who successfully transferred and completed a four-year college degree was low. The primary strategies we used to achieve our goal of increasing the success of STEM transfer students were as follows:

- 1 To provide professional development for faculty, staff, and peer leaders across the two- and four-year institutions to increase their ability to support transfer students;**
- 2 To provide professional development directly to transfer students from the start of their two-year college experience, through to graduation from their four-year institution; and**
- 3 To identify structural barriers to successful transfer and change policies at the state and institutional levels and to remove those barriers.**

During our journey, we encountered and overcame several challenges. The first was the news that one of our primary partners on the project, the two-year colleges within the UW System, were going to be integrated with four-year universities around the state. That meant that they would no longer be able to collaborate with us, so we shifted our efforts to focus on the WTC System and expanded our partnerships to include all five institutions that at that time offered liberal arts transfer (LAT) programs. Today, all 16 WTC institutions have since been granted permission to offer LAT programs, so we've expanded to partner with all of them.

We discovered that the history of transfers and relationships between institutions could be complicated, especially when leadership changes occurred. Therefore, we prioritized building and repairing relationships with STEM faculty, staff, administrators, and transfer professionals across the institutions through cross-institutional transfer initiatives. Though COVID travel limitations made it difficult to bring partners together, meeting online actually made building and maintaining cross-institutional relationships more feasible. It allowed us to more easily bring leaders from across the partnerships together, so they could learn from one another. Their discussions also prompted us to develop a framework with shared goals, to align and guide the work across all the partnerships, and, with shared values, to address common biases and misconceptions that the project revealed about transfer students.

We learned from surveying transfer students that one of the greatest obstacles they faced was transferring their credits, and that there was no documentation about the classes required to transfer into a STEM major. This resulted for many students in a loss of credits or a transfer of some credits as elective rather than major courses, as well as extended timelines for the completion of STEM degrees. To address this hurdle, we designed transfer pathways that

**Beyond Access to *Success* in Wisconsin:
Creating Flexible Pathways to STEM Degrees for 2- to 4-Year Transfer Students**

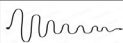
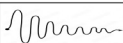
Shared Values:			
- We believe supporting success for 2- to 4-year transfer students is important. - We believe 2-year institutions can prepare students for success in STEM majors at 4-year institutions. - We believe transfer students from 2-year institutions can successfully complete STEM majors at 4-year institutions.			
	Aim 1: Professional Development Programming	Aim 2: Student Development Programming	Aim 3: System Policy Changes
Connect	Build community with others who support STEM transfer students to create a state-wide network of transfer professionals.	Build pathways for STEM transfer students to join communities that increase their social capital and develop their sense of belonging.	Build community across institutions to catalyze policy and procedure changes that support 2- to 4-year transfer student success.
Reflect	Reflect on individual experiences, identity, and biases, and address how these aspects of one's self influence interactions with and support of transfer students.	Reflect on and build transfer student STEM identity through peer leader role modeling and opportunities to increase STEM self-efficacy and sense of belonging.	Review, reflect on, and revise current policies and procedures to better support STEM transfer student success.
Learn	Gain awareness and understanding of the needs and characteristics of STEM transfer students.	Identify, curate, and make accessible resources that increase the cultural capital that STEM transfer students need to navigate institution specific expectations and opportunities.	Share and learn from the portfolio of successful STEM transfer policy and procedure models at institutions across the state.
Act	Apply evidence-based strategies & policies to remove barriers and address challenges to STEM transfer student success.		



identified the courses needed for six STEM majors at all WTC and UW System institutions. Designing system-wide pathways was difficult because institutions have unique course numbering systems, and system-to-system transfer agreements do not exist. We have had to identify each course at each institution and ask the STEM faculty at those institutions to review and endorse the pathways. This work is ongoing.

We also learned that it was very difficult to track transfer students' movement, academic progress, and outcomes between the WTC and UW System institutions. To address this challenge, we asked our partnership team leaders to identify the data they needed, then developed a prototype data dashboard. We presented the prototype dashboard and a request for data to system administrators, who responded positively and will be collaborating to update their data-sharing agreement and make the data we identified available.

Materials for faculty, staff, adviser, and student development were created by our partnership teams and are now available upon request. Materials include case studies and activities for faculty and staff instructors and advisers to raise awareness of the challenges that transfer students face, as well as just-in-time activities and workshops to support transfer students.

