

Colorado Helps Advanced Manufacturing Program

Front Range Community College Case Study

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RUTGERS

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INTRODUCTION

The Colorado Helps Advanced Manufacturing Program (CHAMP) is a United States Department of Labor (USDOL) Trade Adjustment Assistance Community College and Career Training (TAACCCT)-funded grant project intended to develop new or redesigned online and hybrid courses leading to credentials in advanced manufacturing in high demand fields across the state of Colorado. The Colorado schools involved in CHAMP are a consortium of eight of the state's community colleges and one four-year institution: Front Range Community College (FRCC), Pueblo Community College (PCC), Red Rocks Community College (RRCC), Lamar Community College (LCC), Pikes Peak Community College (PPCC), Aims Community College (Aims), Community College of Denver (CCD), Emily Griffith Technical College (EGTC), and the Metropolitan State University of Denver (MSU Denver).

Prior to the development of CHAMP, the Colorado Advanced Manufacturing Alliance identified two gaps in the state's existing academic training programs that had been previously designed to meet the needs of the industry: 1) the lack of a consistent voice representing the needs of industry to the academic community and 2) the absence of a strong network to facilitate business-to-business activity partnerships with educational institutions. The CHAMP project was conceived to address these issues with the larger goal of making Denver and the state of Colorado a leading advanced manufacturing hub.

CHAMP is in place to increase the attainment of degrees and certifications in manufacturing in order to best serve employers' needs. In service of the market-oriented end of this goal, its programs are designed to produce 21st-century workers whose skills align to local market trends—community colleges work with local employers to align their programs with industry-recognized skills and competencies. With regard to increasing the number of graduates entering the market, CHAMP is focused on creating innovative and flexible learning opportunities for students. The grant calls for schools' existing courses to be adapted for hybrid delivery, for example, such that a portion of the traditional face-to-face instruction is replaced by web-based, online learning.

In addition to designing or redesigning advanced manufacturing programs to fit a hybrid model, each college is required to integrate open education resources (OER) into its CHAMP curriculum. OER are teaching, learning, and research resources that reside in the public domain or have been released under an intellectual property license that permits their free use and repurposing by others. OER may take the form of full courses, course materials, modules, textbooks, streaming videos, tests, software, or any other tools, materials, or techniques used to support access to knowledge. Under the CHAMP grant, consortium colleges are encouraged to use OER in the creation or redesign of online or hybrid courses and are also required to create or redesign their courses and programs such that they can be packaged and licensed as OER for use by other educators and institutions. Thus, staff at CHAMP colleges will package, license, and post their course materials during the course of the grant.

Each college in the consortium is also required to employ at least one CHAMP navigator to collaborate with employer–partners, local workforce centers, community and nonprofit organizations, and students to ensure students’ access to CHAMP resources and facilitate their success. Within each of these areas of collaboration, navigators work according to their institution’s needs to build CHAMP programs, recruit and retain students for CHAMP programs, and assist those students as necessary. Navigators track their interactions with CHAMP students to report outcomes based on a model of *intensive advising*, which involves multiple interactions and points of intervention with each student throughout his or her education to ensure each student’s success and, ultimately, employment.

Aside from these institution-specific innovations, consortium-level outputs are also to be integrated within each college. These include massive open education courses (MOOCs) and a new credit-for-prior-learning process. Three MOOCs were created at the consortium level: a math MOOC, a student success/employability MOOC, and a credit-for-prior-learning MOOC. Each college is encouraged to include one or more of the MOOCs in its program or institutional curriculum. The process at each college for awarding students credit for prior learning will also be redesigned at each college according to policies developed by the consortium.

This report is one of nine created to highlight each individual college’s contributions to the CHAMP project at year two of the grant. The purpose of this case study is to identify the implementation processes utilized by FRCC and to provide a summary of the FRCC CHAMP team’s activities, successes, and challenges to date. This case study begins with an overview of its methodology and data sources and then moves on to the contextual frame—demographic and socioeconomic background information about FRCC, its student population, and its service region. These sections are followed by a summary of the goals of FRCC’s CHAMP program; a discussion of the implementation of the program, including the design process and its incorporation of OER; a look at student and faculty perceptions of the program; an examination of employer and workforce center collaborations; a discussion of the CHAMP navigator position as it has developed at FRCC; an examination of the college’s approach to redesigning its credit-for-prior-learning options and processes; and a summary of successes, challenges to date, and recommendations for next steps.

