Colorado Helps Advanced Manufacturing Program

Red Rocks Community College Case Study

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RUTGERS
Education and Employment Research Center

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ABOUT RUTGERS' SCHOOL OF MANAGEMENT AND LABOR RELATIONS

Rutgers' School of Management and Labor Relations (SMLR) is the leading source of expertise on the world of work, building effective and sustainable organizations, and the changing employment relationship. The school is comprised of two departments—one focused on all aspects of strategic human resource management and the other dedicated to the social science specialties related to labor studies and employment relations. In addition, SMLR provides many continuing education and certificate programs taught by world-class researchers and expert practitioners.

SMLR was originally established by an act of the New Jersey legislature in 1947 as the Institute of Management and Labor Relations (IMLR). Like its counterparts created in other large industrial states at the same time, the Institute was chartered to promote new forms of labor–management cooperation following the industrial unrest that occurred at the end of World War II. It officially became a school at the flagship campus of the State University of New Jersey in New Brunswick/Piscataway in 1994. For more information, visit smlr.rutgers.edu.

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Rutgers' Education and Employment Research Center (EERC) is housed within the School of Management and Labor Relations. EERC conducts research and evaluations on education and workforce development programs and policies. EERC research expertise includes community colleges, state and federal workforce developmental systems, skills development, college completion, and innovative and technology-based educational programs.

INTRODUCTION

The Colorado Helps Advanced Manufacturing (CHAMP) project 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 across the state of Colorado. CHAMP is a consortium of eight community colleges and one four-year institution across Colorado. The consortium includes 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 (CAMA) identified two gaps in academic training programs previously designed to meet the needs of the industry: 1) the lack of a consistent industry voice about their needs and 2) the absence of a strong network to facilitate business-to-business activity partnerships with educational institutions. To address this economic situation and make Denver and the state of Colorado a leading advanced manufacturing hub, the CHAMP project was conceived. CHAMP is in place to increase the attainment of degrees and certifications in manufacturing in order to best serve employers' needs. CHAMP programs are designed to produce 21st-century workers whose skills align to local market trends; community colleges work with employers to align programs with industry-recognized skills and competencies. One of CHAMP's primary goals is to create innovative flexible learning opportunities for students. The grant called for schools' existing courses to be adapted for hybrid delivery, where a portion of the traditional face-to-face instruction is replaced by web-based online learning. In addition to designing/redesigning advanced manufacturing programs/courses to a hybrid format, each college is required to integrate open education resources in its CHAMP curriculum, as well as integrate a CHAMP-funded navigator.

Open education resources (OER) are teaching tools and resources that are licensed for free, public use. They include 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 re-purposing by others. OER includes full courses, course materials, modules, textbooks, streaming videos, tests, software, and 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/redesign of their online or hybrid courses. Consortium colleges are also required to create or redesign their courses/programs so that they can be packaged and licensed OER for use by other educators and institutions. CHAMP colleges will package, license, and post their course material during the course of the grant.

Each college in the consortium is required to employ at least one navigator (college staff may choose to hire one or more persons to fill the role of navigator) to collaborate with employer partners, local workforce centers, community and nonprofit organizations, and students to ensure student access to CHAMP resources and student 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 students in multiple ways as each institution designates. Navigators also track their interactions with students to report outcomes based on a model of "intensive advising," assisting students throughout their education with multiple interactions and points of intervention to ensure student 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 into program curriculum or institutional use. The process at each college for awarding students credit for prior learning will also be redesigned at each college, following the consortium-created policies.

This report is one of nine created to highlight each individual college's contributions to the CHAMP project to date. The purpose of this case study is to provide a summary of RRCC's activities, successes, and challenges through the fall semester of 2015 and to identify the implementation processes and unique contributions of the college to the CHAMP project 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 RRCC, its student population, and its service region. These sections are followed by a) a summary of the goals of RRCC's CHAMP program, b) a discussion of the implementation of the program(s) including the design process and incorporation of open education resources, c) student and faculty perceptions of the program(s), d) employer and workforce center collaboration, e) the navigator, f) consortium-level innovations including MOOCs and credit for prior learning, and g) a summary of successes and challenges to date along with next steps.

