Colorado Helps Advanced Manufacturing Program

Aims Community College Case Study

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RUTGERS
Education and Employment Research Center

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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 Aims and to provide a summary of the Aims 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 Aims, its student population, and its service region. These sections are followed by a summary of the goals of Aims'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 Aims; 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 Aims, 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

Aims Community College, a non-residential public college established in 1967, serves Weld County in the Front Range region of northern Colorado. Its main 175-acre campus is located in Greeley, with three satellite campuses in Windsor, Fort Lupton, and Loveland. In Fall 2014, Aims had 5,001 enrolled students, 37 percent of whom attended Aims full-time while the other 63 percent were part-time students. The student population is 57 percent female and 43 percent male with 61 percent of students self-identified as "Caucasian/Non-Hispanic", 32 percent as "Hispanic" and 7 percent as "other".

Aims offers over 160 degrees and certificate programs annually. The 17 Associate of Art (AA) and Associate of Science (AS) degrees have coursework specifically designed to assist students in transferring to a 4-year university. Aims also offers a wide variety of Associate of Applied Science (AAS) degrees (40) and certificates (136) intended to help students transition into targeted employment after college. Aims offers the lowest tuition in Colorado for Weld County residents. Aims prides itself on being a Hispanic-serving institution, with 32 percent of its student body identifying as Hispanic. It was voted a "Military Friendly School" in 2014 by Victory Media for helping veterans transition to higher education. Sixty-three percent of students attend Aims on a part-time basis; 56 percent of students at Aims receive financial aid.

AIMS'S CHAMP GOALS

As one of the nine consortium recipients of CHAMP, Aims occupies a region abundant in engineering, manufacturing, construction and clean energy industries. CHAMP provided an opportunity for the college to further develop education and credentials in these industry sectors. Aims's efforts in CHAMP sought to align with the goals of the larger CHAMP consortium. These goals are mentioned here and discussed in more detail in the sections that follow.

The first of the four primary goals for Aims under the CHAMP grant was to establish and advance college-industry partnerships. From the start, one of Aims's main objectives under CHAMP was to strengthen industry representation in the advisory committees for each of the three manufacturing programs redeveloped under CHAMP and discussed below. The advisory committee for the building/construction site management program had already been successful, but the other two – manufacturing technology and engineering technology programs lacked involvement from their respective sectors. In the first two years of the grant, the navigator at the college took on this task.

The second goal for Aims under CHAMP is to spearhead technologically advanced education. Aims sought to achieve this through two avenues: renovating facilities/purchasing new technologies and diversifying coursework into a variety of technology-assisted formats such as hybrid courses and regular online course. Due to approval delays, Aims skipped renovations and focused on purchasing equipment and hiring two laboratory technicians. An instructional designer was also brought on to help faculty transform their teaching materials into digital "master shells" to be made available on the OER.

The third primary CHAMP goal for Aims is to work with the system and CHAMP consortium to redesign the credit for prior learning (CPL) policies to grant students academic credit for skills and knowledge obtained outside of the education system – through life experience, employment and certain specialty skill-sets, such as military training. A consortium-wide subcommittee on CPL has been formed: Aims is participating in the discussion but is yet to move past the theoretical stage.

The fourth primary goal at Aims under CHAMP is to develop and redesign education and credentials in the manufacturing sector. They did this by creating and redesigning coursework and introducing structures and mechanisms for stackable/latticed certificates and articulation. Through CHAMP, Aims is working to develop and improve credentials and educational pathways within their Department of Applied and Environmental Technologies (AET).

Local manufacturing industries had pushed Aims to increase and improve the production of trained professionals ready to be hired. Under the CHAMP grant, Aims's AET department offers three degree/certification programs: 1) manufacturing (industrial) technology, 2) engineering technology/computer aided drafting (CAD) and 3) building/construction site management. All of these programs existed prior to the grant but the three have, since, benefited from a range of improvements: from vital equipment upgrades to the budding professional opportunities made possible by the efforts of the navigator under the CHAMP grant. These are discussed below.