METHODOLOGY/DATA SOURCES

This report examines the development and implementation of the first two years of the CHAMP grant at FRCC, including experiences of the project team members and participating staff, faculty, and students. As such, this report uses qualitative data and analysis. Subsequent EERC evaluation reports will include outcome measures and report on quantitative data collection and analysis.

The qualitative methodology for this report includes content analysis of consortium goals and activities to date, relevant proposals, and project- and college-specific statements of work, quarterly reports, and websites developed by individual colleges. EERC team members also

conducted phone and in-person interviews with college project leads, staff, faculty, navigators, and students.

Most interviews were taped and transcribed; non-taped interviews involved extensive note taking. These transcriptions and notes as well as the documents cited above have been coded through the use of NVivo qualitative data management software and analyzed by EERC team members to represent each college's individual story relative to the CHAMP project.

As noted above, while quantitative analysis will be presented in subsequent reports, this summary is meant for contextual purposes only and will only utilize data from qualitative analysis. For this reason, grant targets relative to each college, student counts, course counts, industry- and workforce-related targets, and other quantitative objectives will not be discussed as part of this report.

COLLEGE DESCRIPTION AND OVERVIEW OF STUDENT POPULATION

As the largest two-year college in Colorado, FRCC enrolls about 28,000 students annually at its campuses in Westminster, Longmont, Fort Collins, and Brighton and online for career/technical programs and guaranteed-transfer degrees. Spring 2015 enrollment totaled 18,858 students. Seventy-two percent of these students were part-time and 24 percent identified themselves as belonging to a minority. FRCC's student population is 57 percent women and 43 percent men.

The college offers four associate's degrees (Arts, Science, Applied Science, and General Studies) and over 100 certificates that range from emergency medical services to welding. It has 55 academic programs beginning with accounting and ending with welding technology. These programs include an Associate of Applied Science (AAS) degree in manufacturing and energy technology at the Larimer Campus (Fort Collins) that focuses on qualifying students for entry-level positions in manufacturing industries and maintenance of electrical equipment in energy industries. In the academic year 2014-2015, the college awarded 1,728 associate's degrees and 2,794 certificates.

FRCC'S CHAMP GOALS

Goals at the start of the grant

The primary goal for FRCC at the start of the CHAMP grant was to re-introduce and re-design a previously defunct machining program to answer the growing workforce needs of the community. In recent years, the manufacturing industry had demanded more trained machining technicians.

An advising committee of local employers was formed at the initiation of the grant. This is a requirement of Perkins for career and technical education, but also provided an opportunity for FRCC to engage closely with industry partners. This effort of creating a committee of industry

advisors and engaging them in the program also helped to serve the first of the four CHAMP primary goals: to establish and advance college-industry partnerships. Since the start, advisory board members have been an important and consistent resource in the development of FRCC's machining technology program, providing consultations on curriculum development, equipment purchases and work readiness. An employer outreach coordinator was hired in addition to the required grant navigator position. This position was to focus on building and managing relationships with local industry leaders; to gather feedback from employers for the program; to recruit incumbent workers to training; and to secure internships, apprenticeships, and employment opportunities for FRCC machining students.

In compliance with the second CHAMP goal, to provide technologically advanced education, FRCC has created a new Advanced Technology Center (ATC) for machining students. This center has both traditional machining equipment and state of the art equipment so that students can learn all aspects of the field. The equipment was purchased on the recommendation of employer advisory committee members: it was agreed that the budget should go towards machines that have applicability in the widest range of manufacturing professions. Also, in compliance with CHAMP conditions, 100 percent of all newly designed or redeveloped curriculum content has been transferred into the OER platform, available to all members of the Colorado Community College System (CCCS).

The third primary CHAMP goal is to redesign the credit for prior learning (CPL) policies to grant students academic credit for knowledge obtained outside of the classroom. Collecting credit for skills earned through life experiences, employment and special training (e.g. military) allows students to save time and money in obtaining their machining specialization. FRCC is currently working on evaluating its credential and transparency initiatives and setting up a CPL system, but at the time of our site visit it was still in its theoretical stage. CPL will be implemented in the machining program and more widely in the college as a whole. The college is considering different templates for the most effective gauging of skill for the machining program. The idea is that students who have taken non-credit coursework and those that came from industry can get credit. The machining program director stated that, while informal prior learning assessment is already done for customized instruction courses, there is a definite intention to institute a prior learning assessment (PLA) system for credit-bearing coursework and that it is likely to involve National Institute for Metalworking Skills (NIMS) projects as assessment tools. At the time of our site visit those at FRCC involved in CPL were awaiting the release of the new PLA Handbook with revised standards of implementation to move forward with any major decisions. For the time being, students in machining can test out of certain introductory elements of non-credit courses by passing a "Prove it!" challenge test and obtaining the instructor's permission. This option is only available for non-credit students.

