Colorado Helps Advanced Manufacturing Program

Employer-College Relationships

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Education and Employment
Research Center

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INTRODUCTION

Colorado Helps Advanced Manufacturing Program (CHAMP) was a Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant awarded by the U.S. Department of Labor. CHAMP, which ran from 2013-2017 involved a consortium of seven Colorado community colleges, a technical college, and a four-year university.[1] The Colorado Community College System (CCCS) provided technical assistance and management support for the consortium.

The primary objectives of the CHAMP project were to realign Colorado's higher education manufacturing certificate and degree programs with industry's current and anticipated needs and to increase the attainment of degrees and certifications in manufacturing. To achieve these objectives, the CHAMP project engaged in the following:

- Creating employer-driven curriculum by building on Colorado's existing and emerging manufacturing sector partnerships and their work on career pathways;
- Increasing the use of technology to accelerate training and reach a broader audience, including the redesign of existing certificate and degree programs, and the establishment of new online and hybrid courses;
- Redesigning the current CCCS model for credit for prior learning to accelerate certification;
- Developing stackable and latticed certificates; and
- Purchasing new, state-of-the-art equipment and software.

Research suggests that strong relationships between community colleges and local business partners are key to building robust workforce development programs for students (Mann, 2017; Jenkins & Spence, 2006).

Slow economic recovery, rapid transformations in technology, higher-skill and credential requirements for good-paying jobs, and emerging mismatches between employer needs and worker skills make business and educational partnerships critical. (Wilson, 2015, p. 2)

Close collaboration between industry and higher education, however, is not new. The literature is filled with research extoling the importance of having employers and educators work together to train future generations of Americans (Spaulding & Martin-Caughey, 2015). Increased employer engagement - to ensure that students are graduating with skills that meet employer demands - has also been a key element of all rounds of TAACCCT grants (Mikelson, Eyster, Durham & Cohen, 2017).

Employer's involvement with postsecondary education can be thought of as:

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[1] The consortium included Front Range Community College (FRCC), Aims Community College, Community College of Denver (CCD), Emily Griffith Technical College (EGTC), Lamar Community College (LCC), Pikes Peak Community College (PPCC), Pueblo Community College (PCC) and Red Rocks Community College/Warren Technical College (RRCC), and MSU Denver (MSU).

A continuum of involvement that ranges from serving on advisory boards for technical degree programs to actively participating in the development of curriculum and training. (U.S. Department of Education, 2012, p. 3).

At the lower level of the continuum, employers join college advisory boards to review curriculum and offer general advice on workforce issues and labor market needs. Further along the continuum, employers and educators form partnerships to design training for immediate workforce needs and/or contribute to industry-led efforts to prepare students for jobs. They may also donate equipment, provide internships, and serve as adjunct faculty to teach a specific subject area. At the higher end of the continuum, employers and colleges work closely together to analyze workforce needs and develop curriculum and training that will meet those needs (U.S. Department of Education, 2012, p.4). Employer involvement in CHAMP represents the low and middle parts of the continuum, but for some of the CHAMP colleges, the grant allowed them to begin to move towards that higher level of the continuum as will be discussed below.

Over the course of the CHAMP grant (2013-2017), local employers were critical partners, and these partnerships were central to the grant's successes. The collaborations included: establishing advisory boards to review curriculum; integrating industry standards and knowledge into course curriculum; fostering the development of internship opportunities; posting information about current and anticipated job openings; and helping colleges identify state-of-the-art equipment and software to purchase for programs.

While college-industry partnerships are not a new phenomenon, the ways in which they work together are varied. This brief provides perspective from both local employers and community college staff about the implementation of the CHAMP grant, the relationship between the partners, and the legacy that was created. The brief was prepared by Rutgers University's Education and Employment Research Center (EERC), the third-party evaluator for the CHAMP project.

Part I describes methodology and data sources. Part II focuses on ways in which employers interacted with the colleges and ways in which they influenced CHAMP. Finally, Part III discusses best practices to continue college/employer relationships as the CHAMP grant concludes.

