ASPIRED Project's Impact on Gender Equity in STEM: Establishing the Foundation for Institutional Transformation

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In Fall 2019, a large public urban research university in the southern US conducted a university-wide climate survey (University of Memphis, 2019). The results of this survey identified four problems for STEM women faculty: implicit bias, isolation, ambiguity and inequality in career advancement, and poor work-life-family integration. These four issues led the University of Memphis to apply for an NSF ADVANCE Adaptation Grant to bring evidence-based strategies from other ADVANCE institutions to address these problems and begin to change the institutional climate and increase gender equity in recruitment, hiring, retention, and advancement for STEM women faculty.

The purpose of this paper is to describe the interventions that comprised the ASPIRED project (Adaptations for Sustainable Policies and Increased Recruitment Excellence in Diversity) at the University of Memphis and report evidence of their effectiveness. In what follows, we (1) explain the problems identified by STEM women faculty; (2) discuss the approach to organizational change that guided our efforts; (3) describe our interventions and summarize assessments of those interventions; (4) report the results of subsequent university-wide surveys on STEM department climates and dual careers; (5) conclude by discussing lessons learned.

Problems Identified by STEM Women Faculty

Problem 1: Implicit Bias

Implicit bias refers to subconscious attitudes that inform how we think and behave toward others. It creates barriers to inclusion, performance, engagement, and ultimately, innovation (Greenwald & Krieger, 2006). Implicit bias training can reduce such bias, especially when it emphasizes overcoming implicit bias as normative (Duguid & Thomas-Hunt, 2015; Girod et al., 2016). In our 2019 University-wide climate survey, women at all faculty levels reported experiencing one or more aspects of implicit bias, which affected their job satisfaction

and desire to remain at University of Memphis.

Problem 2: Isolation

In the 2019 University-wide survey, STEM women faculty at University of Memphis felt more excluded from an informal professional and social network in their department compared to men. They reported that they felt professionally and personally isolated within their departments, consistent with other findings that women in male-dominated fields feel marginalized and socially isolated (CAWMSET, 2008). There were few formal opportunities on campus to network with other women faculty, and many women faculty felt isolated. Traditional approaches to reducing isolation have tended to focus on helping women adapt rather than change the cultures and organizations that isolate them in the first place (Ely & Myerson, 2000).

Problem 3: Ambiguity and inequality in career advancement

Women in traditionally male-dominated settings have often been excluded from the information loop for advice and professional development opportunities (Catalyst, 2008; Eagly & Carli, 2007). In the 2019 University-wide climate survey, STEM women faculty at University of Memphis reported men were more likely than women to receive helpful career advice from colleagues. STEM women also agreed that white faculty were more likely than faculty of color to receive helpful career advice from colleagues. Black women faculty felt that men receive preferential treatment in the areas of recruitment and promotion. Tenured associate professor level STEM women reported they had less understanding of the criteria and less confidence in the process for promotion to full professor compared to other ranks. STEM women further reported they received mixed messages from colleagues regarding the requirements for promotion.

Problem 4: Poor work-life-family integration

Lack of awareness of implemented programs at University of Memphis was one of the identified problems that women faculty across the University of Memphis experienced. Women faculty were not familiar with the University of Memphis's paid parental leave and family friendly policies (implemented in 2017), and only 13% of women respondents were familiar with these policies. More specifically, in the University-wide climate survey, STEM women reported feeling uncomfortable raising family responsibilities when scheduling departmental obligations. 2017 University-wide climate survey data also exhibited inconsistencies in the communication, understanding, and implementation of existing policies. Research has demonstrated that parental leave improves employee satisfaction, and increases work productivity and employee loyalty (Hollenshead et al., 2005).

Approach to Organizational Change

To address these four problems, a team of STEM faculty, social scientists, and theatre artists, working with university administrators, focused on organizational change, rather than changing women STEM faculty to adapt to their organizations. Our framework was based on Correll's (2007) "small wins approach." This approach recognizes that gender equity in organizations is achieved through incremental successes, leading to broader changes as organizations build momentum and leaders see evidence of their effects. Correll's approach includes five steps 1) educate; 2) diagnose bias; 3) develop tools; 4) intervene; and 5) evaluate. Because of the "simultaneity" of gender, race, class, and other identities (Holvino, 2010), at each step, we considered the intersection of gender and other identities in organizational inequities. We educated faculty, chairs, and others on implicit bias and barriers to career success; created tools and interventions for existing resources and policies; implemented mentoring, networking,

and support strategies for STEM women's career success; and intervened to influence the creation of new policies.

ASPIRED Tracks

The ASPIRED project was broken into three tracks, each addressing different objectives: UM-Intersect, UM-Connect, and UM-Integrate. The specific goals and objectives for each track are described in Table 1.

Table 1.

