

Puget Sound Consortium for Manufacturing Excellence 2001-2002 Evaluation Report

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INTRODUCTION

The Puget Sound Consortium for Manufacturing Excellence (PSCME) establishes a manufacturing technology consortium to develop and implement programs and services that will provide Washington State industries with the tools, techniques, and philosophies required for world-class manufacturing. Evaluation targets of the program are:

- By the end of the three-year program, enrollment of post-secondary students and incumbent workers in college programs will increase by 30 percent, with minority and female student enrollment increasing by 40 percent.
- Over 50 percent of Puget Sound regional community colleges will adopt and integrate at least 2 modules in their program.
- 75 percent of curriculum modules will have at least 4 high school and 2 community colleges as major sites for implementation.
- 100% of industry skill standards will be targeted in the CME curriculum modules.
- All skill standards will be documented as part of at least one of the first six modules.
- All skill standards will be documented as part of at least one of the first six modules.
- All skill standards will be documented as part of at least one of the second six modules.
- At least 15 instructors from regional high schools and community colleges will participate in workshops during the second year.
- Workshop participant response means on course evaluations will fall in the “satisfied” range.
- Skill outcomes will be documented during application in work-like settings.
- Student satisfaction response means on course evaluations will fall in the “satisfied” range.

PROGRESS THIS YEAR

The first year of the PSCME has included meetings to establish partnerships and to disseminate information. Every quarter, the Steering Committee meets to share reports on outcomes and discuss future program strategies. At the first meeting, Program Manager Mel Cossette, provided participants with handouts concerning the program timeline, staffing structure, and a preliminary schematic of a modular curriculum system. Cas Cogswell from the Seattle-King County Workforce Development Council described the council’s proposed economic and labor market research. For each successive meeting, an update on program progress has been given, as well as discussion of related topics and plans for future activities.

Establishing Baseline Data

Beginning in November 2001, a subcommittee was formed to identify baseline data gathering activities. At this meeting, it was decided to identify Classification of Instructional Program (CIP) codes for Washington State Community and Technical Colleges that would match PSCME program activities.

Working closely with State Board of Community and Technical Colleges (SBCTC) staff, Mel Cossette, Tom Stoebe and Laurie Collins identified and investigated a variety of CIP codes:

- Machinist and Machine Technology (Machine Shop) 480501
- Computer Integrated Manufacturing 470495
- Mechanical Engineering Technology 150805
- Manufacturing Engineering Technology 150603 and 150694
- Computerized Numerical Control Machining 480501, 480506 and 480592
- Pulp and Paper Manufacturing Technology 030509

Using the SBCTC database, program matrix and CIP code definitions, student enrollment data was analyzed for potential tracking during the PSCME program. The following chart presents the major findings for each of the CIP codes:

| CIP | Program Title | Community and Technical Colleges | Results |
|--------|--|--|---|
| 480501 | Machinist/Machine Technology Machine Shop Computerized Numerical Control Machining | Bates Bellingham Clark Clover Park Columbia Basin Grays Harbor Green River Lower Columbia Lake Washington Renton Seattle-South Shoreline Spokane Walla Walla Yakima Valley/Perry | <ul style="list-style-type: none"> • Represents 15/33 community colleges in the state • Includes certificate and AA programs • Student population data accessible • Declining enrollment since 1997-1998 • 5 colleges with highest enrollment are Renton, Lake Washington, Shoreline, Spokane • 3 colleges with lowest enrollment are Bates Columbia Basin, Grays Harbor • Good coverage of the state • Lowest enrollments in areas of ethnic diversity |
| 470495 | Computer Integrated Manufacturing | Green River Renton Spokane | <ul style="list-style-type: none"> • Green River and Renton have no students enrolled in the program from 1993 to 2001 |
| 150805 | Mechanical Engineering Technology | Bates Bellingham Green River Lower Columbia Shoreline South Seattle Spokane | <ul style="list-style-type: none"> • CIP definition does not match PSCME program. Trains assistants to support engineers |
| 150603 | Manufacturing Engineering Technology and | Bates Clark Everett Highline Pierce Renton Wenatchee Valley Yakima Valley | <ul style="list-style-type: none"> • CIP definition does not match PSCME program. Trains assistants to support engineers |