PART I: METHODOLOGY

EERC used qualitative methods to explore the ways in which employers interacted with the colleges. EERC team members engaged in phone and in-person interviews with 19 employers[2]

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[2] While ERCC reached out to employers across the consortium, most of the interviewees had worked with Front Range Community College (FRCC) and Pueblo Community College (PCC). Those that agreed to participate in the research also tended to have more positive views of the program. EERC thus recognizes selection bias.

as well as with faculty and staff at consortium colleges, and senior staff at the Colorado Community College System (CCCS) office.

Most interviews were taped and transcribed; non-taped interviews involved extensive note taking. These transcriptions and notes were coded using NVivo qualitative data management software and analyzed by EERC team members.

PART II: HOW EMPLOYERS WORKED WITH THE COLLEGES

For over a decade, Colorado has been involved with sector partnerships that foster industry-driven alignment across economic development, workforce development and education. Targeting key industries, Colorado's Workforce Investment Board (CWIB) and Colorado's Workforce Development Council (WDC) have invested in a number of initiatives that involved regional, public-private partnerships to support the expansion of a region's economic vitality – including the development of programs to train and retrain individuals to meet changing industry needs.[3] As such, the eight regional manufacturing sector partnerships which predated CHAMP, not only laid the "foundation for industry engagement for the CHAMP proposal" (CCCS, 2011, p6), but also provided critical insights to the CHAMP program.

Under CHAMP, CCCS required each of the colleges interested in joining the consortium to demonstrate that they had well–established relationships with industry partners. For many, these relationships grew out of the federal mandate for industry to be involved in the development and revision of Career and Technical Education programs.[4] In some cases, curriculum committees had been formed, and other times more formalized business or industry advisory boards had been established to build community colleges' technical capacities. These advisory boards often reviewed new programs as part of the college's accreditation requirements (Spaulding & Martin-Caughey, 2015, Rose & Stiefer 2013).

In addition, prior to CHAMP, all of Colorado's community colleges participated in one or more federal grant programs including the first and second rounds of TAACCCT grants – Colorado Online Energy Training Consortium (COETC) and the Consortium for Healthcare Education Online (CHEO). Under these programs, the colleges had established or expanded their engagement with industry using their industry advisory boards. It was through these advisory boards that most employer-college partnerships occurred.

Advisory Boards

Some key ways community colleges have traditionally targeted employer input are with curriculum committees or advisory boards that approve new programs as part of accreditation

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[3] See https://www.colorado.gov/pacific/cwdc/sector-partnerships
[4] Pursuant to federal Perkins' regulations all CTE programs are required to hold regularly scheduled advisory board/committee meetings. Colorado Community College System (2008). A guide to the operation of career and technical education advisory committees. Denver, Colorado: Author. p ii

requirements (Spaulding & Martin-Caughey, 2015, Rose and Stiefer 2013). Business advisory boards have also been a tactic to engage employers in federal grant programs aimed at building the capacity of community colleges (Spaulding & Martin-Caughey, 2015, Eyster et al. 2010). The CHAMP proposal indicated that each college either recommit to an existing industry advisory board established for its CTE programs, or establish a new one to focus specifically on the needs of advanced manufacturing. Through the advisory boards, colleges were to "solicit ongoing feedback about how well its courses met industry needs" and to use industry input to modify courses and/or create new ones so that CHAMP-related courses included "the content necessary for students to gain stackable, industry-recognized credentials" (CCCS, 2011, p20). Advisory boards were to provide on-going review of curriculum and credentials that were needed in the field. In addition, college staff members were to use the expertise of advisory board members to make decisions on equipment purchases and software updates for CHAMP programs.

While the CHAMP proposal stipulated that college advisory boards had to meet at least once a year, colleges were given the latitude by CCCS to choose the size of their board, the range of board functions, and the frequency of meetings. They were also able to choose whether they wanted to have a single advisory board or multiple boards each focused on a different manufacturing program at their respective college, e.g., welding, machining, engineering graphics.