METHODOLOGY/DATA SOURCES

This report examines the development and implementation of the first two years of the CHAMP grant at RRCC (through fall of 2015), 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 have

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

RRCC has two campuses in Lakewood and Arvada, Colorado, cities located in the greater Denver metropolitan area.[1] The Arvada campus is home to the health sciences programs and degrees, and the Lakewood campus offers a full range of courses and student support services. RRCC prides itself on its innovative and rigorous academic offerings, which include professional development courses, certificates and degree programs.[2] RRCC values high quality and accessible teaching, as well as flexible course offerings in high-demand career fields.[3] The college offers Associate of Arts (AA) degrees, Associate of Science (AS) degrees, Associate of General Studies (AGS) as well as Associate of Applied Science (AAS) degrees.[4] In spring of 2014, the student body comprised 9,235 students, 68 percent of whom were part-time (N=6,280). The female to male student ratio was about equal (49.89 percent and 50.8 percent respectively), and most of the student body identified as white (72 percent), with 14 percent of students identifying as Hispanic (N=1,293). About 56 percent of students were younger than 25 years of age (N=5,172).

RRCC'S CHAMP GOALS

CHAMP provided RRCC the opportunity to leverage what the institution had already built during round one of the TAACCCT grants—lessons learned from the first grant regarding curriculum design and hybrid delivery were applied the third round. CHAMP staff planned to transition advanced manufacturing courses to a hybrid platform, allowing students to decrease

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[1] U.S. Census Bureau (2015, December 2). *U.S. Census Bureau: State and County Quick Facts.* Retrieved December 26, 2015, from U.S. Census Bureau Website: http://quickfacts.census.gov/qfd/states/08/08059.html.

[2] Red Rocks Community College. *About Us.* Retrieved December 26, 2015, from RRCC Website: http://www.rrcc.edu/about-us.

[3] Red Rocks Community College. *About Us.* Retrieved December 26, 2015, from RRCC Website: http://www.rrcc.edu/about-us.

[4] Red Rocks Community College. *Degree and Certificate Programs.* Retrieved December 26, 2015, from RRCC Website: http://www.rrcc.edu/degrees-certificates.

the time spent in classrooms and increase the time spent working in a hands-on setting. Successes during the first round of grants, in which staff redesigned similar hands-on industrial courses to hybrid and online formats, served as an impetus for expanding the options for non-traditional, working students to further their technical education. A second—interlaced—goal of the institution was to build on a partnership with Warren Tech, the premier career and technical education (CTE) adult learning center associated with Jeffco Public Schools.[5] RRCC staff saw CHAMP as a great opportunity to strengthen their AAS degree in advanced manufacturing and their partnership with Warren Tech by expanding the combined RRCC/Warren Tech precision machining program. Key to the expansion was the addition of new advanced manufacturing equipment and the renovation of shop space for adult students, both of which required funding. The grant also offered RRCC the ability to add new equipment and skills that are in demand. With the addition of the Swiss Screw machine, 5-Axis, metrology, and Wire EDM, the program added new certificates and evening courses.

RRCC's institutional goals for the CHAMP grant were grounded in the larger sector needs for the area. In the Denver metro area, occupational sectors for which manufacturing jobs are critically important rival national figures in terms of percentage of total employment. Additionally, hourly wages for some of these jobs outpace national averages. This demonstrates the Denver area's strong commitment to occupations that are supported by the manufacturing industry. The architecture and engineering sector makes up 2.7 percent of the Denver metro area's total employment, compared to 1.8 percent nationally. The average hourly wage in Denver for jobs in architecture and engineering is $43.14, compared to the national wage of $39.89. The construction and extraction sector comprises about 4.7 percent of total employment in the Denver metro area, compared to 4.0 percent in the United States. Additionally, although the production sector makes up only 3.7 percent of the Denver metro area's labor force compared to the national percentage of 6.6 percent. Denver's hourly wage for this sector is $17.71, roughly equivalent to the national average of $17.41.[6] By targeting programs with a regional need for skilled employees, RRCC hoped to increase enrollment through their institution for manufacturing education and training, which would make it a local and national leader in providing skilled labor for this industry.

IMPLEMENTATION

RRCC originally targeted its precision machining technology program, which included quality control. Within six months of the implementation process, the project lead realized adding another program to the CHAMP redesign would strengthen the implementation, increase grant

[5] Red Rocks Community College. *Precision Machining.* Retrieved December 26, 2015, from RRCC Website: http://www.rrcc.edu/precision-machining/rrcc-warrentech.