ASPIRED Tracks, Objectives, and Targets

Objectives	**Targets**
UM-Intersect Decrease implicit bias and foster inclusive, culturally responsive work environment.	Increased awareness and understanding of implicit bias. Increased knowledge of how to improve diversity and create an inclusive, culturally responsive, and respectful work environment. Increased access to campus resources for new hires and faculty.
UM-Connect Decrease isolation and increase women faculty's social (e.g., sense of community) connections.	Increased networking across departments and colleges. Increased interdisciplinary and community collaborations. Improved sense of belonging. Understood tenure and promotion policies, resources, opportunities. Increased prospects for career advancement (e.g., obtaining tenure, promotion, administration position).
UM-Integrate Enhance work/life integration.	Understood, transparent, consistent hiring protocol. Positive views of dual career hires. Increased awareness of parental leave and family friendly policies. Increased participation for social networking and family friendly events. Increased satisfaction with work-life-family integration.

UM-Intersect

The goal of UM-Intersect was to decrease implicit bias and foster inclusive, culturally responsive work environments. UM-Intersect was comprised of STRIDE workshops, interactive theatre sketches, department climate improvement grants, and STEM women story maps.

STRIDE. Adapted from the University of Michigan, STRIDE (Strategies and Tactics for Recruiting to Improve Diversity and Excellence) is a one-hour, interactive workshop designed to provide attendees with strategies and tactics that will maximize the likelihood that well-qualified and diverse candidates will be identified and recruited for faculty positions at University of Memphis. Each workshop is co-facilitated by faculty members of the STRIDE committee. During the workshop, participants learn about best practices to ensure a fair and equitable search process and to minimize the influence of implicit bias. The workshops are intended for search committee chairs, search committee members, and department heads. The STRIDE workshop partners with the Office of Institution Equity at University of Memphis to train faculty serving on a search committee.

Interactive Theater Sketch-based Implicit Bias Training. Adapting an intervention from the University of Michigan, the ASPIRED team created a theater troupe called Tiger-Lilly Collective (TLC), named for Lilly Ledbetter, the plaintiff in the Supreme Court case for equal pay for women that eventually prompted the Lilly Ledbetter Fair Pay Act of 2009. Interactive theatre sketches illustrating implicit bias in an everyday faculty meeting and a promotion and tenure meeting were developed, offering a unique mode for communicating the science of implicit bias for STEM faculty who are not experts in social science. This begins with a process of research to translate technical information for non-expert audiences and then creating engaging sketches to portray individuals' experiences (LaVaque-Manty et al., 2007). We

endeavored to avoid a specific problem endemic to implicit bias training: that it can foreground individual, rather than systemic or institutional, explanations for gender and racial disparities and create a potential barrier to enacting systemic change (Pritlove et al., 2019).

These sketches were designed to focus the audience's attention to "dynamics that are often ignored or difficult to discern in daily life" and invite audiences to reflect on what they observed and actively co-construct potential outcomes or solutions (Armstrong & Braunschneider, 2016). The goal of the sketches was to catch audiences off-guard and illustrate in real time the role that implicit biases can play in interactions among STEM faculty. After the sketches were performed, audience members were invited to offer their reflections and discuss potential solutions, focusing on systemic and procedural interventions. TLC performed these sketches for University of Memphis administrators (chairs and deans) and for the broader university community.

Department Climate Grants. ASPIRED offered $1,000 grants in academic years 21-22 and 22-23 to all STEM departments to implement climate improvement projects based on the results of STEM department survey data and their own departmental needs. In 2021, the mathematics department invited two distinguished female statisticians to present colloquia. Center for Earthquake Research and Information (CERI) has formed a women's student support group, called Seismo Girls. They used ASPIRED funding during the 2021-22 AY and in the summer of 2023 to support a seminar series composed of established women scientists who then met with the women students. In Spring 2023, the Engineering departments combined their funds to host an emotional intelligence workshop through the company OKA (www.oka-online.com). This workshop included an assessment tool, Emotional Quotient Inventory 2.0.(Online EQ-i 2.0® Assessment), administered online in advance to all workshop participants, followed by a

four-hour program.

STEM Women Stories StoryMap. STEM Women Stories StoryMap (2022) is an exciting new online resource that maps the locations and research interests of women in STEM. This innovative tool allows STEM women to connect with each other, showcase their work, and inspire the next generation of women in STEM. Each participant in the STEM Women Stories StoryMap adds their location, research interests, lab information, photos, videos, audios, and other relevant information. This builds a rich and dynamic resource that reflects the diversity and breadth of expertise within the STEM community. We believe that this resource will be an invaluable tool for connecting with other women in STEM locally and nationwide, promoting collaboration, and raising awareness of the important work that we do.

UM-Connect

UM-Connect provided mentoring, networking, and professional development opportunities to address the isolation and ambiguity and inequality in career advancement expressed by STEM women, especially those in mid-career, within the 2019 University-wide climate survey.

