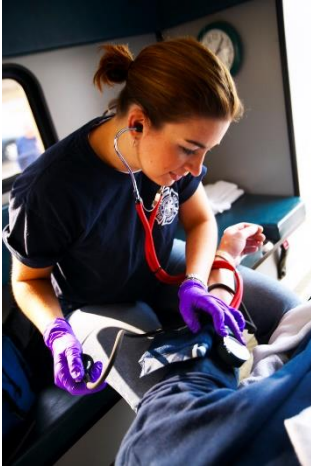




Applied Learning Institute

today's learning - tomorrow's opportunities



The Applied Learning Institute

Overview of processes, challenges, and directions for the future

J U L Y 2 0 1 4

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Summary

The Applied Learning Institute (ALI) was founded in 2006 to revitalize technical education in Northeastern Minnesota. To achieve this, ALI gathers local school districts, colleges, and employers to discuss how local education can prepare students for success with college and employment. The result is a strong pipeline—from high school to college to employment—that strengthens the regional economy.

ALI receives funding through a state budget allocation to the Minnesota State Colleges and Universities (MnSCU) system. Most of the funds are distributed to local high schools through grants, which are used to purchase industry-standard equipment. Through collaboration with its wide range of partners, ALI ensures that the new equipment and software aligns with what is being used by local colleges and employers. The program also coordinates outside activities that support this pipeline, from employer presentations at local high schools to college visits for students. Both students and instructors emphasize the value of these face-to-face meetings.

This evaluation finds that the program has already demonstrated evidence of success:

- Students gain exposure to a variety of careers, hands-on experience, and the confidence that their high school education has prepared them for college and future employment.
- High school instructors have seen greater interest in their courses, which many believe directly relates to the addition of new equipment. For most schools, purchasing this new equipment would not have been possible without external funding.
- College instructors report higher-quality students and an increase in enrollment. Though these observations cannot be directly attributed to ALI, instructors felt ALI was a driving force.
- Employers value the chance to work with key partners in education to communicate their needs. They view investment in this communications pipeline as an asset to the region that makes the region more attractive to employers. Some said that ALI has already contributed to higher-quality job candidates.

Stakeholders believed ALI would continue to be successful and benefit students, schools, and employers. Most thought the initiative would also benefit the regional economy by building a stronger workforce.

Many stakeholders felt that there was little that ALI needed to improve. Their primary recommendations were to:

- Provide funding for consumable materials, such as metal and drill bits
- Provide additional training and support for high school instructors
- Increase participation of high school instructors within the collaboration
- Ensure consistent emphasis on education and careers in all ALI courses

During interviews with stakeholders, a few key issues surfaced that warrant further discussion. Stakeholders expressed divergent opinions on the following issues:

- Many stakeholders—employers in particular—wanted ALI to expand or be replicated in other areas. External stakeholders were generally in favor of expansion of ALI; they wanted to open membership to schools across the state. ALI leadership believes that much of the program’s success stems from its unique regional focus, and that other areas of the state should adapt the model to suit their region.
- Some stakeholders—primarily high school instructors—were concerned that ALI was shifting its focus from two-year, industrial technology training to preparation for four-year engineering programs. This may relate to the introduction of courses like Math for the Trades and Introduction to Engineering.
- Some instructors feel that the emphasis on college credit reduces student opportunities. ALI recently limited funding to programs that provide college credit for students. Some certificate programs—which are regulated by national trade groups—do not recognize credits awarded outside of higher education institutions, so high schools will no longer receive funding for these programs. Affected programs include ALI’s advanced automotive track, which does serve a growing industry in the region.
- In our survey of ALI students, about one in five (19%) felt that their ALI coursework was too challenging or they were not given enough time to complete it. Several of these students named specific difficulties with math. However, most stakeholders felt that ALI courses were valuable because they were challenging, and that high expectations are essential for the outcomes they have seen. ALI instructors and leadership may want to discuss if certain courses should be restructured or if specific elements of the curriculum should be prioritized.
- Most students only learned of ALI and its unique opportunities *after* entering an ALI course, and many of the students had not heard of it until they were asked to

participate in our survey. Though ALI has a host of benefits, most students decided to take the courses because they interested them. ALI's opportunities give students the chance to secure college credit, earn vocational certificates, visit local colleges, and work with local employers, which could attract students who may not otherwise be interested. Most stakeholders agreed that marketing or branding of ALI could be expanded to attract more students. However, some felt that no additional marketing was necessary, or that students do not need to know what ALI is to understand the benefits of the courses. Further discussion is needed to determine if marketing would benefit the goals of the initiative and, if so, how the process should be implemented.