During EERC's interviews, employers generally described a positive advisory board experience. An employer working with the Industrial Advisory Board (IAB) at MSU Denver – a committee comprised of local industry leaders who extended their considerable professional experience towards helping with decisions about new curriculum development and equipment purchase choices –spoke highly of the experience:

> *Metro State is very good at working with industry. So, they were good listeners…This is all through the advisory board.*

Some colleges had multiple boards. Aims, for instance, had the challenge of maintaining its four different advisory boards each focused on a separate program area – engineering technology, manufacturing (industrial) technology, building/construction site management, and oil and gas technologies. Not all of these boards are CHAMP related, but they are all run by faculty and staff involved in the CHAMP programs.

> *We have four advisory committees, which is unwieldy to say the least. I get the need we've got four programs so it follows we should have four committees…Because for me as department chair the most difficult area I have to deal with are the committees. It's lining up the committee members. It's running the meetings. It doesn't sound like a whole lot, but oh my gosh, it is such a chore. And then maintaining them. And that's where I've really done a poor job. I'll be the first to say that I don't have the resources and the time on my own to be able to maintain all four committees in between meetings. And to me that's the key that we're missing.*

While it was at the college's discretion whether to combine or keep boards separate, it is clear managing multiple groups of employers and faculty can be burdensome.

FRCC faced the additional challenge of creating a brand new employer board, because the program was newly created under CHAMP.[5] To facilitate the process of forming the advisory board, FRCC hired an employer outreach coordinator in addition to the grant required navigator position. The person in this new position focused on building and managing relationships with local industry leaders; gathering feedback from employers for the program; recruiting incumbent workers to training; and securing internships, apprenticeships, and employment opportunities for FRCC's machining students. One employer working with FRCC recalled how the early advisory board meetings helped employers gain confidence in the college:

> *The Dean of the school, and then the President would show up [at advisory board meetings] every once in a while, and the Head of Curriculum would show up and just they were very committed and bright people. I was actually kind of amazed. I guess I previously had an image of community college of kind of being a little bit of like the second team. But these guys were – they were all first teamers. I was very impressed.*

Employers, however, were not without their critiques of the advisory boards. The time commitment was a frequent concern discussed in interviews. One employer explained, "Personally, the challenges for me was to find the time to attend the meetings." Like some employers, project staff also expressed concerns about advisory board attendance – as well as engaging employers between the bi-annual meetings. The challenge was described by Aims' CHAMP navigator, "from February until October is a very long time." Similarly, an administer from Aims commented,

> *They [employers] forget about us a little. And I get that, but in order to get those partnerships really strong, we need to stay at the front of their mind.*

At the start of the CHAMP project, some college faculty who worked with their respective advisory board were hesitant about placing too much emphasis on the input provided by the advisory board. For example, an instructor at FRCC recalled,

> *It was certainly really challenging in the beginning. But, once I understood that this is really our requirement in order for us to have this great facility I was able to change my thinking 180 degrees.*

While faculty often did not have a formal role on advisory boards, many looked to them to guide curriculum development – wanting to ensure that new curriculum was responsive to industry needs.

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[5] At the start of CHAMP, FRCC reinstated their machining program in response to the industry demands.

> *We don't make a change without consulting them [the advisory board] because we want their buy-in. They're the ones hiring our students.*

High CHAMP project staff turnover (e.g., PPCC and CCD) was also an issue for employers. Employers partnering with these colleges complained about such disruptions. For example,

> *One of the challenges is they – the person that was in charge of the CHAMP grant - changed three times. So that was a challenge. So, there wasn't as much continuity as there could have been just because each time a person changed, they had to come up to speed. And that's not that the individual left or was fired. They were repositioned to do something else within the college. So that was a little frustrating. That was probably the biggest challenge, I would think.*

Overall, however, employers perceived the advisory boards positively. For many new to working with higher education institutions, the meetings helped them to understand the scope of the CHAMP initiative and the capacities of the colleges.

Curriculum Development

One of the major objectives of the CHAMP project was to enhance the alignment of program curriculum with industry needs. This alignment included updating course materials to include new industry processes and technologies; and modules that addressed use of new state of the art equipment. There was also attention to aligning course assessments with industry standards, e.g., NIMS certification. In addition, some colleges transformed some curriculum into online and hybrid modules. Lastly, there was attention to the establishment of new short and long-term certificates that could be stacked, and/or creating new career pathways, addressing both industry needs as well as those of new and incumbent workers.