Mentoring. Adapted from models at the University of Texas-El Paso (UTEP), strategies included a peer mentoring experience for mid-level career women faculty, whereby STEM senior level faculty and administrators served as mentors, and mid-level career faculty served as mentees. Mentor training consisted of a one-day workshop followed by a three-week online training with collaborative discussions and problem-based scenarios to socialize both the mentors and mentees to the peer mentoring process. The first group consisted of three mentors and four mentees. All the mentors were professors, some in senior level administration positions. Two of the mentees were associate professors and two were assistant professors. The second

group consisted of four mentors and six mentees. All the mentors were professors (including one department chair and one associate professor). The mentees consisted of five assistant professors and one instructor.

UM-Connect Mentoring Survey. In a pre/post survey given to participants in the peer mentoring experience, respondents (mentor N=3, mentee N=2) reported satisfaction with their career goal progress, professional development opportunities, promotion opportunities, and sense of STEM community at the University of Memphis prior to entering the mentoring program; however, satisfaction ratings in these areas for both the mentor and mentees were higher after participation in the program. Similarly, mentors and mentees rated their mentoring competencies across all areas as high to moderate prior to participating in the mentoring program. However, after participation in the program, competency ratings for both the mentor and mentees improved.

STEM Speaker Series. Also adapted from UTEP, ASPIRED offered a STEM speaker series featuring a different industry leader who talked about their STEM career path and the benefits and challenges of their position and shared strategies for success. Each group involved 20- to 30-minute presentations and a workshop to emphasize areas such as developing leadership skills, successfully obtaining promotion and tenure, and collaborating to develop competitive grants. These presentations were broadcast through Zoom and uploaded to the ASPIRED website (2020) and YouTube (2022). One hundred and thirty-eight faculty attended these luncheons, and respondents to a survey given to attendees indicated high satisfaction with these events.

UM-Integrate

UM-Integrate provided internal grants to UM faculty and consisted of a policy awareness and development initiative to address the lack of work-life-family integration expressed by

STEM women faculty within the climate survey.

Dual Career Policy. In Fall 2021, the Dual Career Policy Taskforce began meeting to develop recommendations for a dual career policy and corresponding services. Adapted from a model at the University of Rhode Island, the Dual Career Policy Taskforce worked with the Provost's Office to formalize recommendations for programs and policies related to dual-career services. The task force conducted a needs assessment and investigated comparable institutions' policies and programs (such as University of Virginia, University of Montana, and University of Alabama) related to dual career. The Faculty Senate unanimously approved the improvement of the current policies to accommodate a dual-career assistance program to aid in prospective partner placement.

In 2000, results of the most comprehensive dual career policy study demonstrated that nearly 50% of research institutions offered dual career policies (Wolf-Wendel et al., 2000). Over the past two decades, this percentage has exponentially increased (Blake, 2020; Kelly et al., 2017; Mora et al., 2018). Dual-career academic couples make up a large proportion of the U.S. professoriate, approximately 40% of full-time faculty being partnered with another scholar (Schiebinger et al., 2008). Nearly one-third of BIPOC (Black, Indigenous, and People of Color) faculty are partnered with another faculty member (Blake, 2020; Schiebinger et al., 2008). University administrators cite adopting dual career and remote hiring policies and practices as necessary to recruit and retain women and BIPIOC faculty (Schiebinger et al., 2008; Wolf-Wendel et al., 2004). The top reason women in academic couples reject university offers is that their partner did not find satisfactory employment nearby, while this is not as prominent a reason for men in academic couples (Schiebinger et al., 2008). Women earn 40% of doctorate degrees, yet hold approximately 25% of tenured or tenure-track positions because they are often the

trailing spouse, cannot uproot their families to take tenure-track positions, and do not take tenure-track and leadership positions due to lack of flexible and remote work options. Dual career policies assist institutions in recruiting and retaining talented women and BIPOC faculty.

UM-Integrate Grants. Adapted from models at the University of Michigan and University of Wisconsin-Madison, UM-Integrate provided individual grants to directly support faculty's professional advancement. Faculty at any career stage could apply for a small grant targeting one of three areas 1) research; 2) professional development; or 3) work-family integration. Grants were awarded to support faculty in promising new areas of research, restarting research after time away, providing support during significant family events (such as childbirth or death in family), providing seed funding for early career faculty so that they may be more competitive when pursuing larger-scale funding, and providing funding for professional development that will enhance faculty's career trajectory. Applicants were required to provide a synopsis of the research project or professional development program and budget as well as the reason that they would benefit from the award. Integrate grants were capped at $5,000 and were awarded annually in Years 2 and 3 of the ASPIRED project. ASPIRED funded three grants annually while the College of Arts and Sciences funded one grant and the College of Engineering funded one grant. Criteria for the grant included a well-developed research or development plan likely to propel faculty (especially women) to further career success and/or a strong evidence of need, based on each applicant's statement. While all faculty were eligible, special effort was made to ensure female faculty were aware of the grant opportunity and encouraged to apply.

