

Collaborative Partnership to address Workforce Education in a Rural Region: A Case Study

Abstract

Objective: This study examined factors contributing to the success of a rural workforce development collaborative initiative. **Background:** In 2011 a three year grant was successfully secured from the National Science Foundation (NSF) Advance Technology Education (ATE) program to address concerns of small and medium size manufacturing companies about the lack of skilled, entry level Computer Aided Drafting and Design (CADD) technician employees from the region. **Method:** A case study inquiry was used to explore the success of this collaborative partnership from the perspective of individuals playing essential roles and generate a deep understanding of the characteristic of this particular collaborative partnership. **Results:** Some themes emerging from the interviews and documents includes; having the right people at the table, commitment of team members, and effective group processes. **Conclusion:** Other rural areas with similar demographic and workforce development constraints can also benefit from the model used in in this collaborative initiative.

Keywords: Interagency Collaboration, Descriptive Model, Workforce Development

Collaborative Partnership to address Workforce Education in a Rural Region: A Case Study

Introduction

Collaboration is now seen as essential in addressing the complex issues experienced by education, workforce, and economic development (Austin, 2000; Gajda, 2004; Gajda & Koliba, 2007). Often these collaborations are characterized by partnering entities with different organizational structures, goals, and culture. Also these entities often do not have a history of working together to accomplish common goals. More collaboration between schools, business, and other agencies to improve educational systems is pragmatic in light of the many challenges educational institutions face today. Partnerships between business, industry, and educational institutions has become such an important strategic tool that congress has passed legislation to encourage more collaborative initiatives (Gray, 1989; Hughes & Weiss, 2007; Idelchik & Kogan, 2012; Peterson, 1991; Rubin, 2009; Slater, 2006; Thomson, Perry, & Miller, 2007; Woodland & Hutton, 2012).

Collaboration refers to working together and sharing responsibilities for results (Anderson-Butcher & Ashton, 2004; Gardner, 1999). Graham and Barter (1999) described collaboration as a “relational system in which two or more stakeholders pool together resources in order to meet objectives that neither could meet individually” (p. 7). Mattessich and Monsey (1992) defined collaboration as “a mutually beneficial and well-defined relationship entered into by two or more organizations to achieve common goals. The relationship includes a commitment to: a definition of mutual relationships and goals; a jointly developed structure and shared responsibility; mutual authority and accountability for success; and sharing of resources and rewards” (p. 7).

The need for collaboration may be more urgent in rural school districts where problems with capacity and resources are further pronounced. Attaining successful educational outcomes for these schools may mean partnering with diverse entities from the community and wider region. Such entities may include private enterprises in business and manufacturing, state run enterprises associated with the department of labor and commerce, and two and four year educational institutions. Partnerships may involve providing mentors, resources, and internship opportunities to support student learning.

Interagency collaboration exists “when two or more independent organizations, usually with different missions, develop formal agreements for working together toward a common purpose or goal” (Anderson-Butcher & Ashton, 2004, p. 41). Research shows effective public schools are built on strong collaborative relationships. While collaboration does not necessarily eliminate numerous problems with which many schools contend, it has proven critical in raising students’ performance (Anrig, 2014). For example, Bryk (2010) described key organizational features for advancing students achievement as 1) strong parent-community-school ties, with integrated support network and leadership that focus on cultivating teachers and 2) parents and community members who are invested in sharing overall responsibility for school and student performance to meet the need of society. New collaborative trends portray a diversity of collaborative partners never before experienced (Austin, 2000), and the models for such types of collaboration are many and include goals targeting proactive problem solving among students, classroom instructional support through special curriculums, mentoring programs in mainstream and service learning, internships, and occupational ladder and training for students exploring careers options (Anderson & Ashton, 2004).

Successful Collaboration

Successful collaboration requires formation of strategic partnerships among entities sharing similar values with clearly defined rewards for participation. Simultaneously, each partner’s goal(s) for participation must include enough overlapping vision to promote integration and collective action. The most productive collaborative partnerships are those in which each participating organization embraces a culture of collaboration (Austin, 2000; Gray, 1989; Woodland & Hutton, 2012).

Once appropriate partners are identified through common goals and vision, it is necessary to establish a clear plan of action with well-defined roles and expectations. Appointed members should be allowed time required to fulfill responsibilities associated with the project. They must be action oriented, competent communicators, and not be involved in too many activities as this can decrease effectiveness (Gajda & Koliba, 2007). Even when organizations are also the funding partners in a collaboration, individuals selected to participate on behalf of the organizations must internalize common project goals for success; avoid hidden agendas, unequal balances of power and conflict; and build trusting relationships (Leana & Frits, 2006; Nardi, 2005; Rubin, 2009; Slater, 2006; Thomson, Perry, & Miller, 2007; Woodland & Hutton, 2012).

While organizations commit to collaborative projects, the collaborative process itself is personal (Rubin, 2009). Therefore, individual membership appointments by organizations must be carefully selected to enable the partnership to be successful. Organizations must select representatives whose personal values reflect those of the organization as well as meshes with the goals of the collaboration.