Members of industry advisory boards worked with college faculty as co-designers—collaborating on new curricula and pathways (Wilson, 2015). In the process, employers new to curriculum development observed the challenges of their work. As one employer observed,

> *It is sometimes difficult to know what the best thing to do is with curriculum. It's a lot like a puzzle. You got X number of credits – 43 credits, for instance. We got to fill 43 credits, and what do you want to do? Well, you want them to know this. We want them to know this, this, this and this. And then, they start doing the math and we're up to 90 credits, and well, we got to trim something, so what do we cut out? So, it's a little difficult to help with that. I know it's not on my shoulders completely, but I still feel responsibility for that and try to do the best we can, but it's not that easy.*

The remainder of this section describes how employers successfully worked with the colleges to emphasize soft skills in the curriculum and help with equipment purchases.

Soft Skills

Employers across the country have increasingly indicated the need for individuals to enter the workforce with better *soft skills* - work-related skills that facilitate communication, problem solving, flexibility, responsibility, leadership, and teamwork. In fact, some employers have stated that soft skills are at times more important than hard skills (Davidson, 2016) in securing employment, keeping a job and getting promoted (Robles, 2012). The development of soft skills has therefore become a focus of CTE programs as well as of post-employment trainings (Mitchell, Skinner, & White, 2010; Bronson, 2007; Houghton & Proscio, 2001).

During CHAMP, most employers sitting on advisory boards felt that it was important to include soft skills in CHAMP curriculum. A small minority, however, felt that,

> *…. if they don't know that by now, you can't teach it. We don't want you spending your time teaching that…*

The majority prevailed, even if there were some differences as to what aspects of soft skills should be taught, and when and how they should be integrated into the curriculum. Employers working with FRCC's CHAMP program were leaders in pushing for the establishment of a *professionalism curriculum*.[6] These employers believed such a curriculum could boost motivation, and enhance, if not instill, in students a work ethic, and the discipline needed to be successful in their chosen careers. Initially, however, some FRCC faculty were not on board, concerned that such content would take time away from other course material. One employer on FRCC's advisory committee captures the process or evolution of soft skills in the CHAMP curriculum:

> *…Actually, the first time I brought it (soft skills) up I was pretty well shot down. And then, within a year, it seemed like everybody was on board. And then, it became 100 percent, do it. And actually, Front Range weren't (sic) overly enamored by the idea themselves when the manufacturers came in. But, they did it and came back later with the instructors and said 'we didn't want to do it. We didn't want to give up machine time, but it was a good choice and we're seeing improvements with students coming to class on time.' They like the professional environment of everyone wearing the outfits, the shirts, the Front Range shirt. So, I think it's a good example of that where we ended up working and collaborating togethe*r.

Other FRCC advisory members confirmed the above change in perceptions, as did interviewed faculty, one of whom recalled how an advisory board member pitched the idea to staff:
> *[He said], 'You guys can teach them technical content, but we need them to have those soft skills. Show up on time, if you can't be at work on time, call in. Come to work dressed appropriately, those kinds of things.'*

These comments indicate how critical employers were to changing the curriculum to include soft skills at FRCC. One staff member described how faculty recognized the impact of their

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[6] Courses that are affected by the professionalism curriculum award 24 percent of the final grade on the basis of student "professionalism," with points awarded for punctuality, teamwork, communication, wearing uniforms, and so forth.

advisory board's recommendations, and how it was paying off with their students: "It puts them into a community. It builds a culture that they're going to take with them on to the job." An advisory board member at PPCC observed,

> *Well, one of the biggest recommendations, again, was that soft skill recommendation that – which they took to heart and have done a lot with. So that's really good to see.*

A department chair at PPCC echoed the importance of the soft skills curriculum:

> *We're finding that a lot of our industry partners are looking for somebody that's just not one, you know, does one thing – that can think on their feet, have those critical thinking skills, have great employability skills, such as, you know, time management and presents themselves well.*

Finding the right mode of delivery, however, was not always easy. At PPCC the college initially contracted with Goodwill Enterprises, interweaving Goodwill's soft skills modules into CHAMP courses. But students gave feedback that many of the modules were too simplistic, and did not stimulate interaction. As a result, PPCC's navigator began to go into classrooms and cover the soft skills curriculum face-to-face with the students.