The fourth primary goal of the CHAMP grant is to introduce structures and mechanisms for stackable/latticed certificates and articulation. A machining program had existed in the past but had gone defunct some years earlier, partly due to outdated equipment. Therefore, the four current program offerings – the precision machining technology certificate, the CAD/CAM

(Computer-aided drafting and computer-aided manufacturing) certificate, the manual machining certificate and the quality control certificate – are all new initiatives under CHAMP. As such, questions about how they can articulate to other programs at FRCC and within CCCS and Colorado is in discussion.

Career paths

At FRCC, the full-time credit program for precision machining technology is a 35-credit, three-semester certificate earned with successful completion of stackable Manual Machining, CAD/CAM and quality control certificates. In addition to this credit program, the college offers non-credit programming for students at night and non-credit “customized instruction” courses for industry. According to the campus vice president, historically, credit and non-credit courses tend to come into conflict and competition with each other but, thanks to meticulous, careful planning by the program director, FRCC has achieved a successful budgetary and logistical combining of those types of courses – a testament that such a program can be achieved.

At this stage, courses for credit are primarily being taken by “traditional”, college-age students and mid-career students seeking a change in career. They may be drawn to the credit program because they are seeking an academic degree. The non-credit training offered at nights is being taken by students who want a job soon, mid-life change-of-career students, hobbyists and incumbent workers (an estimated 50 percent) who enroll with the purpose of learning new equipment and industrial skills to boost skills and productivity at their existing jobs. The credit courses run over the usual 15-week semester comprised of 7.5 week sessions, while the non-credit courses are completed in nine weeks. Given the program’s excellent relationship with local industry leaders, it is not unusual for a FRCC machining student to receive job offers 10 to 20 weeks into training: according to the program director, by the time students complete intermediate level training, they are all but guaranteed employment.

The industry is experiencing a shortage of qualified machinists, and FRCC now has the capacity to train and certify highly skilled professionals who can look forward to joining an excellent job market. In May, 2015, mean national annual wages in machining occupations were as follows:

Occupation	National Annual Mean Wage	Colorado Annual Mean Wage
Machinist ¹	\$42,120	\$43,840
CNC Machine Operator ²	\$38,720	\$39,150
CNC Machine Programmer ³	\$51,630	\$53,220

The navigator reports that the availability of both credit and non-credit program options gives FRCC a competitive advantage as evidenced by students who enroll in FRCC machining training despite having a more conveniently located community college nearby. Students come for the fast non-credit training because they know that manufacturing businesses value experience and trade skills above an associate’s degree.

IMPLEMENTATION

Process of design/redesign

FRCC is committed to meet the industry standards set by NIMS. The project lead stated that both the credit and non-credit programs are “aligned to the NIMS certification.” A student who completes such a course is allowed to take the NIMS certification test onsite at FRCC. Instructors are being trained for NIMS standard compliance as well. A recent blog entry on the FRCC website reads:

As the first step in becoming a NIMS accredited institution, four Front Range Community College precision machining instructors have earned Level 1 certification. Two others have earned Certificates of Merit as they advance toward Level 1 status, and two other department personnel have earned credentials in areas of their responsibilities... FRCC students have begun earning NIMS credentials in various skill areas. In the past two semesters, 18 students earned a total of 37 certificates. These certificates provide employers with an indication of a candidate’s skill level.⁴

¹ Bureau of Labor Statistics, Occupational Employment and Wages, May 2015, for Machinists. Retrieved on April 21, 2016. <http://www.bls.gov/oes/current/oes514041.htm>

² Bureau of Labor Statistics, Occupational Employment and Wages, May 2015, for Computer-Controlled Machine Tool Operators, Metal and Plastic. Retrieved on April 21, 2016. <http://www.bls.gov/oes/current/oes514011.htm>

³ Bureau of Labor Statistics, Occupational Employment and Wages, May 2015, for Computer Numerically Controlled Machine Tool Programmers, Metal and Plastic. Retrieved on April 21, 2016. <http://www.bls.gov/oes/current/oes514012.htm>

⁴ Front Range Community College: Writing the Front Range, John Feeley. “FRCC Instructors, Staff Earn Certifications in Metalworking Skills.” January 05, 2016. Retrieved on January 27, 2016. <http://blog.frontrange.edu/2016/01/05/frcc-instructors-staff-earn-certifications-in-metalworking-skills/>

To ensure proper credentialing and standard compliance, a Met-Tech committee of manufacturing company representatives has been formed to inspect student NIMS projects to make sure they meet all the necessary requirements and specifications.