Interagency collaborations can be difficult. Differences between agencies (even those in the same arenas) can be subtle or glaringly obvious. The team must address these differences before moving forward toward common goals. Language, acronyms, power differences, goals, levels of buy in, and organizational collaborative cultures all interplay to create challenges for an interdependent team to achieve specific goals (Gray, 1989; Peterson, 1991; Thomson, Perry, & Miller, 2007). Rubin (2009), explained “interinstitutional collaboration is a misnomer. Effective collaboration happens between people—one person at a time” (p. 99). A successful collaborative partnership consists of participating organizations or agencies that value a culture of inter-professional relationships and the process must deliver value to each participant (Austin, 2000; Woodland & Hutton, 2012).

In an effort to moderate individual’s expectations of the outcome of collaboration, Longoria (2005) stipulated that some researchers proposed the “concept of collaboration has powerful symbolic qualities, which perpetuates its popularity despite the lack of a clear pattern of evidence to support that inter-organizational collaboration results in positive outcomes for human service” (p. 128). Attempts to form collaborative partnerships can enhance an organization’s image and legitimacy, and give rise to civically engaged communities, thus enhancing social capital. However, outcomes may not always be positive. Insufficient resources can still limit what can be achieved as Whittington (2003) suggested “the potential of collaboration and partnership to function as ideology by concealing and perpetuating unequal power relations, disadvantage and benefits to sectional interests” (p. 29). Addressing collaboration in human services, Gardner (1999) said: “while the vision and rationale for joint work between specialist groups are powerful, there is yet insufficient evidence to argue that greater collaboration between services will necessarily produce better outcomes for all children and families” (p. 156).

Collaboration in North Central Idaho

In 2011 a grant was successfully secured from the National Science Foundation (NSF) Advance Technology Education (ATE) program to address concerns of small and medium size manufacturing companies about the lack of skilled, entry level Computer Aided Drafting and Design (CADD) technician employees from the region. The overarching goal of the *Creating a Regional Workforce for Rural Manufacturing* project was to strengthen links between schools and manufacturing in this rural region. Specific goals of the initiative included developing and testing a collaborative model to address regional workforce development needs to support small and medium size manufacturers. The project also addressed the struggle rural schools face in retooling students for careers in modern manufacturing by developing curriculum materials for CADD skills, implementing a mentor program between manufacturers and schools, and providing professional development for teachers of science, mathematics, and career and technical subjects.

North Central Idaho

Rich in natural resources, the North Central Idaho region historically relied on agriculture, timber, and government for its economy. However, the region endured a series of wrenching economic shifts over the last three decades, losing hundreds of jobs in leading industries. Between 1980 and 2012 thousands of jobs were lost: about 5,900 (54%) of forest product jobs; 1,900 (57%) of farm jobs; and 2,500 (67%) mining and smelter jobs. However, between 2001 and 2012, employment progressively grew in industries manufacturing metal products particularly in the recreational and agricultural sector such as hydraulic cylinder, agricultural equipment, guns and ammunition, and boats (Idaho Department of Labor, 2013).

The region's population is older than the national average; people 55 years of age and older comprise 30.3%. The population of young people between 15-24 years of age within counties containing the four year institutions is 16.7%. Much of this population, however, is comprised of transient students studying at the local colleges and universities and leaving after earning a degree. The high number of people 55 years old and older indicates the region is facing an extraordinarily high number of retirements and loss of institutional memory over the next several years. High retirement rates and growing industry combined with predicted skill loss means that, without intervention, the region faces significant workforce challenges (Idaho Department of Labor, 2013).

Northwest Intermountain Manufacturers Association (NIMA) documented challenges North Central Idaho industry faced through a manufacturer needs assessment performed in 2007. One hundred regional manufacturers identified development and retention of a quality workforce as the most critical industrial need. The Northwest Intermountain Manufacturers Association's survey also identified a negative perception among local school district administrators, youths, parents, and teachers regarding the long-term potential for rewarding and livable wage jobs in the manufacturing sector. Because of this negative perception, manufacturing was not promoted as a quality career possibility and some school district personnel were completely unaware of job opportunities in regional manufacturing (Clearwater Economic Development Association [CEDA], 2009). The NSF ATE initiative brought together several partners who shared the common goal of addressing a workforce development problem. Partners included two economic development agencies, six school districts, a manufacturing association, and two higher education intuitions. Common consensus was manufacturers needed a pipeline for Mechanical CADD technicians who could use proficiently the SolidWorks[®] modelling software; a software which ninety percent of the regional manufacturers used. The project lasted a period of three years, beginning July 1, 2011.

Purpose of the Study

This study examined factors contributing to success of the NSF ATE collaborative initiative. The goal is to inform other rural regions with similar demography and facing comparable workforce development needs. Similar collaborations conducted in rural settings can benefit from lessons learned about how effective processes were carried out and how participants contributed to success of the collaboration. This study was guided by the following research questions:

1. What factors contributed to the success this collaboration?
2. What descriptive model characterizes the collaboration?