UM-Integrate Grant Recipient Survey. In a survey given to Integrate grant recipients, respondents (N=8) reported improved satisfaction with their career goal progress, professional

development opportunities, and promotion prospects. While their perceptions that work interference with family slightly increased, their strain-based work interference with family and family interference with work decreased. Moreover, when asked about the program, all the respondents agreed or strongly agreed that they would again apply for the grant and that the program was overall beneficial. All the respondents agreed or strongly agreed that the proposal application, implementation of the grant, and final reporting for the grant was easy.

UM-Intersect, Connect, and Integrate: STEM Department Climate Survey

Method

To evaluate STEM departmental climates over the course of the ASPIRED project, and for each project and topic area identified in response to the 2019 University-wide climate survey, the STEM Department Climate survey was distributed online to STEM faculty and staff at University of Memphis, once in Spring 2021 and once in Fall 2022. All faculty and staff in the following STEM departments were invited to participate: Biological Sciences, Biomedical Engineering, Chemistry, Civil Engineering, Computer Science, Earth Sciences, Electrical Engineering, Engineering Technology, Mathematical Sciences, Mechanical Engineering, and Physics and Materials Science. In Spring 2021, a total of 77 faculty/staff completed the STEM Department Climate survey, yielding an approximately 30% response rate. Again in Fall 2022, the STEM Department Climate survey was administered for two weeks in late October/early November and during the administration, there were two reminder emails sent. Eighty-eight faculty/staff completed the survey, for an approximately 35% response rate. Respondent demographics are reported in Table 2. The survey items were developed based on a review of literature and other NSF ADVANCE climate surveys and each was measured with a 5-point Likert type scale (1=strongly disagree; 5=strongly agree). Below we report the percentage of

respondents agreeing or strongly agreeing with each item, organized by ASPIRED's objectives and targets for each track (see Table 1). We also report statistically significant differences by gender and race for the Fall 2022 STEM Department Climate survey.

Table 2.

STEM Department Climate Survey Demographics

	Spring 21		**Fall 22**	
Gender Identity	n	%	n	%
Man	42	54.5	50	56.8
Woman	34	44.2	36	40.9
Non-binary/non-conforming	1	1.3	-	-
Preferred not to identify	-	-	2	2.3
Sexual Orientation				
Heterosexual or straight	74	96.1	82	93.2
Not listed above / non-conforming	2	2.6	4	4.5
Gay or Lesbian	1	1.3	2	2.3
Race				
White	55	71.4	61	69.3
Black or African American	11	14.3	9	10.2
Asian	9	11.7	12	13.6
Other/ Not Reported	2	2.6	6	6.8
Disability				
No	73	94.8	84	95.5
Yes	2	2.6	3	3.4
Prefer to Not Answer	2	2.6	1	1.1

Results

Results for the Fall 2022 STEM Department Climate survey follow below by project and topic area 1) *UM-Intersect:* Decrease implicit bias and foster inclusive, culturally responsive work environment; 2) *UM-Connect:* Decrease isolation and increase women faculty's social

(e.g., sense of community) connections.

Following the results of the STEM Department Climate Survey are the results of the Dual-Career Survey addressing Project Area 3) *UM-Integrate:* Enhance work/life integration.

UM-Intersect.

Awareness and Understanding of Implicit Bias. Three items measured awareness of implicit bias (see Table 3). In both surveys, the majority of respondents agreed or strongly agreed that all individuals have implicit biases that may influence their judgments and behaviors, whereas respondents tended to agree less they themselves have implicit biases (with less than half agreeing in Fall 2022). Relatively few respondents agreed that implicit bias was a major issue or concern in their department. In Fall 2022, women and men did not significantly differ on these perceptions. However, white faculty (M=3.28, SD=1.31, Mdn=4) tended to agree more that they personally have implicit biases compared to faculty of color (M=2.33, SD=1.04, Mdn=2; U=480.5, z=-3.184, p=.001). Otherwise, there were no statistically significant differences.

Table 3.

Percentage of Respondents who Strongly Agree/Agree with Statements Regarding Implicit Bias

Items	**Spring 2021**		**Fall 2022**	
	All (*n* = 77)		All (*n* = 88)	
	Strongly Agree/Agree	*Mdn*	*Strongly Agree/Agree*	*Mdn*
All individuals have implicit biases that may influence their judgments and behaviors.	67.6%	4	65.9%	4
I have implicit biases that may influence my judgments and behaviors.	55.9%	4	40.9%	3

Implicit bias is a major issue or concern in my department.	24.7%	3	18.2%	2

Promote diversity and cultivate an inclusive, culturally responsive, and respectful work environment.

