

WOMEN IN TECHNOLOGY (WIT): A PARADIGM FOR WORKING TOWARD SYSTEMIC CHANGE IN SCIENCE, TECHNOLOGY, ENGINEERING AND MATH (STEM) EDUCATION AND EMPLOYMENT

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Abstract — *Seeing the need for systemic change in science, technology, engineering and math (STEM) education, as well as facing the challenge of developing a qualified technology workforce, the Maui Economic Development Board, Inc. (Maui, Hawaii) created The Women in Technology (WIT) Project to focus on addressing gender equity issues directly, working toward sustained climate change throughout the pipeline from education to workforce. Our process for instituting this program serves as a community-based model to effect systemic change for gender parity.*

Index Terms — *Gender-equity recruitment, Industry-led model, Rural community workforce development, Workplace diversification*

BACKGROUND

Maui County has historically been economically dependent on tourism and agriculture. Twenty years ago this community saw the need for economic diversification, launching a new vision for Maui and giving birth to the Maui Economic Development Board (MEDB) to shepherd the vision. As with many communities during this same time period, Hawaii saw an opportunity for high technology to be a key driver in its desired diversification strategy. The statewide consensus to move the economy toward technology resulted in progressive legislation including appropriations for tech incubation facilities, instituting foreign trade zones, business attraction subsidies and tax incentive packages for qualified high technology companies. However, Hawaii in general, and Maui in particular, faced greater challenges than some mainland communities trying to develop high tech communities. For example, Maui did not have a four-year university, so many of our students were faced with leaving the island, often to the Mainland, to gain post-secondary education. This further resulted in those graduates accepting

employment on the Mainland and not returning to their island home. Investigation of the infrastructure required to sustain a high tech community revealed the gaps that Maui would have to address. Maui faced two major challenges: providing a qualified local workforce and addressing the extreme under-representation of women in Maui's developing tech industry.

RESEARCH/KNOWLEDGE NECESSARY: "DO YOUR HOMEWORK"

MEDB wanted a clear understanding of future employment needs and the challenges faced in meeting those needs – to assure that workforce development strategies would be industry-led. Beginning at the source, MEDB conducted employer interviews and surveys exploring current skill set needs, recruitment challenges, and workforce gender analysis. Consultants conducted personal interviews with 50 Maui County employers. Interviews were conducted with the CEO, senior management level of the respective companies purposely designed to cement partnerships, to build trust, and to garner buy-in when discussing affirmative action hiring goals. Employer selection was concentrated in the high technology industry, however, the sampling was broadened to probe the emerging technology skill set needs in the hotel/visitor industry; healthcare field; financial, utility and real estate sectors. These businesses not usually associated with the technology industry, but having technology related positions, were reviewed to assess training needs to move entry-level workers into next level tech-related positions. Additional research that focused

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on science and technology employers was reviewed (looked at) to assess:

- Recruitment and training programs affecting female representation in the workforce,
- Positions coming on line in the next 24 months,
- Longer term forecasting of jobs over next five years, and
- Credentials/competency needed to fill positions.

Employers were forthcoming with recruitment challenges and revealed that their existing employees were the result of mainland recruitment/relocation – hence their workforce composition (caucasian male) did not reflect the island’s diverse ethnic demographics. The female representation in the technical positions was on average 0%, with the high 13% by one federal contractor. We subsequently conducted research that documented a two to two-and-a-half year trend line when “imported” employees sought to return to the communities where they had family ties/roots. By further establishing a relocation cost matrix, MEDB was able to show a diminished “Return on Investment” (ROI) to employers on relocated employees, substantiating the “bottom-line” value and need for a homegrown workforce. This added the necessary dimension of employer buy-in for our Women in Technology program.

To assess the rural access challenges and opportunities presented by the lack of a four year university on Maui, we compiled an inventory of technology training providers and curriculum available in Maui County, including distance learning degrees/certificates. A gender breakdown of enrollment, showed that while women comprised almost 65% of the student population at Maui Community College, they were only 11% of the technology/physical science disciplines. Realizing that women were a large untapped resource, the project included extensive research to gather best practices from other mainland initiatives working to expand the number of

women in the scientific and technology career pipeline.

Locally convened/primary research was critical to both establish credibility with stakeholders and to determine what barriers have precluded Hawaii women from entering technology fields; to identify the societal and cultural influences that have deterred initial academic pursuits in technology; and to assess successful recruitment strategies to increase female job entrants into technology fields, both in job attraction and retention. Although MEDB sought to complement and build on existing research and innovations from the current body of available national and state data, cultural bias frequently dismisses/or discounts national research without accompanying local research.

Another critical stakeholder was educators. Through personal interviews, focus groups and surveys, MEDB gathered data from job entrants, teachers and guidance counselors. High school juniors and seniors and junior college women were targeted to evaluate credits in math/science/computer training and to determine self-direction in pursuit of higher education in technology fields or related jobs, and the positive/negative influences of teachers, parents, peers, media, and cultural mores.