Method

Research Design

An empirical case study inquiry was used to (1) explore success of the collaborative partnership from perspectives of individuals playing essential roles; and (2) generate a deep understanding of characteristics this particular collaborative partnership experienced to inform

practice of collaborations in rural settings. The collaborative partnership was chosen because of overall feelings of accomplishment at the end of the project (Creswell, 2007; Miles & Huberman, 1994; Yin, 2009). The NSF ATE project is bound by time when the group met to assimilate and carryout planned activities as well as institutional knowledge and experiences of participants involved in the project. Understanding what encompassed existing contextual conditions in view of the region's rural-ness is highly pertinent to the phenomenon being studied (Yin, 2009).

Procedure

Sampling

Critical sampling was used for the study. Critical sampling, a type of purposeful sampling procedure, targets individuals or research sites representing the central phenomenon. The aim is to study an exceptional case so researchers can gain in-depth understanding of a phenomenon (Patton, 2002; Creswell, 2012). For purposes of this study, individuals central to the project were considered critical samples. In addition, evaluation reports; agenda and minutes from planning meetings; yearly project reports; examples of project deliverables such as DACUM charts, mentor manual, and students' projects, were reviewed.

Participants

Eight persons playing key roles from each of collaborating partner were invited to participate in one-on-one in-depth interviews. Participants were contacted via email by the PI introducing them to a researcher conducting interviews and asking them to share contact information with the researcher. The purpose of the interview was communicated to each prospective participant. Participants were then contacted by the researcher to set up interviews at a date and location convenient to them and where they felt comfortable openly talking about the partnership.

All eight individuals invited to participate agreed to interviews. Manufacturers and economic development agencies were represented through individuals from CEDA, NIMA, and Valley Vision. The project PI and co-PI represented the training and education institutions. Additionally, individuals from the grant sponsoring institution were interviewed including: the grants manager, Tech-Prep coordinator, and professor who developed instructional modules and conducted project training workshops.

- Sample of Interview Questions:
1. Tell me about the Regional Workforce for Rural Manufacturing collaboration and overall timeline:
 - a. Relationships among collaborators
 - b. Your role in the collaboration
 - c. When it was formed
 - d. How was it formed?
 - e. How did the Collaboration progress / grow / sustain over the timeline of the project/grant?
 - i. Purpose? Did it address a need you saw?
 2. What was your motivation to join and motivation to remain a key player?
 3. What made the collaborative partnership effective?
 4. Did you have any agreements for how the group would work together? Where these agreements implied or explicit or how did they occur?
 5. How did your organization benefit? (Immediate benefits versus long term benefits)
 6. How do other partner organization's benefit?
 7. In your opinion, has the collaboration made an impact in the advancement of rural manufacturing in the community? Please explain.
 8. What role did each of the collaborators play? What contribution did each collaborator make?
 - a. Were roles formal or informal? How did leadership emerge?
 9. Discuss the evolution and roles of the partnership:
 - a. What did you have to modify/give up to make the collaboration work?
 - b. Did you have written or agreed upon objectives of the partnership?
 - c. Were all the partners equally committed to the process?
 - d. From your perspective did you have any difficult or unreliable partners and how did you manage that? Did you see manifested behaviors that needed to change?
 10. What efforts were made to nurture or sustain the collaboration:
 - a. Communication processes or Teambuilding?
 - b. Reinforcement?

Figure 1. Sample of interview protocol questions

Data Collection

A researcher familiar with workforce development and training, but not associated with the project conducted all interviews. A semi-structured interview protocol (see Figure 1) was used, allowing for variation in order and phrasing of questions including any additions to the protocol, such as further questions and probes to specific individuals, when appropriate (Creswell, 2007). Interviews lasted between 45-90 minutes, took place in amenable locations identified by participants and were recorded with permission of each participant. The same researcher transcribed all interviews verbatim. In addition to individuals from key agencies participating in the project, evaluation reports, agenda and minutes from planning meetings, yearly reports, and project deliverables such as DACUM charts, mentor manual, and student projects were reviewed.

Analysis

All interview transcripts and documents were read through to familiarize and review the data to gain an overall perspective and understanding (Crabtree & Miller, 1999) of the project. Data were then categorized and clustered into meaningful groups (Creswell, 2007; Stake, 1995). Initial categories were derived from interview questions rooted in factors believed to contribute to effective collaborations. Transcripts were reviewed several times and coded for themes emerging from each category (see Table 1). To ensure data trustworthiness, themes generated from the transcriptions were triangulated with documents from the project—project evaluation reports, agenda and minutes from meeting, DACUM charts, mentor manuals and student projects.

Table 1.