The integration of soft skills and program curriculum is a rich example of the mutual benefits of partnering with the very businesses that will hire students. It also shows the value employers can introduce to help colleges move beyond more traditional curriculum.

Equipment[7]

In employer/college partnerships, it is common for colleges to engage employers to "*advise on, loan, or even donate technology to support hands-on learning*" (Wilson, 2015, p. 8). During CHAMP, this area of partnership was no exception. In general, employers provided guidance through the college's advisory boards – but a number of colleges worked more closely with local employers who advised the college over time. Such was the case at both PPCC and FRCC.

At PPCC the advice was targeted to the specific needs of the region's businesses – recognizing the capacities of these companies, and the capacity of the college. A staff member described how one employer helped CHAMP staff choose equipment to purchase:
> *…He was wise enough to recognize that we needed to train a core or critical mass for all of Colorado Springs so buy generic equipment, buy generic CNC equipment, and buy things that are readily used by all companies.*

One of FRCC's employer partners echoed the pragmatics of both affordability and training.

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[7] See also EERC's brief on Addressing Industry Needs in the CTE Classroom

We told them what we were using in our shops, what the industry's using for machines that [are] affordable. We [want students to] come out of the program with some experience on machines that folks are going to have in their business[es].

PPCC also reached out to specific employers asking for their direct input. In a number of cases, faculty and staff toured company shops to "look at their shops, see what kind of equipment they're on [employees are using] and see what kind of tools they're using, that kind of stuff." Faculty reported to EERC that these tours were very helpful providing "…good insight as to what kind of equipment we should buy."

Interviewed employers also spoke about their role in helping the colleges to identify specific vendors facilitating purchases. An employer working with PPCC commented,

I worked closely with them on that [selecting equipment], as well, and made *several recommendations and gave them different contacts for vendors that we use for equipment and things like that.*

Some companies also donated both equipment and materials to college shops. An employer working with FRCC recalled,

We'd use our contacts in the industry to help them get machinery and we donated machinery – our own machinery to get the thing going – multiple machines.

Employers also helped faculty create the conceptual and hands-on content that was needed to train students in the use and maintenance of the new equipment.

In their interviews with EERC, faculty and administrators spoke of the critical importance of their work with employers – significant partners in building the CHAMP curriculum and programs. A CAD instructor at PPCC commented,

I attend all of the advisory committee meetings…and they do help out. For instance, 'Do I need to teach this?' and they say, 'No, you don't' or 'Yes.' So they are helpful. They have driven a lot of the purchasing too. 'Do we need to have this?' 'Yes, you have to have this.'

A machining instructor at RRCC shared similar experiences, and how the partnership between employers and the college benefited both:

Industry actually picked the equipment we were choosing. We pitched ideas of what we thought would be interesting to teach at advisory meetings and then as we went through it, industry actually selected all of our equipment. We went through and said, 'What do you want to see here?' And then when we got bids in and everything else, we said, 'This is how everything played out. What do you want? What do you think is the most valuable for us to teach?' And so there's machines that maybe I thought would be more interesting that ultimately don't have as much as a

representation in the market. It was important to me to make sure that they [industry] had the buy-in and that we were picking equipment that was for them because ultimately, this is to support them.

Equipment purchases were another way industry helped the colleges revise their curriculum. Across faculty and administrator interviews, it was clear that they valued this insight and the two groups of stakeholders could work cooperatively around equipment decisions.

Internships and Apprenticeships

Workplace hands-on learning experiences - internships and apprenticeships – are another way in which students and employers can mutually benefit:

> …*Apprenticeships offer a turnkey solution to common hiring conundrums, such as how to attract and retain qualified workers who understand an employer's way of doing business; how to identify the technical and foundational skills necessary in a specific line of work; and how to streamline training to use time, money and other resources efficiently.* (National Network of Business and Industry Associations, 2014).