As a new reform, the machining program schedule has been redesigned to offer the same courses each semester, in contrast to previous years, when courses were offered only once per academic year. Before, if a student found out about a course past the enrollment deadline, he or she would have to wait a whole year to enroll. Likewise, if a student failed a course, she or he would have to wait until the following year to re-take it. With the new schedule, students have the opportunity to sign up for a class they want during any semester: this allows existing students to work through the program requirements faster and draws new students into the program throughout the academic year.

Bringing women into the machining/manufacturing program has been a major priority for FRCC; only three-to-five percent of students enrolled in the program are female. The navigator invested a lot of effort into researching the most effective ways to attract female students to the industry. She found out that for women to be interested in traditionally male-dominated trades, several conditions must be met: women do best in these professions when they are mentored by other women; they need to retain a certain degree of flexibility in order to take care of other responsibilities in their lives; there must be opportunity for upward mobility and financial security; and the work must have some degree of creativity in it. As the result, the navigator is working to create a female mentorship program, engaging the few existing female machining students as role models for the incoming cohort. Additionally, at the time of our site visit the college planned to launch their first female-only machining course scheduled to begin in January 2016.

In the past year, a “professionalism curriculum” has been developed and incorporated into some classes to boost motivation and to teach students the soft skills of discipline and work ethic they will need to succeed in any career they choose. The supervisory team for this effort includes two members of the advisory board who have first-hand knowledge of which professional skills employers value most in workers. Courses that are affected by the professionalism curriculum award 24 percent of the final grade on the basis of student “professionalism,” with points awarded for punctuality, teamwork, communication, wearing uniforms, etc. The navigator was very pleased with the results:

Prior to the addition of professionalism in the course content students were lackadaisical in their approach to being punctual. With the first couple of week a noticeable change occurred, students were running into the classroom to make sure they were on time. The instructor buy-in and enforcement has set the standard and the students have really responded.

Online courses/Open Educational Resources/Massive Online Open Courses

From the beginning of the grant, FRCC did not like the idea of hybrid courses. As one instructor explained, "Machining does not lend itself to online courses since so much learning must take place in the shop." Despite this some classes do have online components and all students have access to an online precision machining learning system and computer numerical control (CNC) machine tool simulation package, but the project lead emphasized the lack of necessity and intention to use hybrid courses. Project administrators pointed out that an industrial trade in machining is not something that can be well learned without a dominant physical presence, hands-on component. One staff member said:

...The students are here because they're hands-on... They are not classroom students. That's why they're not going to a four-year degree, or four-year school. And they're not in the classroom taking electrical engineering or mechanical engineering. They want to be on the floor.

Despite this perception, some students in the program have used one form of online learning. The consortium created a series of MOOCs for the CHAMP grant one of which focused on math skills. The navigator spoke about how this MOOC has been helpful to some students. She described the MOOC as "basically an online tutor." At the time of our site visit it had been used by several students who wished to test out of the Math 108 requirement for the program but had not earned high enough scores on the challenge. The navigator referred them to the math MOOC: once they completed the MOOC, they were allowed to re-take the test and, upon passing it, to claim the math credits.

Despite the lack of interest in using online curriculum for students, FRCC has put much of their curriculum into OER format. In accordance with CHAMP specifications, 80 percent of all redesigned and new courses for the FRCC precision machining program were successfully uploaded onto the OER platform by the January 1, 2016 deadline. The instructional designer created all course syllabi in accordance with FRCC guidelines and policies, complete with a course outline created using the Common Course Numbering System (CCCNS), the website that specifies the Colorado community college competencies. She has done her best to work with instructors to create well-rounded coursework by incorporating existing FRCC instructional materials and researching OER content from across the globe. To date, she has references from several states as well as Brazil, Chile, Mexico, Colombia, and Puerto Rico. In doing so, the instructional designer is careful to make sure all content qualifies for a Creative Commons (CC BY) copyright license, which enables a free distribution of otherwise copyrighted materials, in this instance, for educational purposes. She, likewise, provides all instructors with CCCNS competencies to make sure they stay in compliance.

If I don't find what is needed, I work with instructors on creating the content. We review with instructors...we decide what we are missing. I tell them what is needed and show them [materials] for OER and ask them to give me what they can, even on the paper.