Looking to the future, stakeholders believe ALI will help Northeastern Minnesota become a regional technology hub. Part of this vision includes a mobile technology lab that will expose more students—particularly younger students and those in rural areas—to industrial technology education and careers. Stakeholders felt the program has had a positive impact on educational practices and partnerships, and they value continued funding and expansion of the program.

About the study

Between November 2013 and May 2014, Wilder Research worked with ALI leadership to collect the perspectives of students, educators, employers, and key ALI leaders about what was working well about the program, what could be improved, and what had changed because of it. Individual interviews were conducted with five leaders and founders, nine regional employers and business group representatives, and 15 educators, including high school teachers, counselors, and administrators, and college faculty. Student feedback was collected through an in-class survey completed by 399 high school students enrolled in ALI classes. The student survey was developed based on input from two earlier focus groups and interviews with four individual students. This report synthesizes the data collected from all of these sources.

Overview

The Applied Learning Institute (ALI)'s primary goal is to support industrial technology education in Northeastern Minnesota. The initiative grew out of the Iron Range Resources and Rehabilitation Board (IRRRB), which leads a variety of projects serving the Taconite Assistance Area, which spans 49 cities and 15 school districts. ALI funds new industrial technology equipment and instructor training in schools, all while sponsoring activities that connect high school students to local colleges and employers.

Prior to the creation of ALI, there had been significant divestment in high school “shop” programs throughout the region. Schools lacked the funding to support these departments, and administrations favored coursework that led to bachelor’s programs. For students interested in technical education, there were few course options and little guidance. According to college instructors, many of the students who did pursue a two-year technical education were unprepared for the coursework.

At the same time, demand increased for industry professionals in welding, engineering, and other hands-on careers. These careers were also changing: industrial technology was advancing, and the new machinery required more skilled employees to use them. Employers had difficulty finding candidates with a two-year degree. They noted that new employees were often underqualified or would struggle with basic elements of the job, requiring extensive investment in training. Many new employees were from other regions of the state or country, and they would leave their positions to move home after a couple years on the job. Employers lamented the lack of qualified, local candidates to fill the position.

In 2006, a group of sixteen superintendents, higher education officials, and regional developers met to discuss this problem. They aimed to build a network of K-12 schools, colleges, and employers to support students interested in technical education. In the end, they settled on a single goal:

The goal of ALI is to help create highly trained, knowledgeable workers who are equipped with the technical and problem-solving skills needed by employers everywhere.

The group found a passionate champion in former State Representative Tom Rukavina—who, at the time, was also the Chair of the House Higher Education Committee—and the other members of the Iron Range delegation. Representative Rukavina worked with this group of legislators to allocate \$1 million annually to the Northeast Higher Education District (NHED) to fund ALI initiatives. Former IRRRB Commissioner Sandy Layman also realized the economic development importance of renewing technical education in

northeastern Minnesota and provided a \$100,000 workforce development grant to the Applied Learning Institute for the purchase of new equipment. The ALI concept had become a reality. ALI's relationship with the IRRRB has continued to grow and today the ALI Director is a joint employee of both the IRRRB and NHED.

This evaluation sought perspectives from key stakeholders—students, educators, employers, and the organization's leadership team—to identify successes, challenges, and directions for the future of the program.

ALI's model

In the classroom, ALI supports alignment between teaching at high schools and colleges. Community colleges share a set of guidelines with high school instructors, who then adapt them to meet their students' needs. Students who successfully complete ALI courses receive college credit. All ALI courses utilize an applied learning model, which emphasizes hands-on practice and skills.