For students, hands-on experience provides opportunities to get practical on-the-job training, while still in school. In some instances, students may also earn money while obtaining work experience.

The intention under CHAMP was to offer students a range of workplace opportunities that would enrich their learning and better prepare them for employment. Opportunities in which students move between school and a jobsite internship were also seen as a means to enhance communication between the shop floor and the classroom – furthering partnerships between industry and colleges.

Many employers with whom EERC spoke, however, identified the logistical challenges of internship programs which prevented them from hosting internships, even when they otherwise wanted to do so. Liability and insurance (for persons and equipment) were the most widely cited reasons for not hosting an intern. An employer working with FRCC explained,

> *They've [FRCC] asked us to try to bring in some students and give them some time on the job here while they're in school and going through the education. Currently, we still can't do that because of insurances and things like that. That stuff still needs to be worked out.*

Another challenge faced by employers, especially smaller shops, was the time needed to supervise or mentor students. At the same time, one employer working with CCD reflected,

> *I think it's a time issue. In my experience, it comes down to making a commitment of time and staffing, and people that are out there doing jobs.*

An employer working with Pueblo further explained:

We were trying to figure out how us smaller manufacturers could get an apprenticeship program up and running, so they [the PCC Innovation Center] actually hosted a meeting to give us information on that kind of stuff.

Nevertheless, even with barriers, some CHAMP employer partners hosted interns – and spoke about the benefits:

This is our second semester of sponsoring a week-long internship (an exposure) to manufacturing. The candidates can't do a whole lot because they aren't certified but they can shadow and do some fun tasks and get a feel for the manufacturing environment.

And another employer reflected, "Without a doubt, the interns. I can name them by name… those people have been my success stories."

For students, internships provided an opportunity to obtain practical on-the-job training, while still in school. In a few cases, apprenticeship programs provided both job experience and money. It allowed students to showcase their skills. Subsequently a few were hired directly from their apprenticeship or internship.

However, the employment of student interns created a new challenge: attrition from programs prior to completion. Colleges expressed anxiety about employers hiring good interns regardless of their successful credential completion. In some cases, students would drop out of their program to work full-time. This affected enrollment and the rate of completion of credentials – certificate and degrees – always a significant concern for colleges.

One PPCC department chair described the conundrum colleges faced with interns getting jobs prior to credential completion:

If we can't let them complete, then our programs would never stay in business - I mean, we would be shut down because we wouldn't have completers. And it took a little while to get them [employers] – their minds adjusted to that. 'Well, we're hiring your students.' Well, yes, but they're not finishing their education.

A CCD department chair echoed this issue,

One of the problems with being able to finish students on the associate degree is that unless they had that as their focus when they came, as soon as they get some skills, somebody hires them and then they're gone.

The paradox of training for employment and losing students to employment was captured in the following comment by a CCD faculty member:

The best way for us to get those numbers up [create more internships] would be to get more of a commitment from them (employers) to actually bring folks into their operation, spend time with them. The challenge that we have is once they get them into their machine shop, for example, there is a good chance that they will be hired, and that's a challenge, students don't complete that credential. But this shouldn't keep us from doing internships, because that's good, it's a win-win for both the student and the machine shop. But it does not help our numbers much, and it doesn't help overall CHAMP numbers.

In sum, across the board, employers and colleges agreed on the importance of workplace training, and recognized this as an area for further growth. However, colleges wanted employers' assistance in promoting the value of completing certificates and degrees.

Hiring Program Graduates

In addition to providing workplace internships, employers working with CHAMP colleges act as a source of job information about industry trends as well as anticipated job openings within their own companies. When colleges worked closely with employers, students often got up-to-date, local job information, which enabled the colleges to better help students find jobs after graduation. Community college faculty and staff recognized this - having graduates get good jobs was the ultimate goal. As a CHAMP staff member stated,

Students, that are, you know, they complete the program, they're going out and getting decent jobs. And that's, for me, that's what it's all about.