After that, they do their research, give everything to me, I make sure the format and everything is correct and then I put it in D2L.

Once in D2L, the master shells for each course are in the system permanently; they can only be accessed by the instructional designer who copies and pastes them into individual semester shells, which remain available for one year. Instructors can add their own materials into the semester shells, as long as they meet the CC BY license. The instructional designer has set up the gradebook application and manages student access to online materials.

In establishing this working dynamic, the instructional designer put much effort into bringing the faculty on board, as many are very busy with FRCC duties and outside jobs and have neither the time nor the motivation for extra work. Furthermore, many faculty members are reluctant to give up their self-designed coursework for public use. However, despite the initial uphill battle, the instructional designer reports that working closely with faculty and being attentive to their feedback has paid off as support and cooperation from faculty for OER has notably improved from the previous year:

I think some of them still believe that it was just a grant requirement. But when they saw that we have so much diversity in our classes, they actually liked it... In the beginning, it was I [who] was contacting them whenever I found materials. Now, actually, they call me when they find something in OER and ask me to review those materials and ask for my opinion. So, now they are contacting me to help them to create new stuff for them. Cultural shift happening, slowly but surely.

Equipment purchases

In the first year of the new FRCC machining program, courses were held off-campus in a leased high school machine shop, with only three mills and two lathe cutting machines in stock. With the help of the employer advisory committee, the program director has worked to create shop space on campus and to outfit it with the latest, most pertinent industrial technology, including eight CNC machines and several five-axis mills. With growing student enrollment, new equipment may be in the works: currently, consideration is being given to expanding the capacity of some of the machines, such as the surface grinder, and purchasing an electrical discharge machine (EDM).

As of May 2014, the ATC, housing all the manufacturing classrooms and workspace, is fully operational, outfitted with manual and computerized machinery intended to teach a full range of basic-to-advanced courses. A shop technician with 38 years of machining experience manages all the equipment and supervises student NIMS projects. He justifies having older manual machinery as being more cost-effective than the new CNC machines while still being suitable for teaching students the basics of machining and argues that these machines are a good way to learn the basics. This machinery is complimented by new technology so students understand multiple kinds of equipment.

Students served/student perception of program

Students interviewed expressed enthusiasm for and overall satisfaction with the machining program at FRCC.

One student came to FRCC for a mid-life career change from his media, marketing and communications background. He had seen a feature on FRCC in the local newspaper years earlier and made a mental note to himself to consider it. When the time came for a change in professional direction, he returned to the idea of pursuing machining training at FRCC. He has been extremely happy with the FRCC program and had positive things to say about many things, especially the supportive morale of the institution and the practical help available to students transitioning into the workforce:

[A] great aspect of the program is that we have staff here that are actively out there looking for opportunities for students and having an ongoing dialogue with potential employers both for those employment opportunities and also in advisory roles for the program. It seems like there's a great consciousness here of what employers want and how do we tailor or tweak the program to make it more attractive, to make our students more attractive to those potential employers.

Another student came to FRCC after struggling in a mechanical engineering program at the University of Colorado and ended up loving the FRCC machining program, particularly for being so hands-on. He was grateful for the navigator's extensive and persistent help and suggested that the faculty's high professionalism set an admirable standard for the students to follow. The student mentioned that he loved learning the new machinery but that some classes are still in need of improvements, which is expected for brand new curricula: "They're headed in the right direction; they just need to be a little more guided. They're like diamonds in the rough, and they need to just be polished up a little bit more and then they'll be great."

Another student interviewed came to FRCC after having already obtained two separate community college degrees in mechanical engineering and in photography. Being a Colorado native, he had known about FRCC and this time returned to community college to train for a career with a more steady income. Having been a professional bicycle mechanic for a number of years, he felt that the machining program would work well for him. He chose to take credit courses for access to financial aid and the depth of knowledge. Since enrolling, he is thrilled with the FRCC machining experience "from day one." He loves learning on latest technology and stated several times how impressed he is with the caliber of the faculty. When asked for feedback on improving the program, the student expressed the wish for higher accreditation:

I would like to see the program as quick as possible, hopefully while I'm here, to turn into an AAS program so I can get a degree out of it. I'll get my certificates, which is great, and maybe industry doesn't demand much more than that. But I would still like to have it stamped with an associate's degree to add to my other one.