| | | | |
|--------|--|--|--|
| 150694 | Manufacturing Engineering Technology | Bates Clark Everett Highline Pierce Renton Wenatchee Valley Yakima Valley | <ul style="list-style-type: none"> Only Bates, Everett, Highline, and Wenatchee Valley show any students enrolled (4/8 colleges) in 2000-2001 |
| 480506 | Computerized Numerical Control Machining | Bates Shoreline Spokane | <ul style="list-style-type: none"> CIP definition does not match PSCME program. Trains Sheet metal workers only. Inactive program at Shoreline. |
| 480592 | Computerized Numerical Control Machining | Bates Lower Columbia Renton Shoreline | <ul style="list-style-type: none"> Renton shows students enrolled 1993-2001. Bates has 3 students enrolled in 1999-2000 but no enrollment for other years. |
| 030509 | Pulp and Paper Manufacturing Technology | Lower Columbia | <ul style="list-style-type: none"> Collaboration might be advantageous to the PSCME program. |

If the PSCME program targets colleges and programs with CIP code 480501, fifteen of the thirty-three Washington State Community and Technical Colleges would be included in the program. These colleges are located across the state and include twenty-five counties, represented in the shaded areas of the chart below.

| Community/Technical College | District | Year | Location | Counties Served |
|------------------------------|----------|------|--------------|---|
| Peninsula | 1 | 1961 | Port Angeles | Clallam, Jefferson |
| Grays Harbor | 2 | 1930 | Aberdeen | Grays Harbor, Pacific |
| Olympic | 3 | 1946 | Bremerton | Kitsap, Mason |
| Skagit Valley | 4 | 1926 | Mt. Vernon | Island, San Juan, Skagit |
| Everett | 5 | 1941 | Everett | Snohomish |
| Seattle Central | 6 | 1966 | Seattle | King |
| Seattle North | 6 | 1970 | Seattle | King |
| Seattle South | 6 | 1970 | Seattle | King |
| Seattle Vocational Institute | 6 | 1987 | Seattle | King - Seattle's Central District |
| Shoreline | 7 | 1964 | Seattle | King, Snohomish |
| Bellevue | 8 | 1966 | Bellevue | King |
| Highline | 9 | 1961 | Des Moines | King |
| Green River | 10 | 1965 | Auburn | King |
| Pierce | 11 | 1967 | Lakewood | Pierce |
| Centralia | 12 | 1925 | Centralia | Lewis, Thurston |
| Lower Columbia | 13 | 1934 | Longview | Cowlitz, Wahkiakum |
| Clark | 14 | 1933 | Vancouver | Clark, Skamania, Klickitat |
| Wenatchee Valley | 15 | 1939 | Wenatchee | Chelan, Douglas, Okanogan |
| Yakima Valley | 16 | 1928 | Yakima | Kittitas, Klickitat, Yakima |
| Spokane | 17 | 1963 | Spokane | Ferry, Lincoln, Pend Oreille, Spokane, Stevens, Whitman |
| Spokane Falls | 17 | 1970 | Spokane | Ferry, Lincoln, Pend Oreille, Spokane, Stevens, Whitman |
| Big Bend | 18 | 1962 | Moses Lake | Adams, Grant, Lincoln |
| Columbia Basin | 19 | 1955 | Pasco | Benton, Franklin |
| Walla Walla | 20 | 1967 | Walla Walla | Asotin, Columbia, Garfield, Walla Walla |
| Whatcom | 21 | 1970 | Bellingham | Whatcom |
| Tacoma | 22 | 1965 | Tacoma | Pierce |

| | | | | |
|-------------------|----|------|------------|-----------------|
| Edmonds | 23 | 1967 | Lynnwood | Snohomish |
| South Puget Sound | 24 | 1962 | Olympic | Thurston |
| Bellingham | 25 | 1957 | Bellingham | Whatcom |
| Lake Washington | 26 | 1949 | Kirkland | King, Snohomish |
| Renton | 27 | 1941 | Renton | King |
| Bates | 28 | 1940 | Tacoma | Pierce |
| Clover Park | 29 | 1942 | Tacoma | Pierce |
| Cascadia | 30 | 1994 | Bothell | Snohomish, King |

Additionally, if the program specifically tracks the colleges with CIP code 480501 and which have the highest and lowest student enrollment, the program will impact colleges across the state (see chart below and graphs on next pages). Colleges that have the lowest student enrollment in this CIP code are located in ethnically and economically diverse areas of the state, which would create an opportunity for the program to meet the objective of increasing the enrollment of minorities and women.