Diversity and Inclusiveness. Four items measured perceptions of diversity and inclusiveness in STEM departments (see Table 4). In both surveys, a large majority of respondents agreed or strongly agreed that their departments were committed to diversity. More participants tended to agree that their department has diverse faculty in Fall 2022 compared to Spring 2021. Likewise, they tended to agree more that their department had diverse leadership in Fall 2022 compared to Spring 2021. Large majorities in both surveys agreed or strongly agreed that their departments were accepting of all individuals. In Fall 2022, women faculty (M=4.05, SD=0.99, Mdn=4) tended to agree less than men (M=4.48, SD=0.86, Mdn=5) that their departments accepted all individuals (U=681.0, z=-2.50, p=.01). Faculty of color (M=4.19, SD=0.92, Mdn=4) tended to agree more than white faculty (M=3.59, SD=1.15; Mdn=4) that their department has diverse faculty (U=571.5, z=-2.41, p=.02). Otherwise, there were no statistically significant differences.

Table 4.

Percentage of Respondents who Strongly Agree/Agree with Statements Regarding Diversity

Items	**Spring 2021**		**Fall 2022**	
	All (*n* = 77)		All (*n* = 88)	
	Strongly Agree/Agree	*Mdn*	*Strongly Agree/Agree*	*Mdn*
My department is committed to diversity.	72.8%	4	78.4%	4

My department has diverse faculty.	44.2%	3	69.3%	3
My department has diverse leadership.	44.2%	3	63.7%	3
My department is accepting of all individuals [not hostile].	79.3%	4	85.2%	4

Discrimination. Six items asked about discrimination based on gender, race, and other group memberships (see Table 5). Relatively few people agreed that discrimination on these categories occurred in their departments or that they had experienced discrimination personally. Gender discrimination was the category that respondents most agreed occurred in their departments. In Fall 2022, women tended to agree more than men that discrimination occurs in their departments and that they have personally experienced discrimination (comparisons are shown in Table 6). Faculty of color and white faculty did not differ significantly in their responses on any items.

Table 5.

Percentage of Respondents who Strongly Agree/Agree with Statements Regarding Discrimination

Items	**Spring 2021**		**Fall 2022**	
	All(*n* = 77)		All(*n* = 88)	
	Strongly Agree/Agree	*Mdn*	*Strongly Agree/Agree*	*Mdn*
Gender discrimination occurs within my department.	24.7%	2	13.6%	2
I have experienced gender discrimination in my department in the last two years.	16.9%	2	9%	1

Racial discrimination occurs within my department.	10.4%	2	11.2%	2
I have experienced racial discrimination in my department within the last two years.	6.5%	2	5.6%	1
Discrimination against members of other groups occurs within my department.	7.8%	2	6.8%	2
I have experienced discrimination based on my membership in other groups in my department. [please specify]	6.5%	2	5.7%	1

Table 6.

Agreement with Statements about Discrimination by Gender (Fall 2022)

Items	**Men (n=50)**			**Women and non Gender Identifying (n=38)**			**U**
	M	*SD*	*Mdn*	*M*	*SD*	*Mdn*	*p*
Gender discrimination occurs within my department.	1.68	.891	1	2.66	1.192	3	<.001
I have experienced gender discrimination in my department within the last two years.	1.38	.725	1	2.34	1.236	2	<.001
Racial discrimination occurs within my department.	1.72	.970	1	2.34	1.072	2	.004
I have experienced racial discrimination in my department within the last two years.	1.44	.812	1	1.95	.985	2	.006
Discrimination against members of other groups occurs within my department. [please specify]	1.66	.895	1	2.29	1.037	2	.002

I have experienced discrimination based on my membership in other groups in my department in the last two years. [please specify] (6)	1.48	.789	1	2	1.040	2	.011

Hostile and Intimidating Behavior. Three items asked about hostile and intimidating behaviors occurring in departments and personal experience with such behavior (see Table 7). Relatively few respondents agreed that hostile behavior occurs in their departments or that they had experienced such behavior. The majority of respondents agreed that they would feel safe reporting hostile and intimidating behavior. Women faculty (M=3.47, SD=1.39, Mdn=4) tended to agree less than men (M=3.96, SD=1.34, Mdn=5) that they would feel safe reporting (U=727.00, z=-1.97, p<.05). Faculty of color (M=1.93, SD=1.24, Mdn=1) tended to agree less than white faculty (M=2.44, SD=1.27, Mdn=2) that hostile and intimidating behaviors occur in their departments (U=607.50, z=-2.03, p=.04). Otherwise, there were no statistically significant differences.

Table 7.

Percentage of Respondents who Strongly Agree/Agree with Statements Regarding Hostile and Intimidating Behavior

Items	**Spring 2021**		**Fall 2022**	
	All (*n* = 77)		All (*n* = 88)	
	Strongly Agree/Agree	*Mdn*	*Strongly Agree/Agree*	*Mdn*
Hostile and intimidating behavior occurs within my department.	20.8%	2	21.6%	2
I have experienced hostile and intimidating behavior in my department in the last two years.	24.7%	2	17.1%	2

I would feel safe reporting hostile and intimidating behavior if it occurred in my department.	66.3%	4	66.9%	4

UM-Connect

Sense of Belonging and Community. Four items asked about respondents' sense of belonging and community in their departments. By and large, respondents agreed that they belonged in their departments and that their departments are collaborative and supportive (see Table 8). There were no statistically significant differences by gender or race in the Fall 2022 survey.