Others also wished to see some adjustments and improvements to the way courses are structured. Two students from the program, both enrolled in non-credit training, mentioned that the “professional curriculum” portion of coursework could be shortened in favor of more shop time. Both expressed the concern that students are paying too much money for a professional machining course to spend several hours on team building exercises and other non-technical skills. Both wished that each class focused on application with a more dominant hands-on learning component, translating into more training “hours” students can put on their resumes. One student suggested having no more than 10-11 students in courses that require gathering around a piece of machinery being operated: with too many people in the way, it is hard to see and hear the instruction.

Faculty/staff perception of programs

According to the project lead, CHAMP has been received very positively by faculty and staff, who have been doing their part to make it successful and cooperating with the navigator’s efforts to keep a close working relationship and maintain frequent communication. The interviewed staff expressed pride about the rapid, effective development of the program and excitement for being a part of it.

EMPLOYER COLLABORATION

Previous employer relationships/how they changed

When the FRCC machining program was still in its conception phase under CHAMP, the director of the program conducted a thorough consultation with 30 local employers to determine the demand for machining labor force and to help build the program in accordance with real industry requirements and future projections. From these interactions, it became clear that the program design should encompass training not only for entry-level workers but for incumbent workers returning for “upskilling.” The employers’ suggestions were instrumental in determining which coursework FRCC would offer, which professional and soft skills are most valued by employers and which new equipment purchases would be most beneficial to the program. The FRCC-employer relationship has only expanded and strengthened since the beginning of the grant.

Currently, local industry outreach is conducted by the employer outreach coordinator who focuses on bringing industry attention to the FRCC machining program as well as tapping local business for employment opportunities for FRCC graduates. This is a position separate from the navigator, though the two work very closely together.

The employer outreach coordinator interacts with the FRCC machining students and the regional businesses, seeking to arrange the best student-employer fit. She consults with the navigator who reports on the students’ personalities, interests and professional goals – and

locates or creates professional opportunities that best benefit those students. Most manufacturing/machining jobs FRCC students find during their enrollment in the college, are solicited by the employer outreach coordinator.

The employer outreach coordinator and the navigator work in tandem to maximize the student-employer connection. For example, the navigator will join the employer outreach coordinator on a visit to the local business and bring the necessary paperwork to make it easier for the companies to become involved:

Sometimes, during a shop tour, people will say, oh, we have a lot of really interested employees. So, I'll make an appointment to come back with the navigator. We bring the applications, paperwork, or marketing materials about up and coming courses. We then register them at their place of employment. This strategy removes that barrier of them having to get off work early, come all the way to campus, to find us, especially with non-traditional, older students. They may have never gone to college and the process is daunting. We remove the fears by assisting them with the enrollment process without them having to miss work to do so.

Overall, the employer outreach coordinator, along with the project lead, have done much to bring awareness to the program and cultivate community ties, by frequenting industry events, speaking at rotary clubs and the economic councils, sending out monthly emails, having a presence in online networking platforms such as LinkedIn and maintaining an active presence in professional associations such as CAMA, Rocky Mountain Tooling and Machining Association and the Northern Colorado Manufacturing Partnership. Recently, the employer outreach coordinator began inviting local industry representatives to visit classrooms and talk about their companies and the types of career opportunities they offer. This approach has replaced the FRCC career fairs. It provides a more focused approach giving the students a better understanding of career opportunities and how the training they are currently receiving applies to industry need. They have found this approach to be a more efficient and effective use of employer time and results in higher placement rates.

Feedback on course changes, equipment purposes, etc.

From the start of the grant, industry partners were engaged in an advisory committee, providing instrumental counsel on creating the state-of-the-art ATC (made possible by CHAMP). Those business allies surveyed their own equipment and reported back to FRCC on what kind of technical skills they wish to see from the incoming workforce, helping determine which technology to purchase, how to set it up, how to position it around the shop, which equipment is best for which purposes, etc.

Future plans for these/other employer partnerships

FRCC is actively involved in joining online platforms, such as Rework America Connected, to expand its networking reach. The college has also had success obtaining scholarships from manufacturing companies such as Gene Haas, bringing financial assistance to non-credit students who are not eligible for government aid – and plans to continue building and expanding professional networks and financial avenues for students.

FRCC will continue to meet regularly with industry partners to discuss curriculum development and industry advancements. These meetings take place on a quarterly basis, usually at FRCC but also at company sites, with “minutes” posted online. At the time of the site visit, the project lead spoke about his intention to conduct a formal survey among all FRCC industry partners – to give them an opportunity to fully voice their impressions, opinions and suggestions and to provide the program with a more consistent, standardized way to collect employer feedback.