[6] U.S. Department of Labor: Bureau of Labor Statistics (2015, May). *Occupational Employment Statistics.* Retrieved April 27, 2016 from http://www.bls.gov/oes/current/oes_nat.htm#51-0000 and http://www.bls.gov/oes/current/oes_19740.htm#51-0000. Note: Total employment percentage in the Denver metro area and nationally was derived by calculating the number employed in the specified major occupational groups from the number employed in all occupations.

counts, and offer additional value to students. At that point, the decision was made to also include the engineering graphics program as part of the CHAMP project. Implementation of the engineering graphics program had just begun at the time of this report, with the primary changes yet to come. As of fall 2015, precision machining's redesigned quality control certificate courses had been completed and was finishing its first run with students in the courses. Implementation efforts for each program are detailed below.

Design/Redesign Process

Precision machining. RRCC grant staff planned the redesign of the precision machining program in stages. First, a number of certificates were reorganized to ensure program completers. Grant staff then submitted a subsequent program approval application to include the Swiss Turn, Wire EDM, 5-Axis, and Metrology courses and certificates into the degree. The new courses were created, the second program approval was submitted, and the fully redesigned program—including the new classes—will debut during the 2016-2017 school year.

There are two schedule "tracks" to the precision machining program: a daytime option and an evening option. Although the learning objectives and course materials are the same, the daytime courses occur at a slower pace and meet more often. The evening courses are faster paced, including a "blended" course which combines three courses into one streamlined course (discussed in detail below). Evening courses meet twice per week and are designed for students who are working while attending school.

Engineering graphics technology. Although a late add to RRCC's CHAMP project, the engineering graphics program will benefit from redesigned courses, allowing students to use in-class time for hands-on application, and the addition of new equipment. CHAMP funds will be allocated towards the purchase of a 3D printer, and the CHAMP navigator will also serve this program and its students.

To design/redesign the courses for both programs, the CHAMP project lead and instructional designer worked with the primary engineering graphics faculty member and four instructors. The primary faculty member had previous experience implementing the hybridization of courses for other programs; likewise, the instructional designer had experience working with RRCC's round one TAACCCT programs in transitioning courses to online and hybrid formats. This experience helped in the design/redesign process, since they already knew what elements of a course could easily be transitioned to a computer-based format and where to look for online resources. Additionally, an institutional push to increase technology in teaching has helped in bringing faculty members on board to redesign courses. The instructional designer noted "as an institution, RRCC has really been focused on instructional design technology." Having administrative encouragement can help faculty embrace the change.

The project lead and instructional designer noted that it has been somewhat difficult accommodating the busy schedules of faculty. Since faculty members also work in the industry

as well as serve on industry committees and participate in various other volunteer and community organizations, their time is precious. In many cases, the instructional designer had to modify meeting times or wait until faculty members were available to discuss curriculum changes.

Part of the overall CHAMP grant structure at the consortium level included the creation of several courses by other grant institutions. For this reason, the majority of RRCC's implementation process has centered on receiving, reviewing, and adjusting curriculum content from other colleges for implementation at RRCC. The majority of this process was completed by the primary engineering graphics faculty member and the instructional designer. Most of the conversion process involved reviewing content to be sure it matched with the programs' learning outcomes, as well as eliminating content that was designed for equipment RRCC does not have. During the process of running the courses, the instructional designer and faculty members met weekly to discuss any changes or "tweaks" the courses would need before running the next semester.

Student Recruitment/Outreach

At the heart of RRCC's implementation process is an intense focus on increasing student recruitment in order to fill industry need for qualified employees. Shortly after implementation began, the daytime program had a waitlist; the evening courses were more difficult to fill as of the time of this report (fall of 2015). In part this was a result of many of the evening courses being brand new and still awaiting approval for the AAS pathway. While CHAMP staff members are hoping the evening courses will fill faster once the approval is complete (by the 2016-2017 school year), they are still pouring considerable efforts into trying various methods to reach students. These include advertising on industry Facebook pages as well as the school's Facebook page, creating brochures and flyers, redesigning the website, reaching out to employers for incumbent workers, participating in community events, and networking to increase word-of-mouth advertising. The full-time navigator sent a letter and flyer to daytime students who had enrolled at RRCC from 2010 to present to say "hey, we have these new classes," thinking some students might be interested in continuing their education. The school is also participating in collaboration efforts with the Colorado School of Mines to increase relationships with and outreach to students. Once a year a CHAMP faculty member hosts welding classes there to engineering students to help them gain hands-on skills and learn how to weld. Staff report this has created strong relationships with students there. The project lead noted CHAMP staff members are "trying many things to see what's going to be the most effective." While recruitment strategies for fall semester 2015 were ultimately successful (14 students enrolled), CHAMP staff still feel that recruitment efforts are slow and more needs to be done to increase student enrollment.