| |
|---|
| CIP TITLE: MACHINIST/MACHINE TECH |
| CIP: 480501 |
| 2000-2001 |
| 5 High = Renton, Lake Washington, Shoreline, Clark, Spokane |
| 5 Low = Grays Harbor, Bates, Walla Walla, Green River, Seattle-South/Columbia Basin |
| 1999-2000 |
| 5 High = Renton, Shoreline, Lake Washington, Spokane, Green River |
| 5 Low = Bates, Columbia Basin, Grays Harbor, Walla Walla, Lower Columbia |
| 1998-1999 |
| 5 High = Shoreline, Renton, Lake Washington, Spokane, Clark |
| 5 Low = Bates, Columbia Basin, Grays Harbor, Walla Walla, Lower Columbia |
| 1997-1998 (highest year of total enrollment) |
| 5 High = Shoreline, Renton, Spokane, Lake Washington, Clark |
| 5 Low = Bates, Columbia Basin, Grays Harbor, Walla Walla, Lower Columbia |

Furthermore, colleges that offer CIP code 480501 include those with both certificate and degree programs:

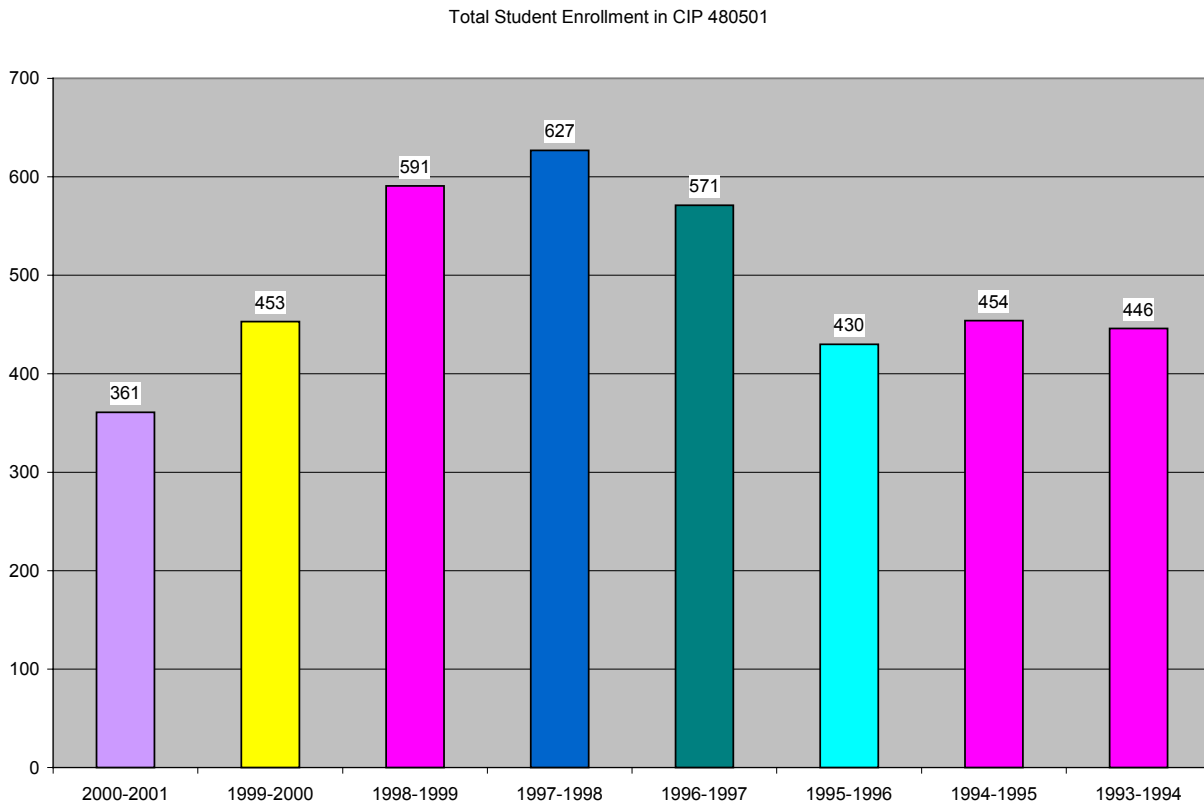
| | | |
|-----------------|---------------------------------------|----------------|
| Bates | 2061/2160 clock hours | award = C or T |
| Bellingham | 2160 clock hrs | award = A |
| Clark | 33/115 credits or 1848/1650 clock hrs | award = A or C |
| Clover Park | 108 credits or 2107 clock hrs | award = C |
| Columbia Basin | 112 credits | award = A |
| Grays Harbor | 90 credits | award = A |
| Green River | 08-111/44 credits or 677 clock hrs | award = A or C |
| Lower Columbia | 114/88/14 credits or 220 clock hrs | award = A or C |
| Lake Washington | 120/80 credits or 1980/1320 clock hrs | award = A or C |
| Renton | 2720/2520 clock hrs | award = A or C |
| Seattle-South | 114-116/70 credits or 1067 clock hrs | award = A or C |