Themes and Codes

Categories	Themes
Successful collaboration	Who was at the table, roles, responsibilities Stakeholders, Shared purpose, Ethic of Contribution, Effective Group Processes, Creating Infrastructure, DACUM, Collaborators: Professional Experts, Having the Right people at the table, Working with what is, Relationships/Connections, Respect, Nurture / Sustain
Activities	Tasks, Task maintenance
Uniqueness	Mix of Collaborators/Partners, Rural nature/Issues
Issues	Challenges, Barriers, Communication
Lessons Learned	Things to do differently, Advice, Tips

Findings

As Table 1 illustrates, a total of five major categories emerged from interviews and were verified by examining other documentations and artifacts associated with the project. The categories and related themes are reported in respect to the research questions. Individual's names are changed in the reported verbatim.

Research Question 1: What factors contributed to the success this collaboration?

Successful Collaboration

Participants agreed that success of the collaboration could be attributed to several overarching factors. These factors included (1) having the right people at the table; (2) commitment of team members; (3) not allowing past history to interfere with goal attainment; (4) professional assets; (5) effective group processes; and (6) respect for one another.

The right people at the table. Participants agreed the team members brought together to complete the project were key to a successful collaboration. Role delineation was clear from the beginning of the project, and each team member's role was reemphasized and clarified during planning meetings as indicated in the following comments:

I understood that that was my role; it was up to me there was nobody else doing that portion.

We knew our roles because of who initiated the project, they started to take on a particular role, that was sorted out, then pretty much at each of our meetings we discussed matters and we assigned persons as to what they will be doing. This is what you will be working on.

Each member's role was carefully tied to a key function integral for interfacing entities involved in the project.

James knows that he is the one who has to get the teachers together to attend. James with his expertise from working in the tech-prep program, he knows the teachers he knows the schools, he knows the superintendents and the principals.

...there is no voice for manufactures except from me. Basically relaying information from me to them and from them to here and also to education and ...to establish new relationships with local manufacturers and their associated schools.

Each stakeholder's expertise brought to the project was considered essential and strategic in completing certain deliverables.

James and I worked hand in hand in some of this mentor/mentee stuff because he had relationships with the schools and I didn't. I had relationships with the manufacturers and he didn't. So it was a group effort to link the two.

Dan always had great ideas ... appreciate the fact that he speaks industry lingo as well as I know his profession, ... I am such a Dan fan; if he wasn't part of this I don't know how it would have succeeded. Kudos to him because he saw both sides and he spoke the language. I think if it was all academia focused it would not have made it, in my opinion.

Greg ... got the hands-on experience, he is able to excite students, put on demonstrations for teachers. He takes that theory aspect of it and puts it into play.

Commitment of team members. Participants spoke about the deep commitment each team member shared in accomplishing project goals. Every team member willingly put more time and effort into the project than was required or anticipated.

When it comes to deliverables I think we over delivered. When you look at the amount of resources that are available and when you look at the content that is in the STEM reflective guide, and the amount of professional development you have done for the teachers, I think we were able to deliver 100%. It also shows the level of commitment, because if people are not committed toward it, they will never over deliver, they will deliver the amount that is required or less. That shows level of commitment each of us had to this project to the point where we wrote another proposal that wasn't successful, because we wanted to sustain this and continue.

There were times when I know people were frustrated, but because of the level of commitment they decided to stick to it and get it done. The work that we put into this

project was much more than whatever remuneration that we get for it....out of this. It was much much more.

Not allowing past history to interfere with goal attainment. Partners in the collaboration experienced a shared history with each other. Often these shared histories were characterized by minor conflicts. Logistical issues also added to the mix. Any issue could have interfered with smooth functioning of the team individually and collectively. Transcripts indicated the team saw past these issues and worked towards achieving a team goal.

I realized ... working on the project that there was a lot of history that I didn't know about that also impacted what we were doing. Those histories are linked to politics, family, hurt feelings in the past, between collaborating organizations.

Everybody is in different locations, we are a pretty far flung group so try to make the meetings if you can, if you can't, we can make it a phone meeting, and Nadine has kept really good notes ...she sends out those and the minutes of the meeting, that is extremely helpful.

Being a rural area and having so many connections in fact a lot of people... many of them are advisors [on advisory boards] for our technical programs. ...watching everything and making sure everything is appropriate in terms of the connections and making sure there is not any kind of conflict, internal conflict with the grant....

Professional assets. Each team member brought professional and social assets, demonstrated through their relationships and connections with school districts and industry. These assets proved critical to establish and maintain contact and efficiently administer elements of the project.

... and her connection with industry, ...was amazing how much money they were able to pull into [the showcase]. It was great that they had that industry support.... I think that is the power of that industry connection that they have, they are working more closely with industry, they know industry cares about wanting to plug into education and they

speak more industry than they do education so they are able to make that happen more effectively...

To make sure we have really good relationships with all of our players. ...the biggest truth is that if we don't have relationship we don't really have anything to build on. ...My role is making sure relationships are well established and keeping us connected and keeping that clarity of information and intent kind of moving.

He tells kids "here's what you look for in a machine" so he was a big help.... So its all these relationships that is the big key here. What makes the partnership effective? – its relationships, getting to know these guys and working with them that's making it

Effective group processes. Participants pointed to several key group processes they felt were important in setting a foundation for an effective project. These processes included conducting a DACUM workshop, preparing teachers and mentors for the mentorship program, advancing the workforce development council, and clarifying roles.

