

The 5 Step Process Workshop

STEM CASE STUDY

Samuel Johnson School District (SJSD) has three high schools and a Career and Technical Center where 11th and 12th grade students go for a half day program that are interested in any of the CTE programs offered there. The three high schools also have CTE programs offered at each of the comprehensive high school sites such as agriculture, business education and introductory industrial technology, computer technology courses. The Career Technical Center offers a wide array of CTE programs including Cosmetology, Health Professions, Child Development, Business Administration, Agriculture, Construction, Auto Mechanics, Auto Body, Drafting, Precision Metal Working, Welding, Engineering and Computer Networking. The Computer Networking program is a CISCO Academy program and has received many accolades throughout the community for producing students who are able to access high wage jobs upon graduation. The SJSD is also involved in Project Lead the Way and has PLTW programs in all the middle schools and high schools.

Mead Community College (MCC) is located in the area and is typically the two year postsecondary education choice for students graduating from one of the SJSD's high schools. The SJSD has developed articulation agreements with MCC for many of the CTE programs offered at both the comprehensive high school and the Career Technical Center. MCC has a pre-engineering program and computer technology program that was developed in response to a growing information technology and manufacturing industry sector that is highly supported by the community economic development agency.

When Perkins III was implemented and the requirement that data be collected on students participating and completing nontraditional careers, SJSD and MCC identified their nontraditional programs and began collecting data and reporting it to the state. They were confident that their programs were open to all students and they had no barriers to student access based on gender. They regularly sent a representative from the school district to the State Department of Education's professional development conferences on gender equity and nontraditional programs. They both were careful to include representation of both males and females in all promotional materials. Every year the district and the community college partnered to hold a career fair at the MCC campus and were involved in the planning. They were always careful to do their best to get nontraditional speakers for the represented careers.

At the end of each year both SJSD and MCC completed their annual performance reports for their Perkins funding and submitted them to the State Department of Education. This went on for six years without a hitch. Suddenly, with the implementation of Perkins IV, the state returned information to both SJSD and MCC indicating they were not meeting the state's performance measure for the nontraditional core indicator. As a result they were now required by the state to develop an improvement plan that indicated how they were going to improve their performance or they might lose their Perkins funds.

What performance data should they review to help them identify their problem?

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PROBLEM

After reviewing the data some informative trends and gaps regarding participation in nontraditional programs at both the high school and community college were revealed. They discovered some disconcerting problems:

- The CISCO Academy program at the Career Technology Center had less than 5% female enrollment in its best year in the last three years.
- The female enrollment in computer technology courses at the comprehensive high school ranged from 15% to 20% at each of the three high school campuses.
- The MCC computer technology program's female enrollment hovered around 18% but their completion rate was 6%
- The Project Lead the Way program had approximately 50% female enrollment at the middle school while the high school program had 10%. 80% of the PLTW female graduates had all gone on to four-year institutions, none to MCC.
- The Industrial Technology program at one of the high schools had over 20% female enrollment every year while the other two programs had from 0-5%.
- The Construction Technology program at the Career Technical Center had also seen a steady increase in female enrollment over the last five years from 0% to 15%.
- However, the Construction Technology program at MCC had seen a steady decline in their female enrollment over the last five years from over 25% to 5% with a marked decrease in 2007.

What self-assessment strategies should they implement to discover the root causes for the problems they have discovered?

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ROOT CAUSES

After conducting a thorough self-assessment process Samuel Johnson School District and Mead Community College determined the following root causes were leading to their lack of performance on the nontraditional Core indicator:

CISCO Academy/Computer Technology Program:

- The female students enrolled in the computer technology program at the comprehensive high school did not know anything about the CISCO Academy Program at the Career Technology Center. They had however developed the opinion that the program was for computer nerds although they could not explain why. They had little exposure to hardware maintenance or networking, as the courses offered in the computer technology program at the comprehensive high school were primarily software solutions courses.
- Trigonometry and Calculus were only offered in the afternoons at two of the three comprehensive high school campuses at the same time as the CISCO Academy courses at the Career Technology Center. Trigonometry and Calculus is not offered at the CTC.
- Mead Community College's computer technology program's introductory courses female completion rate was good while the second year courses were lacking returning enrollment and also had high drop out rates for females. The faculty (all male) conducted a survey of students who had dropped out either between years or during the second year and discovered that the students needed more academic and personal support and greater access to instructor time for additional assistance. Some students indicated financial problems, transportation and child-care, as barriers to completing the program.

Project Lead the Way

- The Gateway to Technology course at the middle school was required for all 8th graders as part of a STEM initiative the middle school had implemented. The course was co-taught by the industrial technology instructor, a young woman who recently left the engineering industry to teach and the math instructor, a young man who coached the girls basketball team. The middle school program sponsored students to attend a summer camp for students in engineering at MCC that was targeted to increasing the diversity of the engineering program. The camp was directed by students of the Society for Women Engineers college chapter.
- The PLTW program at the high school was relatively new. The courses are taught by the former industrial technology instructor in the old shop facilities that have been partially upgraded. When female students who had taken the prerequisite math and science courses for the PLTW sequence were asked why they did not consider taking these elective courses they thought they were just "shop" classes and of no interest to them. They were not familiar with the PLTW curriculum and had not been informed of its content. One student indicated that she had asked the guidance counselor about the program and had been discouraged from considering it.
- The engineering program staff at MCC interviewed the PLTW program female graduates from the last two years to discover that they were not aware of the program at MCC. Many of the girls indicated that they were told that they must attend a four year institution to pursue a degree in engineering and were never given the community college option for consideration.

What strategies could they implement to increase participation of females in either the CISCO Academy/Computer Technology program or the Project Lead the Way Program at the high school and pre-engineering program at the community college?