| | | |
|---------------------|--|----------------|
| Shoreline | 128/65-73 credits or 180/650-730 clock hrs | award = A or C |
| Spokane | 120/112/61/61 credits or 990 clock hrs | award = A or C |
| Walla Walla | 90/72 credits or 875 clock hrs | award = A or C |
| Yakima Valley-Perry | 27 credits or 270 clock hrs | award = A |

Confirming the Baseline

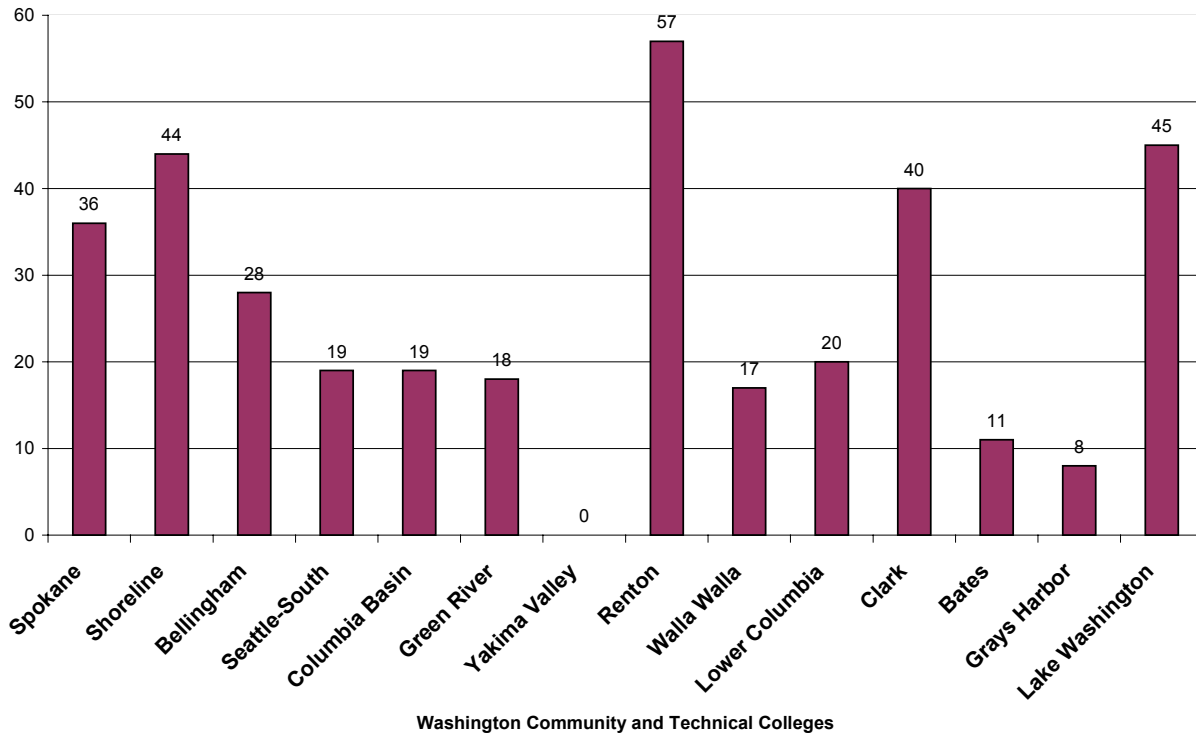
The subcommittee working to establish baseline data reconvened in early January to discuss the findings. Information was presented on all the CIP codes, student enrollment, and possibilities for baseline data tracking during the program. At this meeting, it was decided to limit the baseline enrollment information to the best match with the PSCME program, which was CIP code 480501, and to track the colleges with the highest and lowest enrollment to see if the program makes a difference. At a Steering Committee meeting in January 2002, members viewed information concerning the progress in establishing baseline information and were able to ask questions for clarification.