What is critical ... is the method of the DACUM process. ...Figure out the tool we could use to get where we need to go. Before that we had no vision of how to do it. And ...with this project, he is able to do the first DACUM and by golly the manufacturers loved it! They liked the process! You don't know how difficult that was.

Those planning the meetings that we did quarterly and we also had MOUs in place so we could make sure that expectation was delineated and that we also had something to go back to as players changed because sometimes that happened. I think those were the tools that helped us work together effectively. Clearly delineating roles ... were the things we all agreed were critical in moving the work forward.

I think mechanisms were put in place that basically made this collaboration automatic. The workforce development council was an integral mechanism for an institutional ...that was put in place that brings people from the various institutions together at one table to talk about problems. You have people from economic development association were

involved with the project, people from the same schools were involved in the project, people from the manufacturing who were involved with the project.

Respect for each other. Another key relational element identified is respect each team member held for others. This respect allowed for effective communication and quick resolving of issues as they arose.

The relationships have been very collegial and everyone has been working towards the ultimate goals of the program or the project.

I think what made it effective was we had mutual respect for each other and their expertise. I think that is what really made it work. I never did try to tell Christine how to do her work and neither do I try to tell Carla how to do her work, or James or the others. I would provide advice and they would ask me for advice and none of them tried to tell me how to do my work.

Research Question 2: What descriptive model characterizes the collaboration?

Uniqueness

Interview transcripts and documents revealed the project initiated a unique collaborative model not accomplished before in North Central Idaho. Several sub-themes relating to this unique initiative included the mix of collaborators/partners, rural issues, and outputs.

Mix of partners. The project was initiated by the Clearwater Economic Development Association (CEDA) and was based on an assessment of regional manufacturers' workforce development needs as identified by the labor department and NIMA. Results indicated an urgent need for workers with CADD training, and CEDA recognized the need for partnership with the technical and four-year institution in that region.

This project was initiated by CEDA and NIMA and they brought LCSC on board, because for them to apply for funding from NSF ATE (advanced technology education) funding, the PI should be from community or technical college. So the leadership role for this project, while clearly defined by NSF which expected the PI to be taking the leadership role...

The nature of NSF ATE grants require a principal investigator be from a technical college. However, each entity involved was responsible for carrying out major aspects of the project. From the beginning CEDA played a key role in bringing the schools districts and manufacturers together. CEDA hosted various planning and dissemination meetings with the project team, school leaders and manufacturers. Later, they organized a DACUM workshop, mentorship program, and the mentor and mentee showcase. CEDA played a crucial role in bringing three cultures—higher education, economic development, and manufacturing—together to discuss and address workforce development issues. Combined, they were able to interpret data about workforce development issues and translate data into actionable events through consultation with higher education and manufacturers. Typically entities involved in this project do not work together; bringing three separate cultures together had its challenges.

Right off the bat I realized there was a huge variety of cultures one being education, one being industry, economic development. In my limited experience I haven't seen quite that much of a collaboration between those industries before. This project brought together a lot of different cultures that wouldn't be brought together. So I thought that was a pretty big accomplishment in itself.

The challenge has also to do with different cultures of education, economic development, and manufacturing. All these three, and this is what has made this project interesting and difficult, because literally we kinda talk different language, our motivations and our purposes for doing things are different and we have different time lines on what, how fast things should be moving and all that kind of thing.

Rural Issues. All partners coalesced around a common issue, addressing the need of more skill workers in manufacturing, particularly in CADD. This partnership will help to stem outward migration of young people from the region because of their inability to obtain gainful employment.

In industry they don't realize the barriers in education, they want their employees, they do not understand why they are not getting them

They have ... have some strong small business manufacturers that are growing. We need to help them...the long-term benefit to the region is sustainability and economic diversification ...where more money is being brought in and kept in and circulated ...so we need to see growth.

To this day, it is a big issue for the manufacturers that they can't find workforce that are willing to live in rural areas. It's just a big issue and I feel like something has to happen.

Activities

Tasks and group maintenance. Transcripts revealed that during meetings the focus was to complete various tasks. Individuals were freely commended for progress during the project.
we always ...look at the tasks, that was good...when we meet at a meeting, the atmosphere was always good. There were a few jokes, we were not afraid to commend each other.

Communication processes during meetings needed to be task oriented ...so that the tasks would get done. I determined in my mind that was the most important thing to get the task done and to reach the goals, and I think it worked that way.

Activities aimed at maintaining group relationships seem to evolve naturally as they worked together.

Our maintenance was more in the form of reinforcement that we got from the things that we did and the results that we got. For example, when we had the showcase with the students, that was very reinforcing for us, and I never got the impression that anyone felt overworked or exhausted.

...there were certain things that we were doing that were implicitly maintenance oriented that we might not have been aware of.

Issues

Participants perceived several issues throughout the project as constituting challenges and barriers to progress. These issues included recognizing the scope of the project was beyond what

the budget could cover; pace at which administrative processes are carried out varied from institution and agencies; and communication language among institutions, agencies, and manufacturers differed.