Manufacturing (Industrial) Technology. Aims offers four levels of certifications within its industrial technology AAS and each credential can be stacked into the machining programs at four other consortium colleges. These certificates can also stack into the industrial maintenance program at CCD or the engineering technology program at PCC.

Prior to CHAMP, the manufacturing technology program had limited resources (some electronic systems but almost no equipment). Instruction was difficult as there was no way to provide hands-on training to the students without the necessary equipment. Learning a manufacturing trade requires consistent, direct, shop-based interaction with modern technologies. The manufacturing industry is driven by programmable logic controllers (PLCs) and Aims continues to expand its offering in this technology. According to staff at Aims, employers are particularly drawn to Aims's Lean Manufacturing and Leadership in Energy and Environmental Design (LEED)-related courses for expanding the training of their incumbent workers.

High-tech job growth has outpaced the rest of the private sector since 2009, accounting for one out of every six private-sector jobs. This trend is expected to continue for the next decades as the demand for jobs in this growth industry heightens. There are 120,000 manufacturing jobs currently available in Colorado alone. According to the Bureau of Labor Statistics for the year 2012, jobs in electrical and electronics repairers as well as employees in commercial and industrial equipment sectors earned a median annual income of $52,940 nationally and $55,500 in the state of Colorado.

Engineering Technology. Engineering graphics is a perennially in-demand profession because virtually anything that is constructed, manufactured or built is drafted with CAD software first. The engineering technology program at Aims offers eight certificates that can be obtained independently or stacked into the AAS in CAD. This program is designed to provide students with an understanding of applied mathematics and physics and the knowledge and technological skills to solve typical engineering-related problems. As with all career and technical education (CTE) programs at Aims, students can earn an AAS degree in two years or choose to obtain stackable certificates in two semesters.

CAD and geographic information systems (GIS) are becoming invaluable tools in the engineering community. The purchase of the latest 3D printers and software turned the program around: now, students train for their professional futures on the latest in cutting edge industrial machinery. New software for CAD and GIS, purchased under CHAMP, provides engineering students with training on industry quality programs. Additionally, building ties with the surrounding industry allows Aims faculty and students to be current on latest industrial advances and hiring practices.

CAD engineers produce technical drawings for innumerable industries such as architecture, construction, manufacturing, electrical / electronic, piping, mechanical electrical plumbing (MEP), graphic illustration, etc. In 2013, in the field of architecture, for instance, CAD engineers earned median annual incomes of $75,320 nationally and $85,170 in the state of Colorado.

Building/Construction Site Management. The building/construction site management program at Aims offers four stackable certificates within the construction management AAS, preparing

students to enter jobs in project management, general constructing, on-site superintending, estimating, materials testing, real estate development, technical sales, financing, scheduling, etc. Aims also offers a combined certificate through the construction management program for green/sustainable building – one of the fastest growing subfields in construction. Industry partnerships played a key role in the rebooting of the construction program: advisory committee members were instrumental in providing advice and insight that guided equipment purchases and course curricula changes.

Professionals holding building/construction site management degrees oversee all types of construction projects: industrial, commercial or residential. In 2014, the position of construction manager brought a median annual income of $82,790 (or $39.80 hourly) nationally and $91,960 in the state of Colorado.

IMPLEMENTATION

Process of design / redesign

As mentioned above, one of the main objectives under the grant was to create new and transition existing courses to online and hybrid formats. Online and hybrid courses allow students the flexibility to work on their degrees from remote locations and around their busy schedules. They can bring relief for students with limited mobility or families to take care of and, especially, for students of all ages who are committed to rigid work schedules. Online and hybrid classes also alleviate the problem of limited laboratory space at Aims. As the industrial technologies instructor pointed out, the programs – CAD, constructional management, oil and gas and industrial technology – all vie for the same limited lab space and equipment. Thus, the implementation of online learning helps avoid space/scheduling conflicts.

The instructional designer brought on for the CHAMP initiative, organized all faculty members to submit their redesigned or newly developed course materials to her. She would, then, determine which materials are original works and appropriate them into the OER platform. The total came to 59 courses to redevelop for all of the disciplines. All courses had been completed at the time of the site visit; however, the instructional designer was additionally tasked with making sure all the redesigned courses were Americans with Disabilities Act-compliant; this was still in process.