Table 8.

Percentage of Respondents who Strongly Agree/Agree with Statements Regarding Belonging and Community

Items	**Spring 2021**		**Fall 2022**	
	All (*n* = 77)		All (*n* = 88)	
	Strongly Agree/Agree	*Mdn*	*Strongly Agree/Agree*	*Mdn*
My department is collaborative. [not individualistic]	66.3%	4	65.9%	4
Individuals in my department are supportive of one another. [not unsupportive]	70.2%	4	71.6%	4
I belong in my department.	66.3%	4	71.6%	4
I feel supported by others in my department.	67.6%	4	69.3%	4

Tenure and Promotion Policies, Resources, Opportunities. Eight items asked about perceptions of workloads and tenure and promotion requirements (see Table 9). Most respondents agreed that their workloads were reasonable, although a minority agreed that workload was equitable in their department in Spring 2021. The majority of respondents also

agreed that tenure and promotion requirements are reasonable, clear, and applied consistently. Women tended to agree less than men with respect to tenure and promotion policies (see comparisons in Table 10). Faculty of color and white faculty did not differ in their responses.

Table 9.

Percentage of Respondents who Strongly Agree/Agree with Statements Regarding Workload and Tenure and Promotion

Items	**Spring 2021**		**Fall 2022**	
	All (*n* = 77)		All (*n* = 88)	
	Strongly Agree/Agree	*Mdn*	*Strongly Agree/Agree*	*Mdn*
Workload				
Workload is equitable in my department.	39%	3	54.5%	4
My overall workload is reasonable.	61.1%	4	63.6%	4
Tenure & Promotion				
The tenure and promotion requirements are reasonable.	65%	4	67.1%	4
The tenure and promotion standards are applied consistently across my department.	54.6%	4	63.7%	4
The tenure and promotion process is free from gender bias in my department.	57.2%	4	68.1%	4
The tenure and promotion process is free from racial bias in my department.	58.5%	4	65.9%	4

The expectations for tenure and promotion are consistently communicated to me and my colleagues.	62.4%	4	63.6%	4
The expectations I need to meet for tenure and promotion are clear to me.	57.2%	4	62.5%	4

Table 10.

Agreement with Statements about Tenure and Promotion by Gender (Fall 2022)

Items	**Men (n=50)**			**Women and non Gender Identifying(n=38)**			**U**
	M	*SD*	*Mdn*	*M*	*SD*	*Mdn*	*p*
Tenure & Promotion							
The tenure and promotion requirements are reasonable.	4.02	1.040	4	3.47	1.033	3	.005
The tenure and promotion standards are applied consistently across my department.	3.98	1.040	4	3.39	1.128	3	.006
The tenure and promotion process is free from gender bias in my department.	4.36	.875	5	3.50	1.109	3	<.001
The tenure and promotion process is free from racial bias in my department.	4.38	.878	5	3.39	1.128	3	<.001
The expectations for tenure and promotion are consistently communicated to me and my colleagues.	3.92	1.192	4	3.39	1.175	3.50	.019
The expectations I need to meet for tenure and promotion are clear to me.	3.94	1.168	4	3.39	1.104	3	.009

Career Advancement. Fourteen items asked about respondents' perceptions of support for career advancement for women, faculty of color, and their own personal advancement (see Table 11). Most respondents agreed that women and men, and faculty of color and white faculty, are supported equally in their departments. The majority of respondents also agreed that they were personally supported in their career advancement (except for personally receiving mentorship in Spring 2021). In Fall 2022, women tended to agree less on three items related to gender and two items related to faculty of color (see Table 12). There were no statistically significant gender differences on responses to personal career advancement. Faculty of color and white faculty did not statistically differ on any career advancement items.

Table 11.

Percentage of Respondents who Strongly Agree/Agree with Statements Regarding Career Advancement

Items	**Spring 2021**		**Fall 2022**	
	Strongly Agree/Agree	*Mdn*	*Strongly Agree/Agree*	*Mdn*
Women				
Women and men have equitable networking opportunities in my department.	62.4%	4	75%	4
Women's career advancement is supported in my department.	67.6%	4	76.1%	4
Women and men have the same opportunities to seek career advancement in my department.	63.7%	4	77.3%	4
Women and men have equitable access to resources for career advancement in my department.	70.2%	4	79.5%	4
Women and men have equitable access to mentorship for career advancement in my department.	66.3%	4	77.3%	4

Faculty of Color				
Faculty of color are supported in career advancement in my department.	55.9%	4	73.9%	4
Faculty of color and white faculty have equitable networking opportunities in my department.	50.7%	4	71.6%	4
Faculty of color and white faculty have the same opportunities to seek career advancement in my department.	58.5%	4	78.4%	4
Faculty of color and white faculty have equitable access to resources for career advancement in my department.	58.5%	4	77.2%	4
Personal				
I receive sufficient networking opportunities in my department.	59.6%	4	63.7%	4
My career advancement is supported within my department.	66.3%	4	68.2%	4
I have the opportunities I need to seek career advancement within my department.	55.9%	4	62.5%	4
I receive resources for career advancement within my department.	57.2%	4	53.4%	4
I receive mentorship for career advancement in my department.	44.2%	3	54.5%	4

Table 12.