NAVIGATOR

Background/role at college

When the navigator began her appointment, she had already been working as a student success coach with the electro-mechanical and technology program, under the Round 1 TAACCCT-funded Colorado Online Energy Training Consortium (COETC). Therefore, the transition to her position as a navigator was an easy and natural one: the job requirements were very similar and she had already established certain relationships with colleagues and the local workforce center. Prior to working at FRCC, the navigator was employed as a case manager for youth in foster care.

Work to date

The navigator’s office is located in the building hosting the ATC, where all machining program courses take place, making it a very convenient location to be available and accessible to students that may need advising. The navigator has an open-door policy between 8 a.m. and 5 p.m., with extra hours by appointment. Some students drop in on their own, others are referred by the general academic advising office, faculty members, employers and the workforce center. The navigator noted that the role she plays in the program is not a traditional advising role. The approach to advising is a student centered one on one approach. She noted that she helps students trying to navigate the college system either for the first time or possibly after a long hiatus.

I had a student who hadn’t been in school in 15 years. I went to his workplace, helped him apply and navigate the college application, email and even payment processes which he found extremely frustrating. Had this personal outreach not been available to

him we would have lost both him and his coworker and possibly the relationship with the business interested in sending them to the machining program.

Student recruitment has been a challenge. The navigator, initially, felt a lack of training in professional development when it comes to student recruiting and marketing but took a lot of initiative in reaching young people through developing a Facebook page, posting ads on Craigslist and visiting local coffee shops, churches and other public establishments to put up fliers advertising the FRCC machining program. She noted that, though recruiting high school students is not part of the CHAMP directive, the high school demographic would make very fertile ground for potential FRCC machining recruits. This can be accomplished using other staff at the school.

The navigator's primary task has been advising students about everything pertaining to the FRCC program and subsequent employment in the machining industry. With new students, it frequently begins with asking pointed questions to help determine the students' academic interests and professional goals – to see whether a career in machining is appropriate for each student. From there, the navigator helps the student decide between the credit and the non-credit program, addresses financial concerns (costs, financial aid options, etc.) and all other inquiries that may come up. With continuing students, the navigator helps with graduation questions, job applications, resume building, interviewing and general professional self-presentation. The navigator also handles everything registration related: from composing the actual forms to helping students fill them out and submit their applications.

When the navigator cannot single-handedly resolve an issue, such as when she is approached by a student with personal struggles, she refers the student a more fitting resource for information or counseling services. In such instances, the navigator always follows up to make sure the student's issues have been addressed.

The navigator reports that, unlike other students she had dealt with in the past, the current cohorts of the FRCC machining program are very job-oriented, when it comes to the kind of advising they seek: they are good at locating academic resources on their own and rely on the navigator primarily for information that will help them secure employment in the immediate future. The navigator estimates that between 75 and 83 percent of FRCC students enrolled in the machining program begin working in the machining sector before the end of their second level of training.

As mentioned earlier, the navigator and the employer outreach coordinator have a very complementary, symbiotic partnership. The navigator handles everything student-related on campus, and the employer outreach coordinator "sells" the program and its students to local employers. As the navigator summarized it:

The employer outreach coordinator creates the connections with employers, letting them know we have trained machinists available for hire and that we have the capacity to

train their employees. Once the connection is made the navigator reaches out to their employees to connect them with the appropriate training, and guides them from registration to completion.

Workforce center collaboration

The navigator created workforce relationships under the CHAMP grant that allowed her to work with three local workforce centers in Longmont, Boulder and Brighton. She spends at least one day per month at each of the three workforce centers. The purpose of this is to share information between the agencies and the college, and to create a personal connection among the agencies, the college and prospective students.

The navigator reports that she routinely refers FRCC student hopefuls who cannot afford tuition to the workforce center where they receive Workforce Investment Act assistance. She stated that students often come for an initial informational meeting not realizing the services available to them and noted that about three to four students a month are referred to the local workforce centers, many of whom find that they do in fact qualify for funding and are able to come back with the financial assistance required to register for classes.

When it comes to TAA and TAA-like students, very few come to the FRCC machining program. The navigator explains this by citing a very low, four percent unemployment rate in the state of Colorado. The very few unemployed individuals who were referred to her by the workforce center did not, in the end, stay with the program or secure stable employment. The navigator believes that those particular individuals had general commitment/work ethic problems that prevented them from finding and keeping a job. Veterans have also been a challenge to recruit most likely due to the geographic location of FRCC and its distance from any military bases.