Stackable certificates

Reinforcing stackable certificates and creating flexible learning environments for students was a driving force underlying implementation efforts for both of the programs and was a direct response to industry needs. Engineering graphics has multiple entrance and exit points, allowing students the flexibility to gain as many or as few certificates as they need for job training, but the multiple certificates also allow students to gain confidence by earning certificates in steps.

RRCC's precision machining primary faculty member believes "blending" multiple courses into seamless learning also mimics the real world. In "real life" machining jobs, students "do not learn how to read blueprints for six weeks and then go build something," the faculty member noted; everything is done at the same time. He prefers his courses mimic a true work environment, feeling students benefit from RRCC's unique "blending" of three core precision machining courses into one seamless class, as well as the ability to stack multiple certificates for a better-rounded outcome. A new course is currently being created to blend multiple daytime courses into one seamless 2-semester, project-based course. Students will use different equipment during the year, learning how to make a fly wheel. This process of blending core courses into one seamless course is unique to RRCC. The instructional designer invited CHAMP instructional designers from across the consortium to come to RRCC to tour the facility and see the blended course in action. She said the instructional designers were all impressed at how the instructor was able to combine the learning objectives for all three courses into one class. They collectively agreed that this teaching method was much more reflective of "how things really work" in a real work environment.

Open Education Resources

The instructional designer and the primary precision machining faculty member worked together on the blended courses as well as the other program courses to publish them as OER. The project lead and instructional designer have addressed concerns from faculty regarding openly sharing their content. Faculty members are sometimes reticent to embrace collaborative curriculum development. CHAMP collaborators at RRCC have encouraged faculty to embrace the idea that they don't always have to reinvent the wheel and can incorporate consortium curriculum and other outside knowledge into their courses.

Student Perception of Programs

Students have seen positive changes in the precision machining program. They have reported enjoying increased flexibility of course offerings, especially the fact that evening classes are now being offered for those students working during the day. Students also enjoy the newly renovated workshop space. Warren Tech provided new computers that can be used on campus and new software that can be used at home for design work, as well as the addition of simulators. The addition of these materials has helped facilitate the learning process a great

deal. Additionally, the instructors have enhanced the student experience greatly by patiently assisting them with their adjustment to curriculum changes. Some instructors have also facilitated a collaborative learning environment where less advanced students are learning from more advanced students. One student noted that "teaching is really good this year. Second year students help first year students to learn how things really work. Anyone who has problems sit with others and try to figure [it] out." Some second-year students who have expertise on a particular process or machine also work part- or full-time in a shop, offering their knowledge and expertise to inexperienced students as a resource.

Precision machining students are most pleased with the equipment purchases and renovations to the program's workshop. The new equipment increases learning aptitude for many students. They enjoy being able to have machines to themselves, as opposed to having to take turns sharing equipment. Students also enjoy the autonomy the program provides, which is facilitated by the new machinery and software purchased as part of the CHAMP program. Suggestions for improvement include the addition of nighttime computer numerical control (CNC) lathe courses, as well as recruiting more women into the program.

Machining students have had somewhat mixed reviews of the hybrid/online portion of the program. However, the downside or challenges experienced are not unique to the CHAMP program specifically, but rather to online education in general. For example, students find it more difficult to stay motivated when working individually on a computer, compared to working in groups in the shop. Different learning styles are not always adaptable to online formats, particularly for older students who may not be as familiar with new technology and computers. Although hands-on learning might be a preferable teaching style for students, the online component helps tremendously in empowering them to self-teach and supplement classroom instruction. Some students prefer the online setting to hands-on as it allows for increased flexibility and ownership of the learning process. "Online is very good. Hands-on can be tiring. It is nice to go online at home, the coffee shop and other places. I use the online resources a lot."