Aims had some internal challenges in this transition to OER. One challenge noted by the instructional designer was getting faculty to submit their course materials to be re-scripted into online format. This was particularly difficult when it came to asking faculty to provide content they created themselves. Some education on the grant and OER was required. Another challenge noted by the instructional designer was that some of the AET courses do not lend themselves to strictly digital / online format and need to be "hybrid" – courses divided between online and in-person curricula – because they necessitate physical presence and hands-on practice. An example the instructional designer provided was the CAD program. Construction

management, on the other hand, has transitioned all but a couple of their courses into online or hybrid format. While this transition to online coursework has been useful in many ways, the project lead also noted that, while online learning can offer much-needed flexibility to many students, not all students "take to" the online format, particularly the "traditional" students who do not necessarily have the discipline to learn on their own and need the structure of the classroom.

Under CHAMP, colleges have intentionally created more stackable certificates to accommodate the most popular and fastest growing industrial job sectors in the region. So far, the AET department has four new certificates pending launch: 3D printing, automation, lean manufacturing/quality and supervision. These and other AET department certificates can each be obtained in two semesters or stacked towards an AAS degree. Of note, the dean of Aims expressed the concern that this model may not necessarily advance the students' chances of employment since the manufacturing industries do not actually require certification. As such Aims may need to work to advertise these credentials and their value to local industry.

The "transferability" of common skills is another concern factored into the redesigning of courses: it entails making sure that the knowledge and equipment training can be applied outside of the narrow scope of one particular trade. For example, in the event that the oil and gas job market wanes, the skills of working with pumps, valves, hydraulics and pneumatics can be professionally exploited in any number of other sectors. Faculty and staff agreed that attention they should incorporate "soft skills", such as communication, ethics and leadership, into all four programs to boost the graduates' "employability". The webpage for each program provides an attachment with an "essential skills" guide that lists the physical, cognitive, communicational and behavioral practices required to succeed in each area of interest.

As evidenced throughout this report, the acquisition of new machinery and software made a very big difference for the AET programs at Aims, and many courses were positively impacted by its presence. The construction management program had the most curriculum changes of the three. The department chair has been actively involved from the very beginning of the grant and saw the potential for growth and opportunity. The engineering technologies aspect of the CAD program has capitalized on its 3D printer and virtual modeling software; this program acquired the newest equipment under the grant. Overall, each program has taken advantage of the equipment but, in project lead's estimation, more training for the faculty is needed: the curriculum redesign cannot take full effect until the instructors are able to utilize the equipment to its full potential.

Equipment purchases

In the first year of the grant, Aims experienced major delays with proposed renovation approval and ended up foregoing renovation altogether and redirecting grant funds towards additional equipment purchases. Indeed, the purchases of major, state-of-the-art equipment have been key in improving the program, igniting student interest and catching the attention of

manufacturing businesses to see Aims as a serious institution, capable of producing high-caliber employees trained on latest technologies. According to Aims faculty and staff, this tactic has been successful: representatives from businesses such as the Woodward Governor Company were so impressed with the mechatronics system they sent their people to train on it.

In choosing what to buy, the staff at Aims considered industry needs as the guiding principle. The project lead stated:

> Our focus is based off of what we saw coming in industry. Additive manufacturing and automation [are] two really bright areas of the manufacturing market right now. And since we did have some business partners with our advisory committees, we were able to talk with them and say, give us some ideas here of what you think is going to be needed down the road. And the most common things we heard were electrical-mechanical or mechatronics. And that's what we chose to focus on.

As the result, the department purchased over a dozen new 3D printers, a mechatronics system, PLC trainers and a laser cutter – the tools they see as fitting best with the direction of current manufacturing demands. The CAD instructor mentioned that the program is considering getting new Hypermill software that will allow for virtual 5-axis machining.

Aims hired two laboratory technicians to take care of the equipment and to be the on-site help to students: one handles the 3D printers and CAD; the other oversees mechatronics and the six-axis robotic arm. Other 3D printing projects carried out by students included printing and assembling a drone, with another drone in the works that would allow for GIS mapping capabilities. One of the exciting properties of 3D printers is that they contribute to their own sustainability: they are capable of printing their own replacement parts, when things break down.