Though most of ALI's funding goes to schools for equipment and training, ALI supports other events and programs related to its mission. These include:

- Employer and college visits for high school classes
- Employer and college instructor presentations at high schools
- Equipment exhibitions for instructors
- Job fairs for regional employers

ALI functions within high schools to facilitate college-level learning in high schools. Two additional projects, Iron Range Engineering (IRE) and Education Innovation Partners, have grown from the spirit of collaboration established by ALI.

- Iron Range Engineering (IRE) offers engineering students the opportunity to earn a four-year degree in engineering. There are no four-year institutions within the ALI service area, and Minnesota law currently prohibits community colleges from granting four-year degrees. However, regional leaders—many of whom are an integral part of ALI's leadership—worked with Minnesota State University – Mankato to create an accredited four-year engineering program co-located on the Virginia campus of Mesabi Range College.
- Education Innovation Partners (EIP) was launched in 2013 to engage communities, higher education, and K-12 school districts to improve education in northeastern Minnesota. The goal of EIP is to provide students throughout the region with equal access and the opportunity for a world-class education regardless of zip code. In order to accomplish this, the following three initiatives have been identified: individualized career plans for students; teaching and learning academies for professional development for educators and administrators; and an integrated regional technology plan.

These new collaborations expand opportunities for ALI students and develop a framework for expanding the project-based learning model in other areas.

Study methodology

A number of qualitative and quantitative approaches were used to assess ALI's work. Data collection took place between November 2013 and May 2014. The four key groups of stakeholders in our analysis were students, educators, employers, and ALI leadership.

Leadership

Five of ALI's founders and leaders were interviewed to give a broad perspective on the work: Sue Collins, Ron Dicklich, Joe Sertich, Tony Sertich, and Roy Smith. They shared information about the stated goals of the program, its progress to date, and the climate that precipitated the work.

Employers

Staff conducted nine interviews with regional employers and business groups. Two represented professional associations, while six were large regional employers and one was a smaller, local employer. Of the seven employers, four were primarily mining companies, two were engineering firms, and one was a manufacturer. A partner in the health care sector was unable to be reached despite multiple attempts. However, one of the professional organization representatives was able to speak to the health care market.

It should be noted that employers could not distinguish ALI students from students in traditional programs. For this reason, comparisons between ALI and non-ALI students should be interpreted with caution.

Educators

A total of 15 semi-structured interviews were completed by educators, both at the high school and college level. About half (53%) of those interviewed were instructors of industrial technology courses in local high schools. Two high school counselors (13%) and two administrators (13%) were also interviewed. Administrators had a strong connection to ALI: they both participated in the design of the project and were active in the collaboration. Most of the instructors interviewed were responsible for obtaining and operating the ALI equipment in their buildings, while the counselors had only come into contact with ALI through their professional roles. One instructor could not respond to our request due to maternity leave.

Three key members of the college faculty were also interviewed, comprising 20 percent of key informant respondents. Each played a key role in their respective programs: health

care, engineering, and welding. Please note that, in most cases, college educators said they were unable to distinguish between ALI students and those who had come through traditional programs. Some had rough estimates—for example, the percentage of their students that came from the ALI service area—but the topic was rarely discussed in class. Therefore, their comments about ALI students should be interpreted with caution.

Students

During November 2013, staff interviewed four college students who had taken ALI courses while they were in high school. These students were recommended by instructors to ALI for participation in the evaluation. At the time of the interview, one was pursuing welding, and three others were involved in two-year mechanical engineering programs. Their high school coursework had focused on welding, engineering, and automotive repair. These interviews were used to develop a protocol for the focus group discussion.

On January 31, 2014, two discussion groups were held in Chisholm, Minnesota with students who had taken a variety of ALI courses. Four of the 31 students were currently enrolled in college, but most students were still in high school. Nearly three-quarters (74%) of the students were male, and most (94%) identified as white. Over half (61%) were primarily involved in industrial technology courses, while others were involved in health care and engineering (Figure 1). A few students had also taken other courses that benefited from ALI funding, such as digital photography. Students who primarily studied the trades were assigned to one discussion group, and those who were involved in other ALI fields—including engineering—comprised a second group. Students also completed a questionnaire, and all received an honorarium for their time. Focus group responses were used to frame the student survey; they are also highlighted anecdotally throughout the report.