Agreement with Statements about Career Advancement by Gender (Fall 2022)

Items	**Men (n=50)**			**Women and non Gender Identifying (n=38)**			**U**
	M	*SD*	*Mdn*	*M*	*SD*	*Mdn*	*p*
Women's career advancement is supported in my department.	4.26	0.91	4	3.74	1.56	4	.037
Women and men have the same opportunities to seek career advancement in my department.	4.28	0.83	4	3.74	1.11	4	.012
Women and men have equitable access to resources for career advancement in my department.	4.30	0.74	4	3.76	1.15	4	.025
Faculty of color are supported in career advancement in my department.	4.18	0.85	4	3.63	1.15	4	.018
Faculty of color and white faculty have equitable access to resources for career advancement in my department.	4.22	0.84	4	3.74	1.13	4	.035

Summary of Open-Ended STEM Department Climate Survey Responses. The Fall 2022 STEM Department Climate Faculty & Staff survey included several open-ended questions to capture qualitative responses across UM-Intersect and UM-Connect. The responses (N = 54) to these questions are summarized below.

When asked about the overall climate in their department, over half of the respondents felt the overall climate in their department was positive, friendly, and collaborative. About one third of respondents felt their department's overall climate was in need of improvement or even hostile. A few respondents also mentioned the climate was unbalanced for tenured or tenure-

track faculty versus those untenured or non-tenure track.

When asked about the climate for women in their department, again over half of the respondents felt that the climate was positive and supportive. About one third mentioned it was neutral or acceptable, and about one quarter felt it was hostile or unfair towards women. Several respondents also noted the women were the minority in their department such that it was unbalanced in that aspect as well.

When asked about the climate for people of color in their department, about two-thirds felt it was friendly, positive, and supportive. About one quarter mentioned it was an acceptable environment or was "better than others." Again, it was mentioned that the department was unbalanced in terms of the fact that fewer people of color were represented in their department. One respondent noted that their department had hired several faculty of color but "could not retain [them] because of greater resources provided at competing institutions," including more financial support and better infrastructure. Another respondent noted that it felt clear from others that "diversifying their department to better reflect the student population was not a priority."

When asked about the ASPIRED Departmental Grant funds that were awarded, about one-third of respondents commented that their departmental grant funds had been used to provide a DEI speaker or host a DEI seminar or activity. However, around two-thirds of respondents answered that they did not know if funds had been awarded or how they had been used.

UM-Integrate

UM-Integrate Dual Career Survey. An additional survey on dual career policies was distributed to STEM Department faculty in Spring 2022. Twenty-six faculty responded to this survey (demographics were not collected). The results of this survey were used to help inform

the development of new dual career policies at University of Memphis. Seven items asked respondents about spousal/partner considerations, hybrid and flexible work policies, and spousal/partner assistance (see Table 13).

While no faculty member was currently considering leaving the University of Memphis, two (7.7%) noted that their spouse or partner was considering alternative employment, which would require them to leave the university. Five (19.2%) faculty respondents were living in a location separate from their spouse or partner due to careers. Five faculty have declined job offers (19.2%) and four considered declining their University of Memphis position (15.4%) due to lack of services or employment for a spouse or partner.

Almost half of faculty respondents (12, 46.2%) noted that they would have requested a remote or hybrid position to better accommodate their spouse/partner dual careers when hired if it were available and the job responsibilities allowed for the accommodation. Additionally, three (11.5%) additional faculty who did not need to consider spouses or partners at the time of hire would have requested this accommodation if they would have had a spouse or partner to consider. Thus, more than half of respondents (57.7%) noted that this was an important accommodation for the University of Memphis to offer. More than half of respondents (53.8%) reported the need for dual career services at the University of Memphis.

Table 13.