Although the engineering graphics program was a new addition to the CHAMP grant at the time of this case study, students were already expressing their excitement about having access to the CHAMP navigator. It was definitely clear to EERC team members that students in these courses perceived a high value in having access to career readiness services and help with job preparation skills. The addition of the soon-to-be-delivered 3D printer was also much anticipated. Students reported how excited they were and how much easier their work would be with the latest technology.

Faculty Perception of Programs

As is often the case when programs are transitioned from a traditional, face-to-face format to a hybrid format where some course content is placed online, some faculty members are wary of the transition. Especially in courses that are primarily technical in nature, such as machining,

some faculty members were initially unconvinced that converting some content to an online format was a good idea. Additionally, although RRCC uses the Desire2Learn (D2L) online learning platform for all of its courses and programs, most of the technical faculty members had not previously used it. Therefore, the learning curve for these faculty members was even higher. CHAMP's primary instructor for precision machining took the lead in introducing D2L to faculty members and helping them through the learning process.

The CHAMP project lead and instructional designer had both previously worked with faculty during round one of the TAACCCT grant; therefore both had experience in helping technical faculty overcome their fear of the process. Additionally, they were able to explain to faculty that by putting some of their classroom content online for students to do at home, they were actually freeing up more time for hands-on learning while they were on campus. The instructional designer said she told faculty to put as much of the "passive" material—reading, videos, etc.—online as possible, "that way when you walk into a welding shop, you can weld." The project lead echoed this saying faculty members really started to realize that "what we put online frees up their time in the classroom."

Some faculty members have really embraced the concept that putting their classes online can be beneficial to student progress. RRCC has made great strides in terms of increasing faculty acceptance of online/hybrid learning and collaborative curriculum development, especially considering the fact that they are working within a technical industry. The primary faculty member for the precision machining program has been instrumental in getting other faculty on board. They also have broader institutional support with the distance learning department and the RRCC's instructional designer. The instructional designer commented that collaboration is the best way to encourage faculty to embrace the change:

> I think that we'll always have to work with people to help them understand…how the hybrid course works, particularly in the career and tech areas…And show them examples of what kinds of assignments and things we could put online and then help walk them through, okay, once your students do this online, then this eliminates you having to do XYZ in the classroom so that you have more time to do the hands-on piece.

Overall, faculty members have been very supportive of the program changes and in many cases have pitched in to recruit students. For example, one faculty member volunteers to barbeque for military events, feeding the attendees and also talking to them about the certificates and programs. As a result, about 10 percent of his students are military students. Since faculty are also working in the industry, they have close ties to employers and industry connections. Faculty are proud of their programs and do a great job spreading the word of how their programs can prepare students for jobs in advanced manufacturing. CHAMP faculty members are responsible for industry engagement of employers in making curriculum decisions, recruiting incumbent workers, and placing student graduates.

EMPLOYER COLLABORATION

RRCC has historically maintained strong industry relationships and continues to do so through the CHAMP grant. One way industry is connected to the CHAMP programs is through the CHAMP advisory committee. This committee comprises representatives from industry who are looking to the program for potential employees. The committee is also deeply engaged in curriculum development. These committee representatives have been instrumental in equipment selection and purchasing.

Some employers, however, are unsure of the value of the CHAMP certificates. Since the certificates themselves are not necessarily a requirement for advanced manufacturing jobs, there is some uncertainty about how exactly the CHAMP program will directly benefit them. However, employers are excited to see where the program goes and are very supportive of its growth. Employers have commented that the training is what is generally important to them, not necessarily the acquisition of certificate(s). Project staff found that even with hesitation from some employers, they are "still looking to the programs for employees." Students from the precision machining program find employment very quickly, and often do not even have time to prepare a résumé before finding a job. Overall, employers are very positive about the level of training students are receiving through the CHAMP programs so far, and also respect the instructors.

Since the instructors also work in industry, they are natural conduits between the school and employers. The project lead stated that the primary precision machining faculty member "has forged, built, and maintained relationships with employers" and acts as a liaison between employers and the programs. Generally, RRCC has established active and consistent industry participation. These partnerships will continue and industry benefits from the CHAMP program will continue to emerge over time.