The two student lab technicians have also been instrumental in spreading the word about the programs and equipment capabilities to the public. One of the lab technicians had signed up to teach summer courses at FRCC – a member of the consortium – using the knowledge gained working with the equipment at the Aims laboratory. He will also be teaching several courses at Aims during the spring semester.

The equipment that elicited, by far, the most excitement among the interviewed staff, administrators, faculty and students are the 3D printers. Everyone interviewed expressed pride when speaking about the array of 3D printing options and opportunities for trade specialization: they see these machines as the industrial standard for the next several decades and appreciate the opportunity to be able to train and experiment with the latest in hardware and software.

Students served/student perception of program

One of the lab technicians is an Aims student who was originally taking CAD courses to help improve skills for his job at the time and ended up, in his words, "addicted" to Aims. He spoke enthusiastically about working with 3D equipment and teaching it to other students because he sees it as the top emerging technology of the future: "Being here is more exciting knowing that we are part of that expansion of new tech."

The other student lab technician was drawn to the Aims CAD program after he earned his degree from FRCC and discovered that he lacked the qualifications necessary to be hired in the clean energy industry. He describes his experience training on Aims equipment as "great":

"It expanded my view of the possible… the ability [for an idea] to grow from the concept on the screen to a 3D prototype… [and that] plastics used in our printing, I know from my experience, can be burned out in cast and bronze, steel which, I guess, opens my view into manufacturing."

The student added that he is also grateful to Aims for hiring him as a lab technician, allowing him to sharpen and share his professional skills with Aims students, which he finds rewarding.

Other Aims students echoed the excitement and gratitude for the opportunity to work on modern, sophisticated equipment. Collectively, students felt that the recent additions to the equipment and modeling software provided a golden combination of practical experience coupled with theoretical, conceptual grasp of the subject matter.

Based on student interviews, it appears that hybrid courses may be preferred to the strictly "online" format because they allow for hands-on learning experience and prevent / reduce intimidation and confusion students may feel towards the technology or the technical subject matter. With equipment-heavy curricula, students need direct practice and face-to-face instruction and demonstration. One student took an online course and did not like it as much as others "because there were no labs and there were no TAs to come in to ask questions." Hybrid courses combine the time / space flexibility of online courses with the individual, hands-on instruction of in-classroom learning – a balance students respond to well.

Faculty/staff perception of programs

Like students, the faculty are very impressed with the technological make-over afforded by the CHAMP grant. The professor of CAD, for instance, was thrilled with CHAMP involvement and suggested that having 3D printers and the relevant modeling software helped students grasp conceptual design behind the mechanics and provided an opportunity for hands-on practice and innovation:

"The 3D printer [has] given me the capabilities to show them [students] how to design something on the computer, turn around, print one piece of it, and then try and print other

pieces, and then put it together in an assembly. So we get the details and assemblies, which is a really big deal in manufacturing. And thanks to CHAMP, we've got a laser… this money has really been well spent."

EMPLOYER COLLABORATION

Previous employer relationships / how they changed

In line with the primary CHAMP goal to strengthen relationships with the manufacturing industries, Aims is working very hard to set up internships and apprenticeships with businesses. Several internships have been established since the navigator (see below for more on this position and changes to it) came on board, though, she is careful in setting the terms of internships so that they provide students with optimal learning experience. Due to the nature of corporate goals, companies are interested in students as workers, first and foremost. Some care less about the educational process of the internship and more about employee performance and timing, which conflict with the academic goals of college internships.

Likewise, when it comes to incumbent workers returning to college to sharpen or update their skills, the employers are not necessarily interested in extending them the time it takes to do so within the parameters of the academic schedules: they want training to be as fast as possible. As the industrial technologies instructor put it, "[the] difficulty there is that employers are not interested in giving credits and waiting four months for their employee to get the skills they need. They need three days, eight hours each day and done." Aims is considering compressing the coursework for the incumbent workers into schedules that closer resemble the typical seven-day work-week rather than college classes stretched out over the course of the semester.