The following chart illustrates total student enrollment in CIP code 480501 in community and technical colleges in Washington State.



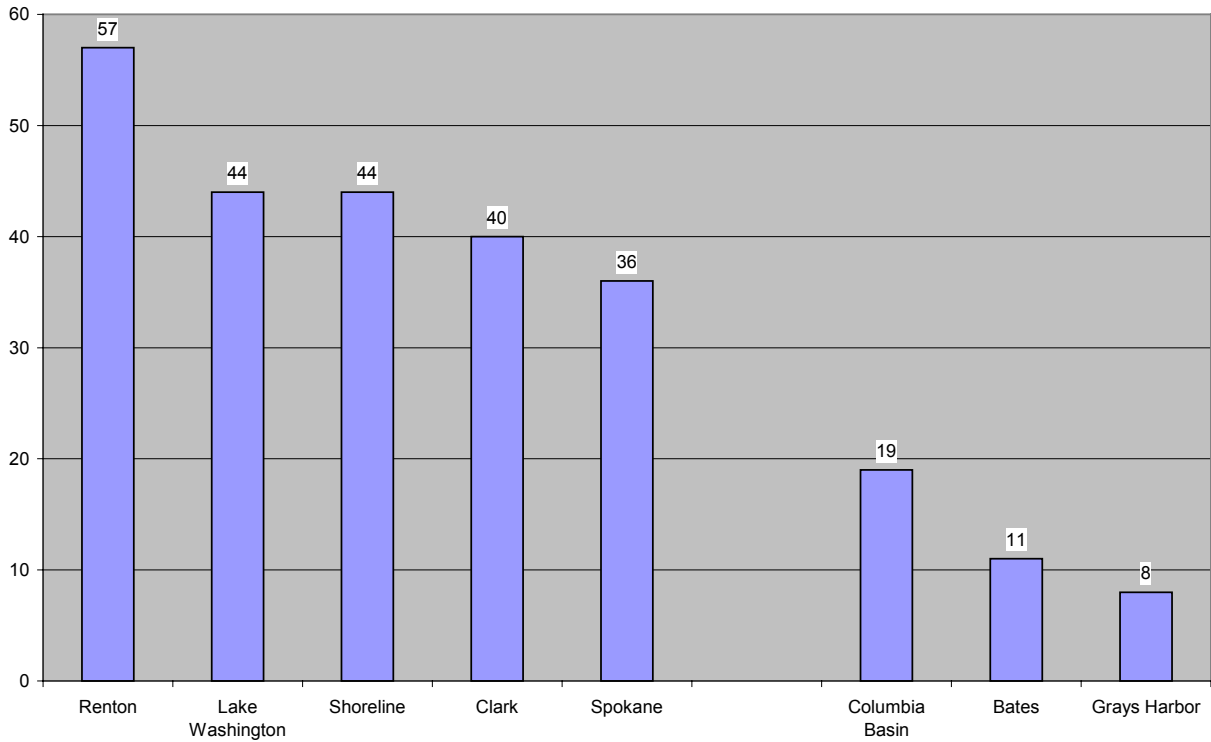
Washington State community and technical colleges with CIP 480501 in the academic year 2000-2001 are included on the following chart:

2000-2001 Student Enrollment Data in CIP 480501



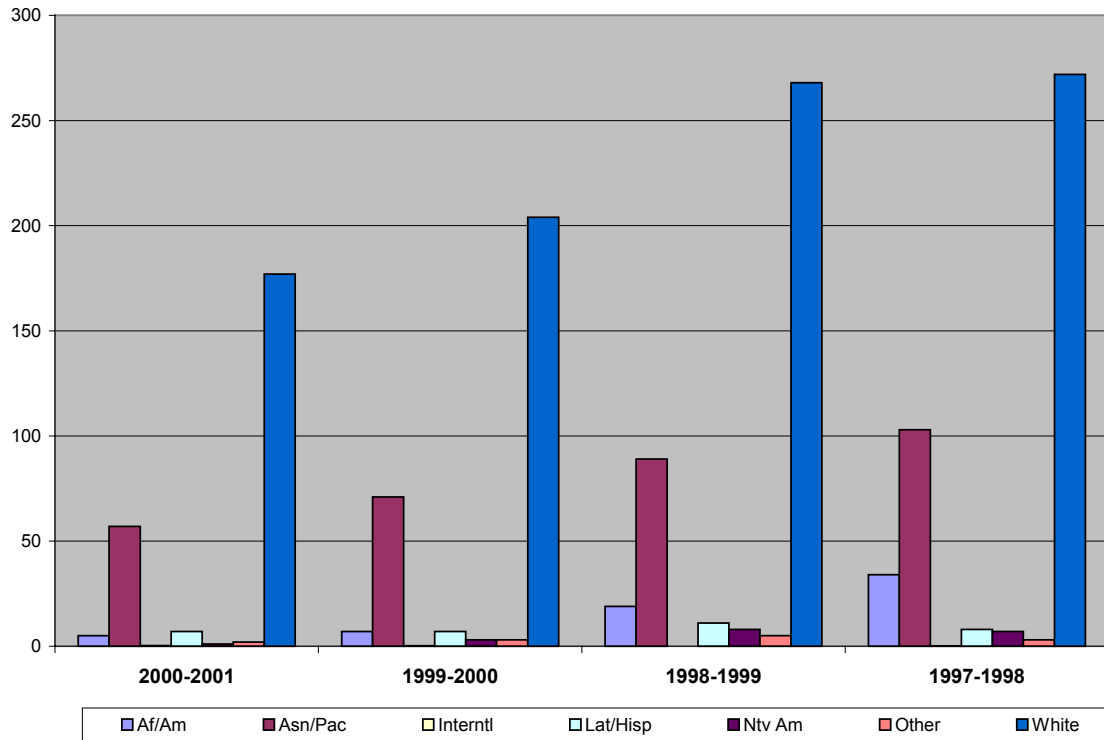
The outcome of this process is that the evaluation for the PSCME program will track enrollments in CIP 480501 in Renton, Lake Washington, Shoreline, Clark, Spokane, Columbia Basin, Grays Harbor, and Bates Colleges as a subset of all the colleges in the state with CIP 480501. A chart showing enrollments in these colleges is included on the next page.