WORKFORCE CENTER COLLABORATION

Both the CHAMP project lead and a RRCC administrator have had solid existing relationships with the workforce center in the past. Additionally, the navigator worked extensively with the local workforce center during round one of the TAACCCT grant. All three, however, acknowledged that the economy was better and no applicants were coming from the workforce office. Regardless, the administrator believes a "permanent" workforce liaison is necessary and will help build a stronger, long-term relationship with the workforce center. As the director noted, "It's important to have a point person for the college to say [to workforce center staff]: It's important that we work with you. It's important for the students." This is especially true considering that the short CHAMP certificates that prepare students for immediate work are a perfect fit for workforce referrals. As of November, 2015, the administrator had been appointed to this position and was beginning to plan how she would foster the existing relationship and make it stronger. A major challenge in building a lasting relationship with the workforce center has been high turnover of staff at the local office. But the administrator has a long-standing

history of working with the center, and was instrumental in creating relationships with RRCC's second round TAACCCT grant in the healthcare sector.

Relationships with the local workforce center are critical to technical programs such as CHAMP. In technical fields, individuals need to go through specific training suited to their industry area before they are employable. There is a significant gap between those who are interested in manufacturing and those who possess the skills to be employed in the field. Thus, the workforce center and the CHAMP programs rely on each other to fulfill their roles. CHAMP's project lead also hopes an expanded relationship with the workforce center will help create more strategic career pathways for students in the programs.

NAVIGATOR

RRCC, along with a few other consortium colleges, hired multiple people to fill the role of navigator. At the time of this report (fall 2015), RRCC hired an industry manager to fill a part-time navigator position focused specifically on building employer relationships and expanding the internship program. The full-time navigator focuses on working with CHAMP students throughout their program(s), soft-skills training, tracking data, and creating training videos. Although both navigators have separate roles, they also work together recruiting students, meeting with employers, and creating opportunities for students.

Background and Current Work

The full-time navigator was previously a career coach for round one of the TAACCCT grant at RRCC, and thus brings with her a wealth of information about TAACCCT, the process, and—most importantly—how to assist students. She often visits the precision machining students, making sure students are aware of her and the things she can help them with. Many of her responsibilities require similar skills to her role as career coach in round one. There have, however, been notable differences in her role from rounds one to three. In round one the career coach's main focus was on career readiness. In round three she has focused more on recruitment/outreach and development, including website design, creating fact sheets and focusing on academic advising and financial aid help for students. The navigator noted that in the first round, students were older and many were preparing for a second or third career. Students in CHAMP programs are on average younger, and since they were just beginning their programs at the time this case study was written, many were not yet ready for career counseling. In addition, many students in the precision machining program are incumbent workers; they do not need career readiness training. The addition of the engineering graphics program, however, was already changing things. Even though the navigator had only just introduced herself to the students, several had already set up appointments to come see her for résumé building and interviewing skills. When EERC team members talked to engineering graphics students, many were excited about having the navigator available to them for career readiness.

The part-time navigator was new to the TAACCCT process at the time of her hire but brought with her a wealth of experience working with employers and establishing business relationships. A big part of both navigators' roles is to expand the internship opportunities for CHAMP students. The part-time navigator met with the RRCC internship department during the summer of 2015 to iron out summer internship opportunities for interested students. Along with the full-time navigator, she worked to reach out to students who might be interested in gaining credits through a summer internship. Out of five interested students, one followed through with the internship last summer. The part-time navigator and a representative from the employer hosting the internship worked with this student directly in preparation for this internship. The student reported an extremely positive experience, and is hoping to participate in two more internships throughout the course of her program, for a total of three credits. She explained the "hands-on learning" was the best part of her experience, and she learned "so much more there in a short period of time" than she thought possible. She also thinks the work experience will help her when it's time for her to find employment.

The navigators report that most students are very enthusiastic about their CHAMP program. Many students that the navigators work with are experiencing community college for the first time. These students often need more groundwork in terms of the application process, help with financial aid applications, and achieving work/life balance. Without this help, many students may not have the confidence or the skills to get started.

Massive Online Open Courses

Consortium-wide, three MOOCs have been created for use in CHAMP programs: math, credit for prior learning, and student success. The full-time navigator at RRCC worked on the navigator committee to develop the student success MOOC. Navigators at consortium schools were paired together to develop the materials for the MOOCs, each pair completing a different section. While the process went smoothly, collectively the navigators felt the timeline for producing the MOOC was rushed, and they weren't able to design them as user-friendly as they had hoped. Because of this, RRCC's navigator has used parts of the student success MOOC, but not the whole MOOC in its entirety since students would have to come in multiple times per week to work through the entire MOOC. Since the evening classes only meet twice per week, this is problematic in terms of timing. Trying to fit the entire MOOC in to a student's schedule is challenging. RRCC's navigator has instead used modules of the MOOC rather than the whole thing, which allows students to get "highlights" of the training. Students in the evening precision machining classes are given access to the MOOC through D2L, which is convenient since they have access to computers in their classrooms. For daytime students, she has to sit down face-to-face with students to complete the modules. Both navigators are requiring students to complete some of the student success MOOC prior to completing an internship.