Feedback on course changes, equipment purposes, etc.

Existing advisory committees have reexamined through the grant to make sure they are getting industry leaders involved in all aspects of the manufacturing programs. Initially, the navigator brought in several company representatives but few have stayed actively involved past the initial meeting. College representatives hope this will improve as the programs become solidified and businesses begin to perceive a foreseeable pay-off in the form of many excellent graduates. There has also been some cross-pollination on individual level. One of the lab technicians, for instance, mentioned that he visited a local company that does laser cutting for advice on new equipment, and they offered to come to Aims's lab and help him set up/figure out anything he needed, pertaining to laser cutting. Aims staff plan to further develop these relationships throughout the remainder of the grant.

Future plans for these / other employer partnerships

Aims is currently in the process of splitting the navigator position into two separate jobs and hiring two individuals to take over. This way, one outreach person can dedicate full-time efforts

to bringing visibility to Aims's manufacturing programs with businesses and building those industry partnerships.

The project lead believes that the outreach and the bridging of the gap between Aims students and the industry employers requires a commitment not only from the administration and the appointed navigator, but also the faculty. He offered the admirable example of one CAD instructor who joined the Aims-organized tours to the companies and asked with industry leaders what he should be teaching the students in order to make them more marketable, desirable future employees and ended up drawing many more students to the CAD program through his enthusiasm. The project lead suggested that this kind of involvement from the faculty is needed for the other two Aims programs under CHAMP.

The project lead sees the fostering of the Aims-employer relationship as a process of cultivating ties, networks, advisory committees, mutually-beneficial programs and collaborations – with long-term goals in sight: "[W]e have to build relationships with companies. We have to build the name of Aims … And it will come back to us eventually. Maybe not overnight. Maybe not instantaneously. And maybe not during the life of the grant, but we are building that reputation."

Aims's website provides details of the CHAMP initiative and asks interested northern Colorado manufacturing businesses to get involved:

Through credit redesign and the addition of industry-driven content, CHAMP partners will help increase the attainment of manufacturing degrees and certificates that align with the industry's recognized competencies, skills and certifications which will create a pipeline of highly-qualified manufacturing industry workers.

NAVIGATOR

Background/role at college

The CHAMP navigator position was not filled at the time of our visit. The navigator had recently taken another position in the college. However she worked for the grant for a little over a year and thus this section will focus on her efforts. She holds a master's degree in Latin American Studies and Law from the University of New Mexico where she was once employed in business operations. She also has a background in industrial health and safety. She joined Aims in July 2014. During her time as navigator she served in two capacities: as a student mentor and as an employer outreach / internship coordinator. As a mentor, she participated in student recruiting, helped existing students make sense of the programs, courses and career paths available to them, tracked their progress and co-supervised a student club (the overseeing of the student club has since been passed on to a different staff member).

However, due to low enrollment numbers, there were very few students needed advising and, as a result, she focused most of her efforts on the industry marketing and outreach goals. The AET department head, from the start of the grant, identified the lack of outreach as one of its main weaknesses, and the navigator set industry networking and community involvement as the top priority.

Work to date

As stated above, the navigator's main focus had been to reach out and build relationships with businesses serving the North Range region: making them aware of the programs Aims has to offer, setting up internships/apprenticeships, soliciting employer participation and mentorship, etc. She was actively involved in the Northern Colorado Manufacturing Partnership – a regional sector alliance that works with other consortium members – and capitalized on her many relationships with Weld County Employment Services people by recruiting them into Aims advisory committees.

Becoming a member of the Manufacturing Partnership's Rocks Committee which organizes industry tours was another strategic effort by the navigator to up the visibility of Aims's programs to regional businesses. Bringing high school students to visit manufacturing facilities serves two purposes: exposing students to the industry and the opportunity to join it through Aims programs and alerting the industry to the incoming workforce:

[T]he idea is that educators and manufacturers come together and they coordinate this learning experience for students. To raise awareness about manufacturing, to open the eyes of counselors and teachers that manufacturing is not this dirty, dated, dangerous occupation that it used to be. And the idea is that that would not only help sustain educational programs like the ones that I helped monitor here, but also increase the employee base for these manufacturing companies in the area by giving them well-trained passionate employees that understand what manufacturing entails.