1. Primary focus of students' ALI coursework

	Student Survey (N=395)	Focus Groups (N=31)
Industrial technology (e.g. welding, woodshop, autos, machining, or similar courses)	54%	61%
Engineering	37%	16%
Health care	1%	23%
Other (e.g. digital photography)	8%	0%

In March 2014, a student web survey was distributed via e-mail to a list of ALI course instructors, who administered the survey during class time over a period of two weeks. In all, 399 high school students accessed the survey. Most students (54%) said that trade classes—welding, woodshop, machining, automotive repair, or similar courses—were the main focus of their ALI coursework (Figure 1). Engineering students comprised 37 percent of respondents, and small number (8%) said their ALI coursework had focused in other areas: outdoor skills, technical math, and digital photography were represented. Only one percent of survey respondents had focused on health care. Again, most respondents were white (92%), while 78 percent reported that they were male, 19 percent were female, and 3 percent identified as other.

Only 11th and 12th grade students are eligible to receive college credit for their ALI coursework; these are the students who are in traditional ALI classes. However, the program does not restrict the use of their equipment and software to accredited courses. In many schools, younger students use ALI equipment in courses that serve as a precursor to ALI classes, such as technical math. Nearly half of student web survey respondents (46%) were in the 9th or 10th grade (Figure 2). If not otherwise noted, responses are for all students, 9th through 12th grade. When appropriate, tables will also include a subset of responses for 11th and 12th grade students.

2. Current grade level for ALI student respondents

	Student Survey (N=385)	Focus Groups (N=31)
9 th grade	30%	0%
10 th grade	16%	0%
11 th grade	26%	26%
12 th grade	29%	61%
First year of college	0%	7%
Second year of college	0%	7%

Note: Due to rounding, percentages do not sum to 100%.

In the student survey, most students said they were interested in attending college or some other post-secondary program. Over three-quarters (78%) planned to attend two- or four-year college, including 36 percent who planned to work while attending school. Meanwhile, 5 percent planned to enter the military, 4 percent intended to pursue employment alone, and 9 percent weren't certain of their plans. Four percent of students had other plans, which primarily consisted of apprenticeships or one-year vocational programs, such as lineman school.

Successes and strengths of ALI

According to stakeholders, ALI is an overwhelmingly successful initiative in terms of the student impacts, strength of the collaboration, and the program's impact on employers, the community, and the region.

Impressive student impacts

Stakeholders agreed that ALI has a positive impact on students' education and opportunities. Not only did students enjoy their courses, but their projects set the stage for their future education and employment. Several stakeholders felt that the successes of the program would positively influence region.

Exposure to a variety of careers

During our interviews and focus groups, students said that they appreciated the connection ALI builds between school and career. Over one-third (37%) said that their coursework's connection to careers was one of the most valuable aspects of the class, and 63 percent said that their ALI coursework has influenced their expected career choice "a great deal" or "quite a bit" (Figure 3). Student survey respondents felt the classes helped deepen and expand their understanding of careers:

- 91 percent of students said ALI gave them a better idea of what careers look like in a given field.
- 84 percent of students said that ALI introduced them to new career options within their field of study.

Students' exposure to a wide variety of careers clearly aligns with stakeholder values. Most employers believed that exposing students to a variety of fields should be ALI's primary goal, and that a broad introduction was more valuable than students gaining any particular skills or knowledge during high school. In doing so, students would build a better understanding of which fields appealed to them, saving time and money on higher education and limiting post-hire career changes.

ALI leadership and employer partners have supported career exploration through presentations and site visits, which students identified as an important aspect of their connection to careers. Sixty-three percent of student survey respondents said that ALI impacted their decisions about their future career "a great deal" or "quite a bit," which could be directly related to the connection with employers (Figure 3).

-
3. How much would you say that your participation in ALI classes has influenced your decisions about your future...?

	Education (N=392)	Career (N=386)
A great deal	25%	26%
Quite a bit	41%	37%
A little	25%	26%
Not at all	9%	11%

Hands-on training and experience

ALI’s applied learning model helps students gain valuable skills inside and outside of the classroom. Almost half (47%) said that learning a “real-world” skill was one of the most important aspects of their ALI coursework, while one-third (34%) named “hands-on learning” as one of the most valuable.