There has also been some interest in the math MOOC at RRCC, although it is not currently being used in the CHAMP programs. Since RRCC does not offer Math 108, the MOOC is a good

supplement for some programs. For example, the HVAC program is considering the MOOC as a supplement to courses or replacement for the math requirement.

PRIOR LEARNING ASSESSMENT

A RRCC staff member who works in the assessment center sits on the CHAMP consortium subcommittee that makes decisions about the grant's credit for prior learning process. According to this staff member and the CHAMP project lead, the consortium's work on prior learning assessment is making it easier for students to apply credit for their prior workplace learning and is streamlining the process. Prior to the CHAMP grant, RRCC primarily used the challenge test system as prior learning assessment. RRCC staff members are planning to use the new credit for prior learning guidelines to roll out new recruiting efforts for the CHAMP programs and the institution as a whole. The project lead is hoping that these recruiting efforts will attract more incumbent workers to RRCC programs. They do not anticipate that there will be a dramatic change in RRCC policy based on the outcome of the subcommittee meetings, but they are excited for the recruiting possibilities and are planning a recruiting push once guidelines are concrete. For example, staff will be producing short videos that will be used as a recruiting tool to educate potential RRCC students about the opportunity. Advanced manufacturing and engineering graphics students have not historically utilized credit for prior learning, but staff are hoping to use prior learning assessment as a recruiting tool to not only get more students to use them, but also to enter and complete the advanced manufacturing programs. The project lead stated that one of the CHAMP faculty members feels prior learning assessment is also great opportunity for CHAMP programs to build relationships with industry: "[He] really likes it. I think he sees it as an incredible outreach opportunity for his program, and it's a great way to network with the local industry."

Prior to CHAMP did not have much incentive to go back to school and acquire new manufacturing skills, or for employers to sponsor them. Courses were not streamlined or designed in a way that would build skills that were directly transferable to industry. However, CHAMP staff suspects that having stackable courses and a new prior learning assessment structure will make the credentialing process less cumbersome and more appealing for students and employers. They plan to market the concept of prior learning assessment to employers and students, especially those in the evening classes—most of whom are already working, thus already have some of the basic skills. The project lead and full-time navigator said that, in many cases, students might be able to gain enough credit for prior learning to skip one class, and then just take the remainder:

> Our challenge with the industry is that these certificates really aren't needed…But if you could say…"we'll PLA it as much as we can" [apply credit for prior learning for those skills students have already learned on the job], then that's going to save time and money, and that might make it more appealing to that individual or that employer to send somebody to enroll in this program.

Although the credit for prior learning process had not yet been fully completed by the CHAMP subcommittee at the time this case study was written, RRCC staff members were eagerly awaiting it.

Continued student recruitment/outreach. Both navigators are brainstorming methods to boost recruitment, continuing this as a primary focus for grant staff. For example, the navigators plan to experiment with creating a weekend course that would be more conducive to the schedule of students who are working, have families, or both. Additionally, as previously mentioned, the completion of prior learning assessment policies at the consortium level will provide RRCC with strategies for outreach and recruitment of both students and employers.

Engineering graphics program. RRCC's full-time navigator is excited to begin working with engineering graphics students who need a lot more hands on career support. Students in that program have already expressed a need for career and industry support.

CONCLUSION

The CHAMP grant has helped RRCC broaden their program goals and expand their advanced manufacturing reach tremendously. The focus on developing industry partnerships has created the challenge and opportunity to tailor program requirements to both students and employers' needs, thereby increasing student success, matriculation and employment. Below are some challenges CHAMP staff have worked through to date and areas they have identified for continued development, which staff are working diligently to address. Also included below are the program's successes to date, of which CHAMP staff expects there to be many more.