...there is not enough money, and as with any project, you start out enthusiastically and gosh I know it is not enough ... by the time you get to the end of the three years there are other things that come up that really need to take precedence whether you want them to or not.

One barrier is speed; industry likes to think they move really fast, and obviously economic development and education moves a lot slower. That's one barrier in regards to the collaboration with industry. ...how we communicate with each other wasn't necessarily the same. As educators when we communicate with people from the economic development association with the manufacturers, we have to ensure we communicate in a way they fully understand what we are saying.

Outputs

Several major outputs resulted from the partnership. Early on, partners developed a DACUM chart outlining a competency profile for entry-level Mechanical CADD technicians. The professional development workshops for math, science, and technology education teachers that followed aimed at developing competencies identified in the DACUM chart. Other outputs included a mentorship program, mentor guide, mentor and mentee showcase. The descriptive model in Figure 2 illustrates partnering agencies, roles, and outputs.

Agencies and Roles

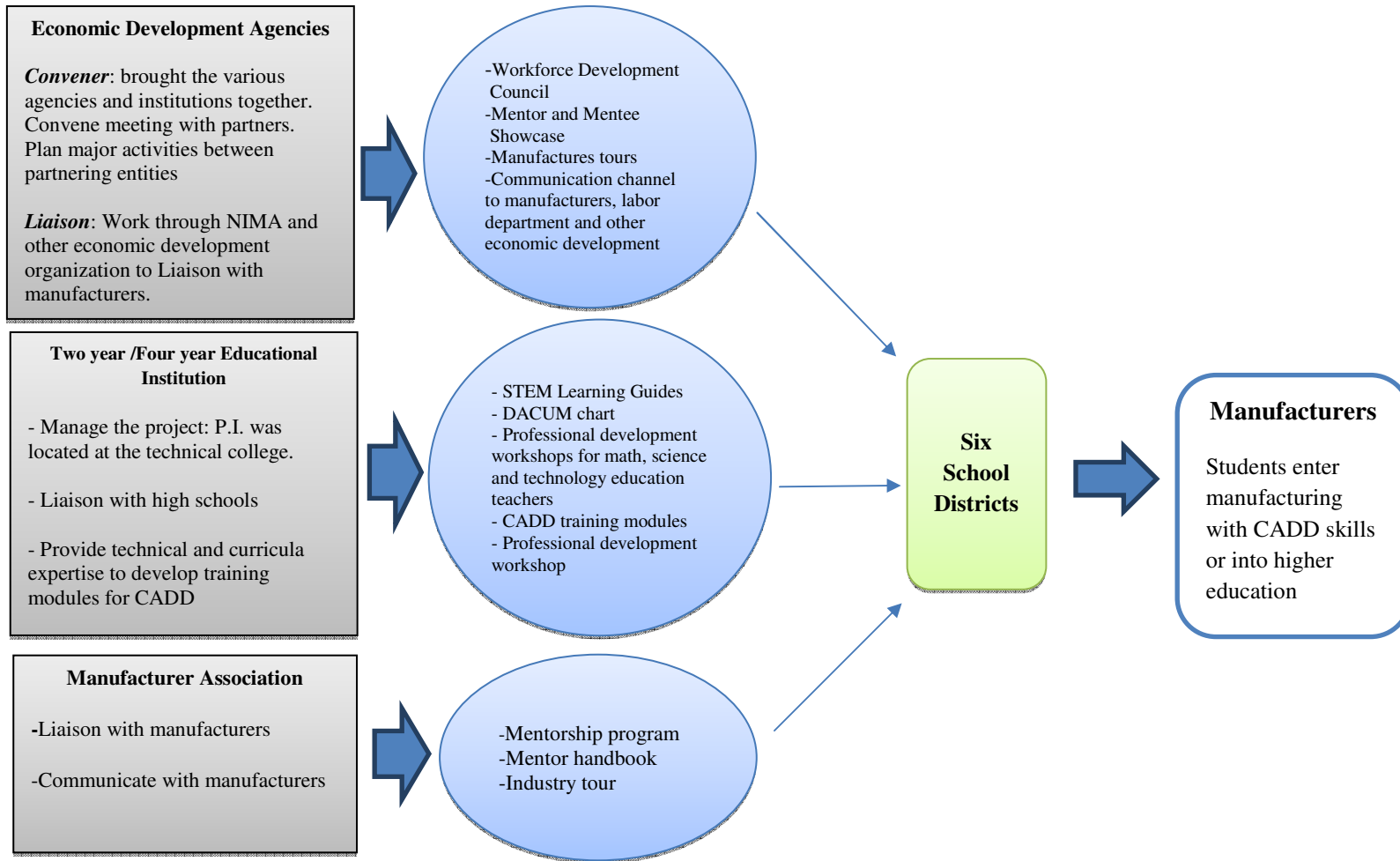


Figure 2. Descriptive Model

Discussion

The results support factors contributing to success of any interagency collaboration. These factors include the right person involved in collaborative efforts, and team members' commitment to the process. Team members committed to the process and outcomes allow for internalization of the project goals, and increase the likelihood of commitment and perseverance to completion (Rubin, 2009; Slater, 2006). In fact this motivation, termed as "felt need" (Hocevar, Jansen, & Thomas, 2011), is an organization's "recognition of interdependence with others and the acknowledged need to collaborate in order to effectively accomplish its mission and goals" (p. 3). This need is developed from a perceived threat or problem, triggering a particular response, or it can be motivated by opportunity for proaction or prevention. The problem in this context was the lack of entry-level workers trained in CADD and the challenges this posed for regional manufacturers. Additionally, partners voiced concerns for high school graduates who choose not to go on immediately to college for various reasons, but do not possess the skills required for employment in manufacturing. Many of these graduates migrate from the area to obtain jobs with livable wages.

Each team member brought professional assets to the project which played an integral role in effectively and efficiently addressing program deliverables. Distinctive deliverables include DACUM charts, Mentor/Mentee Handbooks, CADD training modules consisting of video recordings showing specific solid modeling techniques relating to area industries, mentorship program, workforce development council, student and mentor showcase, and professional development workshop for STEM teachers. The members' technical and interpersonal expertise built team confidence and developed mutual respect among team members. This respect outweighed past negative experiences within the cooperating agencies. The literature agrees collaborative networks can give rise to social capital, enhancing effectiveness and legitimacy of the partnership (Putnam, 1995; Provan & Milward, 2001). In fact this lateral mechanism of interagency collaboration provides hard and soft skills important for proper function. A by-product is collaborative learning, demonstrated through learning about interests and capabilities (and limitations) of other agencies and systematic assessment of lessons learned to improve future collaborations (Hocevar, Jansen & Thomas, 2011).

While communication can be a challenge in any partnership, this collaboration was not defined by poor communication. Issues concerning roles were resolved early in the project, and a