Faculty Responses to Items on Dual Careers

Items	**No**		**Yes**		**No partner**	
	n	%	n	%	n	%
Spousal Consideration						
Have you declined a position due to lack of spouse/partner job	21	80.8	5	19.2		

placement?						
Did you consider declining your University of __ position due to lack of spouse/partner job placement assistance?	18	69.2	4	15.4	4	15.4
Are you currently a dual career couple living in separate locations?	19	73.1	5	19.2	2	7.7
Have you considered leaving your University of __ position due to lack of employment for your spouse/partner? *	24	92.3	0	0	2	7.7
Remote, Hybrid, and Flexible Work						
When you were hired, would you have requested a remote or hybrid position to better accommodate you and your spouse/partner dual careers, if it was available and your job responsibilities allowed for the accommodation?	12	46.2	9	34.6	5*	19.2
When you were hired, would you have requested a flexible schedule to better accommodate your and your spouse/partner dual careers, if it was available and your job responsibilities allowed for the accommodation?	10	38.5	12	46.2	4**	15.4
Spousal/Partner Assistance						
When you were hired, would you have requested assistance with spouse/partner job placement, if it was available?**	11	42.3	11	42.3	4**	15.4

Note. In the open-ended responses two faculty, however, noted that their spouses were considering out of town positions, which may require them to quit. Three respondents didn't have a spouse/partner, but would have requested this accommodation. When spousal assistance would have been requested, six (23.1%) of the respondents would have requested a faculty position and three (11.5%) a staff position within the university for the spouse. Twelve (46.2%) would have requested assistance with finding a position external to the university. Five (19.2%) found this question N/A.

Additionally, respondents were asked which dual career services would have been most useful to them (see Table 14). By far, the most useful service would have been a staff person dedicated to spouse/partner job placement.

Table 14.

Responses to Preferred Dual Career Resources

Responses	**n**	**%**
Career Services Person dedicated to spouse/partner job placement (whether internal or external to the university)	20	76.9
__ area job boards	6	23
Funds to help create a new position for a partner/spouse	4	15.4
Community Career Network	4	15.4
Guide for dual career faculty seeking academic appointment	2	7.7
Other	3	11

Discussion

The ASPIRED project achieved some tangible wins over the course of the project. It spearheaded the development of new dual career policies at the University of Memphis, and it implemented STRIDE workshops and a handbook that are offered to clarify employment procedures and educate about best practices for hiring committees. The mentoring program, STEM speaker series, and Integrate grants created opportunities for women STEM faculty to receive important career advice, networking across campus, and support for their work/life balance. Department climate activities were offered to improve the overall climate. The interactive theatre sketches were performed for university leaders and for broader audiences across campus, enhancing education about implicit bias. The STRIDE workshop was institutionalized by partnering with University of Memphis's Office of Institutional Equity to be offered as a replacement option to the University's current search committee training. Integrate

grants have been institutionalized by receiving additional funding from the College of Arts and Sciences and the College of Engineering to fund more grants. The Dual Career Program is a critical accommodation within the broader landscape of organizational support for partnered faculty members. It plays a crucial role in promoting diversity and inclusion within organizations. These programs acknowledge the needs of faculty members who have partners with their own career aspirations and facilitate the recruitment and retention of talented individuals who might otherwise be deterred from accepting positions due to concerns about their partner's career prospects. As University of Memphis moves towards institutionalizing Dual Career policies and leveraging HR tracking for assessment of utilization, University of Memphis has the opportunity to further enhance its ability to attract, retain, and support diverse talent.

Even as we saw positive impacts from these "small wins," our STEM department climate surveys revealed ongoing challenges. Women STEM faculty, compared to their male colleagues, tended to see their departments as less accepting and feel less safe reporting hostile and intimidating. They also tended to perceive and to experience more discrimination in their departments, to see their departments' T&P policies and opportunities for career advancement to be less equitable. These disparities between women's and men's perceptions show the need to continue and scale up interventions such as the ones launched by ASPIRED. We also saw a trend toward fewer STEM faculty agreeing that they have implicit biases that may affect their judgment or behavior, suggesting a need for greater education in this area. The pandemic necessitated a rapid shift to remote work for the ASPIRED team. This transition posed challenges for in-person collaborations, such as mentoring, STEM networking groups, STRIDE workshops, and TLC theater performances. With schools and daycare facilities closed or

operating at limited capacity, many faculty members, particularly women, have had to assume additional caregiving responsibilities for children or other family members. Balancing these responsibilities with work commitments h impacted the time and energy available for ADVANCE grant-related activities. There was more virtual participation to STEM networking groups and STRIDE workshops were strictly virtual. Initial theater performances were done with masks to comply with pandemic regulations. ASPIRED Integrate grants have helped women faculty with their professional development and work-life integration with the increased stress, anxiety, and burnout due to uncertainties related to the pandemic, concerns about their health and safety, and challenges associated with remote work and caregiving responsibilities. Integrate Grants were an important implemented strategy to support the wellbeing and professional development of women faculty during this challenging time.

In conclusion, the COVID-19 pandemic has starkly illuminated the pre-existing vulnerabilities faced by women faculty in academia, particularly concerning work-life integration and professional development. However, amidst these challenges, ASPIRED initiatives have emerged as beacons of support and resilience. They have not only provided immediate relief but also laid the groundwork for long-term systemic changes towards a more equitable and inclusive academic environment at University of Memphis. As we navigate the post-pandemic landscape, it is imperative to institutionalize such initiatives to ensure that the strides made towards gender equity through the ASPIRED project remain enduring pillars of excellence and innovation in STEM.

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