2000-2001 Student Enrollment in CIP 480501

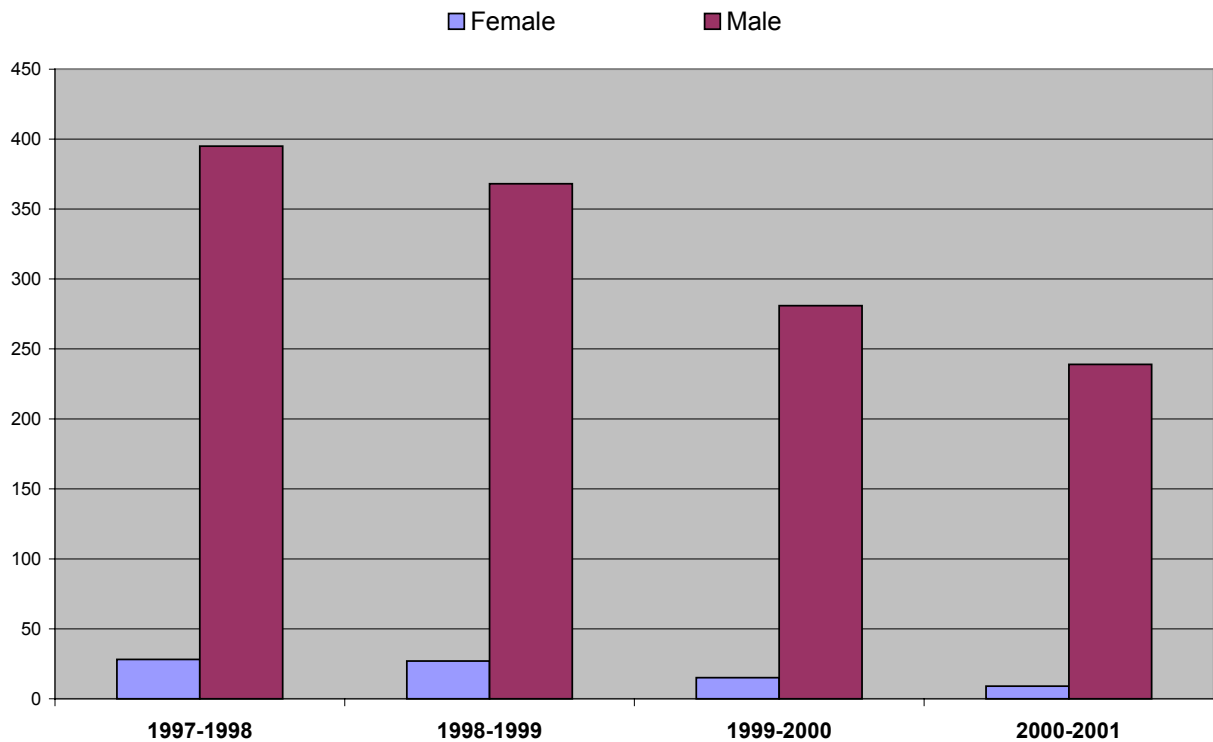


Increasing minority student and female student enrollment is also a goal of the PSCME program. The current information concerning diversity is rather dismal at this time. Initial data show that few minority students are enrolled in these programs across the state and the proportion of female students enrolled is very small. The following charts illustrate this picture.

Student Ethnicity



Student Gender



CURRENT STEPS

The PSCME plan is to work with its educational partners to modularize manufacturing technology curriculum based on existing, regionally focused industry skill standards. Partner colleges and tech-prep programs will use these modules in their manufacturing and engineering programs. Professional development activities provided by the consortium will include workshops for faculty on the design and use of the modularized curricular system. Given that the Accreditation Board for Engineering and Technology (ABET) encourages outreach programs for two- and four-year-degree granting institutions, the PSCME will also assist high schools and colleges in promoting manufacturing career opportunities to students.

A curriculum consultant, David Lee, has been hired and is beginning his investigation into the current state of manufacturing curriculum in community and technical colleges across the state. The first step in his plan is to gather as much information as possible from websites and written materials to create a curriculum map for each college. Then he will meet with college administrators and instructors to discuss their perceptions of the current curriculum and possibilities for future development.

A plan has been developed for the summer workshops, now called Tri-Institutes. PSCME members are collaborating with instructors from Bellevue and Edmonds Community Colleges to plan summer Tri-Institutes that will accomplish the goals of the program and will capitalize on unique strengths of each partner. On June 24-28, a Tri-Institute will be held in the Puget Sound region and on August 13-18 a Tri-Institute will be held in Spokane, on the east side of the state. Sixty community college and high school instructors will attend each time and will be involved in creating a seamless curriculum that transitions from the 12th to 13th grades. On the first day, Tri-Institute agenda items will include: objectives, outcomes, performance criteria, and assessment. On days 2 through 4, instructors will be divided into 3 groups: instructional technology, manufacturing, and materials. These groups will meet at remote sites to develop curriculum and hands-on activities. On the last day, instructors will again meet in a large group to share their experiences and relate them to the skill standards. In March of the 2002-2003 academic year, instructors will reconvene to show evidence of their progress. A Tri-Institute survey will be developed to investigate learning, attitudes, and future plans of these instructors.

The PSCME Program Manager and Steering Committee are very active in establishing connections with partner organizations. Already, an initial meeting was held with the State Math, Engineering, and Science Achievement (MESA) director to discuss opportunities to collaborate and encourage minority students to continue their education. With the current minority student enrollment picture so bleak, establishing these connections is essential for success. A plan for upcoming hands-on field trips for minority students to visit local community colleges is in development.

CONCLUSIONS

Based on the progress this year, it can be concluded that the first year of the PSCME program has been successful. From the evaluator's standpoint, several reasons account for the great strides made during the first year of the PSCME program:

- A dynamic, organized program manager leads the effort.
- The steering committee is dedicated to the mission of the program and supportive of the current accomplishments.
- A solid baseline of enrollment data has been established and will be the gage upon which results will be measured.
- Connections have been made across Washington State that are essential to the success of the program.

If the progress made this first year is an indication of the future, the goals of the program will be met and might possibly be exceeded.