EDUCATION OF GATEKEEPERS/SHAREHOLDERS: “SHARE THE VISION”

After all the data had been gathered and a gap analysis performed, it was time to start communicating the vision to gatekeepers and shareholders. MEDB’s WIT program began introducing the program into the community with the formation of a broad-based collaborative advisory committee that included the state’s Department of Labor and Industrial Relations; the Maui Division of Workforce Development, the County Department of Economic Development; the Maui Community College; Hawaiian

Commercial & Sugar Company (union employer); Maui Electric Company (union employer); private technology employers; Maui High Performance Computing Center (MHPCC); hotel/visitor industry and members of the women's community including the Hawaii State Commission on the Status of Women, the Business & Professional Women, and the American Association of University Women. This committee was convened to assist with project development and implementation, providing oversight, general review, and mid-course corrections if needed. MEDB's research was shared with the advisory committee and presented to community stakeholders.

The Women in Technology Program was officially launched in the community via a conference "Building Careers for Maui—Women in Technology Conference." Attracting 240 participants, the attendees included 11th and 12th grade students, teachers, guidance counselors, parents, Maui Community College and University of Hawaii students and faculty, private training providers, and industry leaders. WIT organized a panel of Hawaii's female technology professionals who gave an overview of their respective educational and career paths. NASA Astronaut, Joan Higginbotham, gave an inspiring keynote address. Afternoon breakout sessions were conducted that showcased the various technology training options available on Maui and employment opportunities.

Subsequent to a successful community launch, WIT sought to build a cadre of teachers and counselors who would nurture young women and girls into tech careers. Through participation in education department and district conferences, we nurtured and strengthened our relationships with teachers, counselors, and students, while instilling WIT's vision and mission with educational stakeholders.

Political Clout- "Work with what you've got"

A critical component to success in fundraising for the WIT program is our ability to network and cultivate relationships. Through one such relationship with Senator Inouye, WIT was able to secure a congressional earmark after the National Commission for the Advancement of Women and Minorities in Science, Engineering, and Technology (CAWMSET) [1] Report strengthened the validity of our research and reinforced the criticality of WIT's mission. This did not happen by accident. WIT analyzed its research, including education resources and participation demographics, documented technology training providers and curricula, and compiled data regarding female participation in secondary and post-secondary technology education in Maui County, statewide and nationally. A compelling report was created by combining this information with our other research on barriers that preclude women from entering technology fields, and community employment projects. Strategically juxtaposing the findings of WIT's report [2] to coordinate with CAWMSET's report was instrumental in gaining support at the highest levels of state government.

DON'T REINVENT THE WHEEL

WIT's research affirmed that access to mentors was a critical factor in women successfully completing academic requirements for technology careers. WIT, capitalized on a changing paradigm in higher education which acknowledged the community colleges as a major gateway for women entering/re-entering higher education. After productive dialogue with MentorNet, the award-winning electronic NSF program of excellence, which serviced the elite engineering universities across the nation - MEDB helped broaden their program to include two-year vocational education programs. Maui Community College was accepted into the first cohort of

community college students serviced by the electronic mentoring network, which pairs a professional working in industry or national laboratories with an engineering or natural science major. The program's successful formula has helped stop the 75% to 100% attrition rates of women exiting MCC technical programs.

INNOVATE AS WELL AS REPLICATE

WIT faced unique challenges in broadening its programmatic scope due to our unusual geography. Maui County is composed of three islands, with the largest population base on the Island of Maui, and statewide Hawaii has five main islands. Extending our leadership training workshop for educators and industry to neighbor islands required innovative solutions. A video-conference workshop broadcast to eight statewide rural communities was one such solution. Participation at each rural site would not have been large enough to justify sending a workshop team to each location. Through video-conferencing we were able to efficaciously maximize our outreach, garnering 60 attendees statewide.

ORGANIZATIONAL CAPACITY-"CRITICAL MASS"

WIT's training workshops guided key stakeholders, employers and partners through an individualized "Action Plan" to recruit and retain more girls/women into their education/work environments. The program has provided ongoing and customized technical assistance to help facilitate the partners' respective plans. Three years post launch – Maui County's technology workforce has seen a 10% increase in women. We are incrementally building critical mass.

Take away lessons: Paradigm for Success:

- Share the vision
- Work with what you've got
- Innovate as well as replicate
- Expand your borders

ACKNOWLEDGMENT

The Women in Technology Project is funded by the U.S. Department of Labor.

REFERENCES

[1] CAWMSET REPORT - THE COMMISSION ON THE ADVANCEMENT OF WOMEN AND MINORITIES IN SCIENCE, ENGINEERING, AND TECHNOLOGY DEVELOPMENT, *CAWMSET REPORT*,
[HTTP://WWW.NSF.GOV/OD/CAWMSET/START.HTM](http://www.nsf.gov/od/cawmset/start.htm)
ACCESSED ON APRIL 8, 2002.

[2] MAUI ECONOMIC DEVELOPMENT BOARD, INC., MAUI COUNTY HIGH SCHOOL TECHNOLOGY SURVEY, JANUARY 2000