communication mechanism was enacted to ensure effective communication was achieved, particularly between manufacturers and the school districts. The team appreciated each member's expertise, pointing to a level of acceptance of individual's differences. Communications mainly focused on task—towards getting things done. While expertise superseded individual's personalities, personal styles and dispositions enhanced the team's effectiveness. Flannes and Levin (2001) admitted a prerequisite to good communication is “recognizing personal style is important, but what is also needed is to have the “right mix” of personal styles and personalities. The right mixture is glue that holds the team together during rough periods in the project” (p. 92). The unique position of NIMA and CEDA made them ideal to spearhead communications with manufacturers while the technical college spearheaded most communications with the school districts.

The descriptive model in Figure 2 illustrates the unique partnership in North Central Idaho. It describes the agencies, their roles, associated outputs and beneficiaries. The partnership was established to address a pressing issue and each agency continues to collaborate after the project's completion to explore other ways to address workforce development needs. The models' utility might benefit other rural regions exploring how to form partnerships to address specific needs or issues in education. Economic agencies played an important role in linking data from labor to education and convening various partners to conceptualize a strategy to address the region's workforce needs. The educational institutions and manufacturing agencies also played key roles by expending human capital and providing resources. As articulated by the Shared Value Initiative (2014), businesses, schools, and governments all play essential roles in overcoming regional skills gaps through collaborative initiatives that transcend silos to partnership. Such efforts has the ability to address shared skill gaps at scale, resulting in profound impact on manufacturing workforce needs in a region and enduring partnership between education institutions, community organizations, and state agencies governments.

Conclusion

The challenges that schools with limited resources and business in rural regions face, particularly in workforce development, can be addressed through collaboration with various agencies. Such collaborations are not easy, but are strategically important in addressing problems individual agencies find difficult to tackle alone. This study presents the experience of

such a partnership in North Central Idaho. All team members and other stakeholders declared the project a successful interagency collaboration. The authors think other rural areas with similar demographic and workforce development constraints can also benefit from the model used in Idaho. The challenges faced by education and business in deep rural regions merit the scrutiny of collaborative models deemed to be successful in other regions to determine their goodness of fit to address workforce development issues in their region.

Acknowledgement

This material is based upon work supported by the National Science Foundation under Grant No. 1104078. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

References

- Anderson-Butcher, D., & Ashton, D. (2004). Innovative models of collaboration to serve children, youths, families, and communities. *Children & Schools, 26*, 39-53.
- Anrig, G. (Winter, 2013-14). Cultivating collaboration: The science behind thriving labor-management relationships. *American Educator, 37*(4), 4-13.
- Austin, J. E. (2000). *The collaboration challenge: How nonprofits and businesses succeed through strategic Alliances*. San Francisco, CA: Jossey-Bass.
- Bryk, A. S. (2010). Organizing schools for improvement. *Phi Delta Kappan, 91*(7), 23-30.
- Clearwater Economic Development Association (CEDA). (October, 2009). The clearwater economic development district: Comprehensive economic development strategy. Clearwater Economic Development Association, Lewiston, Idaho, Chapter XI, 1-26
- Crabtree, B. F., & Miller, W. L. (Eds.). (1999). *Doing qualitative research* (2nd ed.). Thousand Oaks, CA: Sage.
- Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Thousand Oaks, CA: Sage.
- Creswell, J. W. (2012). *Educational Research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Columbus, OH: Pearson.
- Flannes, S. W., & Levin, G. (2001). *People skills for project managers*. Vienna, VA: Management Concepts.
- Gardner, R. (2003). Working together to improve children's life chances: The challenge of inter-agency collaboration. In J. Weinstein, C. Whittington, & T. Leiba (Eds.), *Collaboration in social work practice* (pp. 13-38). London, England: Jessica Kingsley Publishers.