Aims students also toured industry facilities but on a more individual basis: accompanied by the navigator. For example, the navigator and two full-time faculty took 30 students to tour Harsh International, a manufacturer of agricultural/environmental equipment: the tour was a great success, and the relationship was, in part, strengthened by the fact that a Harsh employee (Aims alumna) is currently serving on the CAD program's advisory committee.

The navigator extended much effort towards establishing internships and making sure that the terms of those internships provide maximum training and academic benefit to the students and not just the companies. One of the challenges with businesses is that they are frequently interested in "project-based" internships intended to staff rush-season, project-specific tasks, whereas the navigator believes that internships should be not only be project based or seasonal, but have extended opportunities for the students to benefit in the long-term. Likewise, small "mom and pop" companies are often simply looking for "bodies" which also does not serve the

navigator's idea of a good internship. Vetting companies for questionable practices and ensuring a good fit for Aims students was a big component of the navigator's sense of responsibility towards the students.

On the student recruitment end, the navigator, made herself available to interested students helping them understand the admissions process, speaking with parents, forwarding relevant informational materials, etc. She created and electronically disseminated several templates with descriptions of programs of interest. Those materials outline the specific pathways of certification and degree requirements towards various academic/employment goals students may have. Before, when students expressed interest in a program, they would be directed towards the general departmental website, but now, they receive personalized emails with all the necessary information provided in one document.

The navigator reported that she made the Interactive Career Map – a career trajectory outlining tool developed under CHAMP by the Council for Adult and Experiential Learning (CAEL) – available to both students and faculty. She noted that the online tool serves better as an in-office advising aid, rather than an independent research resource: the students prefer to come into her office and have her walk them through it rather than explore the tool on their own. In general, while some students have no problem actively locating help and resources for getting through the program, others could benefit much more from additional navigator attention to better articulate their professional aspirations, develop an understanding of what it takes to enter and complete the manufacturing programs and form professional future-building strategies.

The navigator also maintained lists of students that have expressed interest in Aims's programs – something that did not exist prior to her involvement. She also completely revamped the departmental website as well as created several social media accounts to establish a stronger online presence and wider audience reach. The program website, which had not been updated for several years, now offers photos of the exciting new equipment as well as a "Featured Alumni" page, showcasing the professional successes of Aims's AET department graduates. As the result of this alumni initiative, three out of the four currently featured companies want to host interns from Aims. The website also boasts a "Student Spotlight" section as well as a "Business and Community Partners" feature, which the navigator created with the intent to show appreciation to the 20+ industry leaders involved with Aims, advertising their company logos with links to their respective websites.

Other student marketing efforts put forth by the navigator include starting a newsletter, "Cogwheel Quarterly," to bring program updates to the public's attention and printing up various promotional merchandise and informational pamphlets in order to represent the department at external and internal fairs and networking events.

Workforce center collaboration

The navigator was also actively involved with the Weld County Workforce Center, attending all their training events, inviting them to join the advisory committees and making them formal members with voting privileges and opportunities for involvement in the programs. On their part, the workforce center recruited the navigator into their "leadership committee" as part of an effort to strengthen and streamline certain processes between the institutions.

The navigator is aware of the necessity to track referrals between the workforce center and the CHAMP program but reports that the Weld County Workforce Center lacks updates to current software to maintain records of student referrals. For this reason, other than informally asking the students about how they found out about the program, she has no official means of knowing how many of them came from the workforce center. Fixing this data tracking discrepancy is definitely on the agenda of things the navigator hopes will be fixed in the coming years.

Future plans

As stated earlier, to date the navigator position included two separate components: student mentorship and business outreach. The person hired for the position had served both necessities but focused much more on marketing and industry outreach. In the first year of the grant, there was less need for a student focused navigator as there were very few students, but as enrollment grows, there is more demand for student advising. In the coming year and with the need to hire a new navigator, Aims will split the position into two separate jobs. Aims will hire two individuals so that each one will be more effective by focusing solely on one objective. The new navigator will be involved in the student club, work on building trusting relationships with Aims students, tracking their progress, helping them build resumes, apply for internships, etc. The outreach person will handle all marketing and networking: this position is centered on building visibility and relationships with industry leaders as well as recruiting students into the programs. One dean sees the hire of the navigator and the outreach specialist as part of the long-term plan for student enrollment sustainability.