Goals	Lessons Learned
AIM 1: Create a common faculty professional development curriculum for 2- and 4-year faculty.	 A single curriculum does not meet the faculty development needs. UW and WTC System institutions have very different cultures and needs.
AIM 1: Embed transfer specific advising information into existing institutional professional development programs.	 Greatest need for transfer advising professional development is for inter-institutional connections.
AIM 2: Create pre- and post-transfer seminar courses to support transfer students.	 Students don't want to pay for extra courses and prefer flexible, just-in-time workshops.
AIM 2: Build STEM transfer student communities to increase social capital and sense of belonging.	 - Offer multiple, easy opportunities to join; schedule regular check-ins. - Virtual resources broaden access, but students appreciate face-to-face opportunities.
AIM 3: Create system-to-system transfer agreements.	 Policies and procedures support transfer agreements between individual institutions, not systems.
AIM 3: Ask System Administration Offices to create system-wide STEM transfer pathways.	 - University tenure-track faculty must approve baccalaureate academic programs. - Involving hierarchical networks early will expedite discovery of structural barriers.
AIM 3: Ask all 16 WTCs institutions to offer common set of 18 STEM Pathway courses	 Enrollment/Faculty/Budget limitations are hurdles for most WTCs schools.



After COVID travel restrictions were lifted, our partners across the state were eager to meet and work together. We collaborated with UW and WTC administrative offices to host the first Wisconsin Transfer Conference, which brought together attendees from all the UW and WTC System institutions.

Our priority now is to sustain our journey once the funding from HHMI ends, specifically at UW-Madison, Madison College, and the UW and WTC system offices. We are pursuing these avenues to ensure that the progress we've made is maintained and continues:

- Madison College has integrated the STEM course pathways into their advising system, and UW Madison recognizes the pathways in their guaranteed transfer agreement with Madison College.
- The UW System has adopted and branded the STEM course pathways as the Wisconsin STEM Passport program; they presented this program to the board of regents, which approved it.
- At UW-Madison and Madison College, the Wisconsin Institute for Science Education and Community Engagement (WISCIENCE) and the STEM Center will continue to offer programming for transfer students. In addition, the Madison Teaching and Learning Excellence Program, the Office for Undergraduate Advising, and the Center for Excellence in Teaching and Learning will continue to offer professional development related to transfer students for faculty and staff.
- The UW and WTC Systems have committed to continuing to collaborate on organizing and hosting the WI Transfer Conference and on building and maintaining a transfer data hub based on our data dashboard prototype.

Our reflections on our experiences to date have allowed us to identify several lessons learned, including the following:

- A single professional development curriculum does not meet the needs of both two-year and four-year faculty, who operate in very different cultures and must meet very different expectations.
- The greatest need for transfer advisers is interinstitutional connections.
- Students don't want to pay tuition for transfer transition courses and prefer flexible, just-in-time workshops.
- Students need multiple, easy opportunities to join activities, and they benefit from regular check-ins.
- Virtual resources broaden access for students, but students appreciate face-to-face activities.
- Existing policies and procedures do not support system-to-system transfer agreements.
- University tenure-track faculty must approve all modifications to academic programs.
- Involving system-level stakeholders early expedites the discovery and resolution of structural barriers.
- Most institutions are facing challenges related to enrollment, faculty, and budget limitations.
- It is important to find collaborators who simply need permission and the resources to do work they already want to do.
- It is important not to be afraid to change course if things aren't working.

Grant-Derived Dissemination Products

Branchaw, J.L., Butz, A., and Mirus, K. "Using Idea Flow Theory to Understand Levers for Change in 2- to 4-year STEM Transfer Between Wisconsin Public Institutions," Alumni Career Services Network and Network of STEM Education Centers Transforming Institutions conference, June 13, 2023.

Branchaw, J.L. "Beyond Access to Success in Wisconsin: Creating Flexible Pathways to STEM Degrees for 2- to 4-year Transfer Students," Wisconsin STEM Transfer Conference, May 30, 2023.

Mirus, K. "The Wisconsin STEM Passport: Course Concentration Pathways," Wisconsin STEM Transfer Conference, May 30, 2023.

Branchaw, J.L., Mirus, K., Theisen, C., and Butz, A. "Innovation Session: Connect, Reflect, Learn: A framework to unite and guide professionals working to advance 2- to 4-year STEM transfer students across public higher education systems in Wisconsin," American Association of Colleges and Universities Transforming STEM Higher Education conference, November 5, 2022.