- Gardner, S. (1999). *Beyond collaboration to results: Hard choice in the future of service to children and families*. Tempe and Fullerton: Arizona Prevention Resource Center and the Center for Collaboration for Children, California State University.
- Gajda, R. (2004). Utilizing collaboration theory to evaluate strategic alliances. *American Journal of Evaluation*, 25(65), 65-77. doi: 10.1177/109821400402500105
- Gajda, R., & Koliba, C. (2007). Evaluating the imperative of intraorganizational collaboration: A school improvement perspective. *American Journal of Evaluation*, 28(1), 26-44. doi: 10.1177/1098214006296198
- Graham, J. R. & Barter, K. (1999). Collaboration: A social work practice method. *Families in Society: The Journal of Contemporary Social Services*, 80, 6–13.
- Gray, B. (1989). *Collaborating: Finding common ground for multiparty problems*. San Francisco, CA: Jossey-Bass.
- Hocevar, S. P., Jansen, E., & Thomas, G. F. (2011). Inter-organizational collaboration: Addressing the challenge. *Homeland Security Affairs*, 7, 2-8. Retrieved from <https://www.hsaj.org/articles/64>
- Hughes, J., & Weiss, J. (2007). Simple rules for making alliances work. *Harvard Business Review*, 4, 1-10.
- Idelchik, M., & Kogan, S. (2012). GEs open collaboration model. *Research Technology Management*. Retrieved from http://www.iriweb.org/Public_Site/RTM/free/GEs_Open_Collaboration_Model.aspx
- Idaho Department of Labor. (2013). *A report on the general economic conditions in North Central Idaho*. Retrieved from <http://labor.idaho.gov/publications/lmi/pubs/IdahoProfile.pdf>
- Leana, C. R., & Phil, F. K. (2006). Social capital and organizational performance evidence from urban public schools. *Organization Science*, 17(3), 353-366.
- Longoria, R. A. (2005). Is inter-organizational collaboration always a good thing? *Journal of Sociology and Social Welfare*, 32(3), 123-138.
- Mattessich, P. W. & Monsey, B. R. (1992). *Collaboration: What makes it work: A review of research literature on factors influencing successful collaboration*. St.Paul, MI: Amherst H. Wilder Foundation.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis* (2nd ed.). Thousand Oaks, CA: Sage.
- Nardi, B. A. (2005). Objects of desire power and passion in collaborative activity. *Mind, Culture, and Activity*, 12(1), 37-51. doi: 10.1207/s15327884mca1201_4
- Patton, M. Q. (2002). *Qualitative evaluation and research methods* (3rd. ed.). Newbury Park, CA: Sage
- Peterson, N. L. (1991). Interagency collaboration under Part H: The key to comprehensive multidisciplinary, coordinated infant/toddler intervention services. *Journal of Early Intervention*, 15(1), 89-105.
- Provan, K. G. & Milward, H. B. (2001). Do networks really work? A framework for evaluating public-sector organizational networks. *Public Administration Review*, 61(4), 414–425.

- Putnam, R. D. (1995). Bowling alone: America's declining social capital. *Journal of Democracy*, 6(2), 65–78.
- Rubin, H. (2009). *Collaborative Leadership*. Thousand Oaks, CA: Corwin.
- Shared Value Initiative. (2014). The new role of business in global education. Retrieved from <http://www.fsg.org/tabid/191/ArticleId/1047/Default.aspx?srpush=true>
- Slater, J. J. (2006). Creating collaborations: from isolationism to community. *International Journal of Educational Management*, 20(3), 215-223. doi: 10.1108/09513540610654182
- Stake, R. E. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.
- Thomson, A. M., Perry, J. L., & Miller, T. K. (2007). Conceptualizing and measuring collaboration. *Journal of Public Administration Research and Theory*, 19(1), 23-56. doi: 10.1093/jopart/mum036
- Whittington, C. (2003). Collaboration and partnership in context. In J. Weinstein, C. Whittington, & T. Leiba (Eds.), *Collaboration in social work practice* (pp. 13–38). London, England: Jessica Kingsley Publishers.
- Woodland, R. H., & Hutton, M. S. (2012). Evaluating organizational collaborations suggested entry points and strategies. *American Journal of Evaluation*, 33(3), 366-383. doi: 10.1177/1098214012440028
- Yin, R. K. (2009). *Case study research: Design and methods*. Los Angeles CA: Sage.