Future plans

The navigator will stay the course of student advising, looking for more proactive, new ways to bring students to the program. She is particularly excited about the initiative to bring more women into machining, and she is looking forward to establishing a system of female mentorship in the shop and looks forward to the success of the women-only machining course.

CONCLUSION

Challenges to date

Finding qualified instructors has been one of the main problems for the new FRCC machining program, according to the program director. The challenge has been to locate teachers with recent and, preferably, ongoing machining experience with the most recent technology. Furthermore, even with all the necessary technical skills, not all candidates excel at teaching and connecting with students: as the director put it, “[t]hey are just not built for instruction.” As a

former president of a sheet metal company for 20 years, the program director sees skill shortage as an ongoing problem that is likely to remain a challenge in the coming years.

For the navigator, documenting all interactions has been the most challenging part of the job. To track employment data, she has implemented an informal end-of-semester student survey that asks whether the student had a machining job before starting FRCC training (usually, no), if the student has a machining job since the start of training (frequently, yes), where the student is working, whether the student has received a raise, etc. The feedback from these questionnaires provides her with an idea of employment successes of FRCC students and, in the future, she hopes to engage the employer outreach coordinator directly with this data.

FRCC holds student veteran orientations on all its three campuses. The navigator and other staff have made efforts to meet with veteran organizations to build a bridge between them and FRCC but more work needs to be done to create exposure and improve the college's infrastructure to be more receptive to veterans. The format in which allowance/funding for veterans is set up does not lend itself easily to maintaining full-time status. And so, it is a two-fold challenge: first, finding interested veterans, then, getting them into the program.

Student recruitment remains a challenge. The project lead believes that community college student enrollment is vulnerable to fluctuations of the economy and will require innovative strategies to overcome.

Successes/achievements to date

From the conception of the new machining program, the FRCC CHAMP team has fostered a proactive approach towards engaging with the business community and, since her appointment, the employer outreach coordinator has been very successful in building new and strengthening existing relationships between the machining program and the local manufacturing businesses. Thanks to this consistent effort, businesses are more willing to be actively involved with the program. The campus vice president pointed out that some have even campaigned on FRCC's behalf: "We have two-three very passionate employer partners who yell at other employers for not stepping up and supporting us with machines, materials, flexible work schedules for incumbent workers, and even scholarships."

In general, the navigator and employer outreach coordinator team has been such a productive partnership dynamic that navigators from other CHAMP consortium institutions are treating it as a model strategy. By all accounts, the FRCC CHAMP team is an impressively cooperative group of colleagues who work hard to maintain communication and productivity.

The navigator expressed the belief that her position has been beneficial to the students in several respects but especially that it helped streamline the college application process that can be daunting or intimidating to some:

[E]verybody talks about how time-consuming, how annoying and how hard it is to apply to the college and get in and take classes. And the whole process just is so confusing... So, I think creating a streamlined process for them to express interest and to getting enrolled has really made it easy it is no longer some scary thing that students who haven't been in school for 20 years have to go through.

The state of the art ATC with its impressive technology got many mentions from staff and students alike. Strong, quickly expanding ties with the industry are testament to FRCC's value as a leading machining training facility in the region. Offering both, for-credit and non-credit courses in machining makes FRCC stand out from others, drawing in students from far away. The women's only machining course is an exciting development for the program: it is the start of more courses tailored to the unique needs of different segments of the community.

NEXT STEPS

The precision machining technology program's website offers a high-quality short video⁵, showcasing the technology, with testimonials by students happy to be there and satisfied employers who say they look to FRCC for quality machining professionals. The college's focus remains concentrated on boosting recruitment efforts and continuing to develop industry partnerships to strengthen the bond between FRCC and the community it serves.

Sustainability of the new precision machining program post-grant remains a goal and a challenge. The navigator and employee outreach coordinator have done such a stellar job with academic counseling and job placement that there is concern that, if their positions are terminated at the end of the grant, the program could suffer. There is, therefore, interest in re-introducing the navigator and employee outreach coordinator roles on the college-wide level for all CTE-type programs. The program is also looking to expand its space to a larger building next door to accommodate more students and possible new equipment additions. New instructors will be hired, if student enrollment continues to grow. As the campus vice president put it, "We named it Advanced Tech Center with an eye to what else may come along. Because we don't want to limit ourselves just to manufacturing or just machining. We have some ideas about that."

⁵ Front Range Community College: Corporate Training: Machining. Retrieved on January 23. <https://www.frontrange.edu/programs-and-courses/corporate-training/machining>