

Puget Sound Consortium for Manufacturing Excellence 2003 Evaluation Summary for the NSF National Visiting Committee

The Puget Sound Consortium for Manufacturing Excellence (CME) is a dynamic education-industry partnership working towards building the connection between manufacturing technology education, student career goals, and private sector demand. The CME has the following three objectives:

Objective 1: Deploy a manufacturing technology curriculum that will ensure that graduates of manufacturing programs can meet national skill standards.

Objective 2: Promote professional development of high school instructors, college faculty and manufacturing trainers by providing high quality instruction on the use and application of CME instructional products.

Objective 3: Present a plan for curriculum articulation and interaction between high schools, community and technical colleges, four-year colleges and universities, and industry.

PROGRESS THE SECOND YEAR

Progress on Objective 1: Curriculum and Objective 2: Professional Development

In year two, Curriculum Design Teams were established to redesign the MTAG curriculum modules. The goals were to enhance the current MTAG modules to make them interesting to diverse students and to include appropriate assessment tools. A 19-module curriculum was designed/revised and pilot tested with high school students and instructors at the Summer Workshop, and with educator interns who participated in the CME/MTAG internship. Overall, the high school students reported positive impressions of the three modules they experienced. Students reported that the objectives were clear and that objectives were met by each modules' end. The high school students also indicated that it was easy to stay focused on the module and the exercises were helpful in learning the material, but they did not find the modules very challenging. One instructor facilitated the three modules as a professional development opportunity. Like the students, this instructor reported favorable perceptions of the two modules for which surveys were completed. The educator interns, on the other hand, were less favorable in their ratings of the nine modules reviewed. The educator interns made several suggestions for revisions to improve the modules that they reviewed such as include more activities, subdivide the modules, and address more competencies. Once revisions have been made to the module curriculum, additional pilot testing may be conducted to further refine the curriculum. A curriculum consultant is also in the process of ensuring adequate assessments are included with each module.

Progress on Objective 3: Articulation

Student Field Trips

To build interaction between middle schools, high schools, community and technical colleges, and industry while promoting manufacturing careers, the CME and the Mathematics, Engineering, and Science Achievement (MESA) Program co-sponsored two student field trips - one to Renton Technical College, and another to Edmonds Community College and Dillon Works manufacturing company. Students rated the field trips very positively. Tables 1 and 2 present selected student ratings for the field trips.

Table 1. Renton Technical College Field Trip Ratings

Overall, how much did you like the field trip? (n = 34)					
I really didn't like it 1	I didn't like it 2	I liked it 3	I really liked it 4	Mean	Standard Deviation
0	2 (6%)	17 (50%)	15 (44%)	3.38	.60
If you could go on another field trip about manufacturing technology, would you want to? (n = 34)					
Definitely Not 1	Probably Not 2	Probably 3	Definitely Yes 4	Mean	Standard Deviation
0	1 (3%)	13 (38%)	20 (59%)	3.56	.56

Table 2. Edmonds Community College and Dillon Works Field Trip Ratings

Overall, how much did you like the field trip? (n =15)					
I really didn't like it 1	I didn't like it 2	I liked it 3	I really liked it 4	Mean	Standard Deviation
0	0	4 (27%)	11 (73%)	3.73	.46
Do you think you'd be interested in a career in manufacturing technology in the future? (n = 15)					
Definitely Not 1	Probably Not 2	Probably 3	Definitely Yes 4	Mean	Standard Deviation
0	3 (20%)	9 (60%)	3 (20%)	3.00	.65

When planning future field trips, it was recommended that planners consider what students thought was best about the event and incorporate students' specific suggestions for improvement.

SCORE Program Interview

The director of the Highline Community College Students of Color Opting to Reach Excellence (SCORE) program was interviewed to provide insight to CME recruitment and retention program development. SCORE is a program designed to recruit diverse students. The director reported that, for a successful program, there should be no participation fees, and recruitment should involve face-to-face contact with high school career counselors and principals and occur several months before program events. Events should include interactive small group activities, interaction with college students, short lunch breaks that are consistent with "college life," and program scheduling should consider the restrictions of students' daily schedules. Interestingly, these recommendations converged with findings from the student field trip surveys.

Focus Groups

The CME commissioned three focus groups to gather information for diverse student recruitment and retention program development. Focus groups were conducted with women re-entering the workforce, a community group comprised of parents involved with the MESA program, and a group of manufacturing industry leaders. The women's and parents' groups explored participants' perceptions of careers in manufacturing, barriers to pursuing these careers, and training opportunities. The industry leaders group explored participants' expectations for the future of manufacturing and their attitudes, values, and ideas regarding the recruitment of women and diverse populations.

Participants in the women's and parents' groups had little knowledge of, or experience with, the manufacturing industry, and consequently, many responses were based on negative stereotypes. Participants identified many barriers to pursuing manufacturing careers such as a lack of knowledge about manufacturing industries, negative perceptions (e.g., stereotypes, frequent layoffs), and a lack of financial resources for training. If a manufacturing career were to be pursued, there was a preference for upper-level positions and positions with many opportunities for advancement. On-the-job training and internships were considered very attractive training options as were easily accessible training locations.

The industry representatives expressed some concern that lower level production may be at risk in this state, but technology skills will be in demand. They explained that manufacturing careers of the future will require individuals who are highly skilled, technologically savvy, good communicators, big-picture thinkers and problem solvers. Participants said there are many career paths available in manufacturing industries, and they felt there is no bias against women or people of diverse ethnic backgrounds. However, several other potential barriers to pursuing manufacturing careers were acknowledged including negative stereotypes, variable economic cycles, lack of public knowledge, and poor marketing.

Based on the focus group findings, it was suggested that the manufacturing industry partner with educational institutions to provide financially feasible training opportunities such as internship programs. Marketing strategies need to dispel negative stereotypes and increase public knowledge of the benefits of manufacturing careers. Moreover, it was suggested that all recruitment and retention efforts should reach out to women and people of diverse ethnic backgrounds. These findings were presented at the New Jersey Center for Advanced Technological Education (NJCATE) national conference on student recruitment and retention strategies for engineering technology, and they were very well received.