The most recent navigator expects that, in time, as more students graduate Aims manufacturing programs and join the industry, the department's relationship with local industries will be further strengthened as the alumni will serve as mentors and business contacts for future Aims grads.

PRIOR LEARNING ASSESSMENT/CREDIT FOR PRIOR LEARNING

The dean of Aims mentioned that the topic of PLA/CPL is actively discussed in the context of workforce development, that there have been "some problems on the academic side" and that he envisions a synergy with businesses, though he is not certain where on campus this will take

place. Two people have been assigned to oversee CPL: the registrar and another individual recruited from the aviation program. Both are very active on the board.

CONCLUSION

Challenges to date

Both, the navigator and the project lead expressed concern about the quantities as well as the quality of preparedness of Aims graduates, in pipelining them into the professional sectors they wish to enter. The navigator mentioned that not all students placed in internships perform to the expected standards. The project lead suggested that, due to low enrollment, he is hesitant to approach companies with a Memorandum of Understanding (MOU) as he knows that Aims cannot deliver those graduates to the employers quite yet. An MOU would secure students graduating from the CTE programs a guaranteed interview with the employer: this is another partnership element the department chair hopes to add to the college's relationship with surrounding industries.

Soliciting cooperation between staff, administration and faculty can be a logistical challenge. It can be difficult to get everyone involved "on the same page" and working towards the same goal. Job assignments, expertise and authority must be recognized and communication between separate factions improved. The project lead hopes to boost the department's shared understanding of the value of the program's outreach.

Staff and faculty interviewed agreed that the marketing of the programs and the new equipment – "getting the word out" to students, parents, industry leaders and the local community at large – had been challenging thus far and must become the utmost priority in the coming years of the grant.

Successes / achievements to date

The purchasing of new, cutting-edge equipment has been a tremendous success in boosting the functionality of the manufacturing programs as well as getting students excited about learning new skills and joining the subsequent industries. The 3D printers in particular, have been a major draw: the students experiment and innovate on them, and the industry leaders are impressed and reassured to know that Aims students are learning the trade on state-of-the-art, sophisticated technology.

The navigator made significant strides in making the information about AET programs more available and accessible to potential and current students through the proliferation of marketing materials and online resources. She is particularly proud of the "Featured Alumni" page for its potential to provide a tangible example of professional success in the manufacturing industries, especially for traditionally marginalized groups like women. Furthermore, she established and maintained strong professional relationships with regional manufacturing industries which is a

big part of the long-term plan of establishing Aims as a major contender in pipelining highly skilled, sought-out graduates into the manufacturing workforce.

Next steps

Sustainability in student enrollment into in-classroom, online and hybrid courses is a key goal in near future development. As such, the project lead sees year three of the grant dedicated to student focus: identifying and tracking potential students, enrolling them into programs, making sure they finish their coursework and complete their degrees. He said,

> The third year is going to be concentrating on students. We've bought the equipment and laid a good foundation for partnerships, so now, we want to concentrate on students. Our partnerships will evolve, as we take the next step in building formal MOUs with them and I think this will all come in due time.

Training faculty on equipment is an immediate necessity as well. The equipment is yet to be operated to its maximum capability, which, in turn, shortchanges the students of the invaluable knowledge and skills required to be competitive in the manufacturing workforce. Professional development has been boosted by sending faculty and staff to various conferences and training workshops for software, and equipment (CAD, GIS, Amtrol, Fortus 3D printer, etc.) but much more needs to be done on this front.

The consensus shared by the interviewed staff, faculty and administrators is that now that the initial logistics and infrastructural issues are being settled and the department is operating at a high standard, most effort should be channeled towards aggressive marketing of the programs and their "product" to the business community – in order to bring more students to the classrooms, attract more interest from the industry and make Aims stand out from others in the Front Range region.