The more intimate knowledge employers had about CHAMP curriculum and skill assessment the greater the chance a program's reputation will be part of the equation of recruitment and hiring. For example, one southeast Colorado employer EERC interviewed stated, when he/she is looking to fill an open position, "The first thing that I do is reach out to LCC, about the CHAMP grant." Another employer described the appeal of hiring new workers from the CHAMP colleges – as he/she has found CHAMP graduates are a better fit with changing manufacturing needs:

Manufacturing is a constant learning environment. The materials are changing, the equipment's changing, the software is changing. All these things are changing all the time. You really need somebody that has a learning orientation and likes the challenges of new things. Somebody that is showing some proficiency in school and a desire to continue there has a lot of appeal to us.

A college administrator further reflected on the value of college-employer relationships and how they affect student employment.

The employer outreach coordinator has been huge…you create those relationships. You get the feedback that, you know, we're hitting the target or we're missing the target. We need to add

these skillsets or these competencies. You have the relationship. You can say, hey, you know what, I need an internship for, you know, Suzie. You know, do you have anything? And if you've got that relationship already, they're more apt to say, yeah, I can bring someone – because they know, they've worked with you. They've seen your grads. They're like, oh, these are, you know, good quality employees coming in, and give someone a great opportunity. That's something that I would like to see continue.

Receiving industry input through advisory boards also helped the colleges better prepare their students for the job search process. A LCC Dean explained,

Something we recently started which I think is really cool in conjunction with the advisory board meeting is that there are mock interviews for senior, last-semester students. Last time, the mock interviews actually turned out to be real interviews, and that was when a couple of the students were offered jobs. I think the advisory board is providing a direct connection to industry for our students, which is nice.

Ultimately, employers found that engaging with CHAMP enabled them to secure a better educated workforce. One employer said,

It is so hard to get people. The thing that constrains our growth the most is the availability of people. This is very much a self-interest being involved with them [the community college].

An employer working with PCC echoed this sentiment,

We were needing employees. And there wasn't (sic) enough kids there with a two-year degree. And so, they started sending us kids on the CHAMP program.

Even though college faculty are feeling positive about their students getting jobs after completing their programs, employers are still complaining that there are not enough people in the market. An employer connected with LCC said,

I think that they know what's required of our job and we keep hiring and using their interns in their machining program. … but right now we want two more and they can't find them for me.

The navigator working with Aims College bluntly said, "The challenge that I have here is we don't have enough students to fill the jobs that the companies would like filled."

PART III: BEST PRACTICES

Under CHAMP, employers and community college staff have demonstrated that working together results in mutual benefits and improve students' educational experience. Through college-industry partnerships, curricular changes were made to improve the knowledge, skills and readiness of students to enter the workforce. Students are also receiving more hands-on

experience in advanced manufacturing while they are working towards their credential—a direct result of a strong industry role in the partnership. Stepping back from the experience of CHAMP, a number of lessons were learned and best practices identified. For colleges and employers hoping to form such strong partnerships in their own industry and geographic region, the CHAMP experience suggests the following:

- **Engage employers early and often.** Beginning with the advisory boards, the CHAMP colleges were able to use employer input to design and maintain their programs.

- **Do not assume that employers will have a monolithic voice.** Although the employers engaged in CHAMP were all part of the advanced manufacturing sector, they did not always agree. Incorporating soft skills into the curriculum is a prime example of disagreement amongst stakeholders. Colleges facilitating advisory boards should be prepared to help groups of employers' work through their different perspectives about the best strategies to achieve common goals.

- **Employers and colleges may have different definitions of success.** Industry and college staff have different opinions about when it is appropriate to hire students. Employers are engaging with colleges to find better trained future employees. When interns and apprentices come to their companies, they are eager to hire them sometimes at the detriment of students completing their certificate or degree. Colleges are accountable for having students complete their programs and are assessed based on those numbers. Colleges and employers, therefore, need to be up front with each other about their ultimate goals and to be understanding of each other's needs.

- **Industry and colleges have different cultures and often work on different time tables**. Industry tends to move quickly and academic institutions tend to work more slowly. These differences need to be explicitly discussed so that a realistic timetable can be created. This can demonstrate the commitment of all stakeholders to achieve their common goal.

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