Challenges to Date

Delayed funder approval for building renovations impacted grant implementation setting implementation efforts back by six months. Equipment purchases could not be made before building renovations were complete. The floor plan for the existing shop had to be reconfigured to accommodate the new machinery. Once the 5-Axis and Wire EDM machines were delivered, old machinery had to be removed to make room for the new additions. Other shop renovations t were made to accommodate the new machinery and the hybridization of courses, including audiovisual equipment to support online learning. Therefore, program implementation was stalled as there was no space for students to work in or equipment for them to work with. Courses could not be offered without these vital elements, which certainly impacted evening enrollment. Despite this setback, CHAMP course enrollment did not fall short of RRCC's targets. Bringing the engineering graphics program into the CHAMP grant helped to address this area of concern.

Student recruitment has been somewhat challenging for CHAMP staff, especially for the evening precision machining program. Additionally, some employers do not pay for the

training, and sometimes students can't afford the programs. Staff members continue to try various outreach campaigns, and also take the challenge to employers, saying: "you wanted us to have these classes; can you meet us half-way and help us recruit students?"

There have also been general challenges with curriculum development, particularly regarding courses created at other schools and implemented at RRCC. Courses created at other schools are sometimes not perfectly aligned with specific details of RRCC's CHAMP program or equipment and, therefore, aren't always a perfect fit. The CHAMP instructor and instructional designer have to "tweak" course material to adapt it to RRCC's needs. RRCC also had to make some adjustments late in implementation to create some courses that CCD had intended to create. The budget had to be adjusted to create the Wire EDM and 5 Axis courses.

Successes/Achievements to Date

Once equipment purchases were completed for the renovated manufacturing shop, they were the highlight of the CHAMP precision engineering program. The new equipment allowed RRCC to develop completely new courses and course material, and redesign existing courses. CHAMP staff members are particularly proud of the collaborative effort it took to produce the programs and the overall product once the process was complete:

> We talked about the inherent challenges of working with people [instructors] who work 60 hours a week – getting it done. But we got it done. It's done. We've got the Swiss classes. We've got the Wire EDM classes. We've got the quality control classes. So that's pretty exciting.

Aside from tangible resources such as equipment, less tangible resources have also made a big impact on the CHAMP programs and the institution broadly. For example, the grant has brought numerous training resources for faculty, such as training on how to develop hybrid courses, how to transition "traditional" courses to online formats, and the differences between online and hybrid teaching (and learning). Since RRCC is focused on redesigning as many programs as possible at the institution (even beyond grant programs), this additional training has been invaluable.

Establishing internship sites has been another big success for CHAMP staff. Early efforts established six or seven internship sites, according to the full-time navigator. She can see this expanding as more students begin to take advantage of the opportunity. The employer site that hosted the first internship last summer (summer of 2015) was extremely positive about the experience and looks forward to hosting more.

NEXT STEPS

As the grant period progresses, RRCC is shifting focus from implementation efforts to streamlining and "tweaking" the existing curriculum and programs, and strengthening industry and workforce relationships. Continued efforts are also planned for student recruitment and to find "that magic way or ways" to get students into programs. Overall, the project leads feels collaboration between faculty members, the instructional designer, navigators, and other program staff have been instrumental in the successful implementation of the CHAMP programs.

In the next steps of the CHAMP project, RRCC seeks to make up the time lost due to delays in equipment purchasing/installation, building renovation and curriculum development in the consortium. The project lead's plans are focused on getting all CHAMP certifications aligned with industry needs. A top priority is making sure all certificates are stackable in order to increase the number of students who complete the programs. The CHAMP project lead and instructors are working together to build the new courses into precision machining degree pathways. They are working to create a well-defined set of stackable certificates that fall within the degree pathway to make things a little easier for students. Additionally, CHAMP staff members want to make sure the internship portion of the program is also built into the degree pathway.

CHAMP staff members are focused on the sustainability of the programs and key staff past the life of the grant. Beyond career pathways, staff members feel industry relationships are key to sustaining the programs. After the grant period is over, the CHAMP project lead hopes to transition the internship coordinator position into a faculty position that would facilitate student internships. Employers who offer internships would have the ability to communicate with instructors on areas of progress and areas that need improvement based on the student performance. This feedback will allow faculty to modify course curriculum on an ongoing basis based on industry feedback through first-hand observation of student skills in an internship setting. Overall, program recruitment, curriculum and pathway development and increasing industry partnerships are top priorities for RRCC CHAMP staff moving forward.