In the classroom, high school students can earn credentials that can help them secure well-paid employment earlier than other students. Some earn certificates—for example, level-one welding or a certified nursing assistant (CNA) certificate—even before graduating from high school. This increases the number of opportunities available to them after high school graduation, as well as the level of compensation. Since more than one-third (36%) of students plan to work while attending college, these certificates may provide additional opportunities for employment during school.

Through ALI’s connections with employers, students are also introduced to a number of large and small businesses in the area. For instance, an international car company recruited ALI classes to make dashboard parts using their new equipment. Students have also been involved in projects with other local companies, which benefits both students and local employers.

It's amazing to see [employers'] reaction to what students are learning. They come up to me and say, "They're learning robotics? Automation? I have this I need to be welded." They're bringing students in, and it ends up being a great mentoring program... [Employers] are saying to students, "Come into my work, shop, office—help me learn these new processes." It really gives these students a sense of accomplishment, knowing that they can go on to the next level. They don't just do it in school, they do it in the community.

– Brandon LaDoux, Instructor, Bigfork High School

Based on these experiences, students may be more likely to pursue employment in the field, or even with specific companies that offer internships or employment. The skills

learned in ALI classes have even inspired entrepreneurship. After taking an Advanced Automotive course, one student started his own business buying and selling vehicle parts.

Confidence to pursue higher education

All three of the college instructors interviewed believe that ALI has increased technical school enrollment within the region. Though the increases may stem from a variety of factors—employer demand and the recession among them—nearly all instructors said ALI makes college more accessible for students.

During interviews with high school and college instructors, one word was repeated again and again: confidence. Through ALI, high school students are able to visit local technical colleges and see what college-level coursework looks like. Several instructors said that having high-tech equipment in ALI classes inspires confidence in their students, which is compounded when students see the equipment in use:

Every year we tour local technical schools—there are a few different instructors who let us come. One thing I noticed is that these kids aren't always sure of themselves. They think, "If I go to technical school for welding, everybody will be good, and I won't know what I'm doing." Since we got the new equipment, something I noticed is that, when we tour technical schools or industry, the first thing they say is, "We have that same stuff, I can do that." They know they can handle it, and it builds confidence. It's like a light bulb that goes off in their heads

– Joe Gabardi, Instructor, Nashwauk-Keewatin High School

In addition to experience and exposure, students leave ALI courses knowing they can succeed at college-level coursework. By pursuing courses that offer college credit, students become increasingly confident in their ability to excel in college, and these credits allow them to get a head-start on coursework and save money on tuition. In the student survey, three-quarters of 11th and 12th grade students (76%) said that the ability to earn college credit influenced their decision to take an ALI course. In all, 78 percent of students planned to attend a two- or four-year college after graduating, and two-thirds of students (66%) said that ALI has influenced their decisions about their future education “a great deal” or “quite a bit” (Figure 4).

4. Students thought there was a clear connection between what was happening in class and how it could serve as a step toward...

	All students (N=388)	11th & 12th grade (N=210)
Higher education (2-year, 4-year, or certificate program) in the field of study	90%	91%
Paid employment in the field of study	89%	91%

Strength of collaboration

Interviews with stakeholders revealed that the collaboration is successful. Overall, partners share goals and find meaning in their relationships with collaborators.

Factors of success

Based on conversations, it seems ALI's success hinges on four key factors:

1. Responding to needs of the region

According to ALI leadership, creating a shared vision and utilizing the region's shared culture was vital to this effort. At heart, the initiative supports the primary industries on the Iron Range. ALI leadership emphasizes that programs elsewhere should not try to replicate this work, but rather adapt it to suit local needs and build on regional strengths.

2. Building a strong alliance

The idea for ALI was born without funding: provosts, superintendents, and future ALI leadership gathered monthly to develop a plan for improving technical education in the region. According to Joe Sertich, the founder of ALI and CEO of Sertich Consulting, taking time to build relationships was essential. If there was a change in leadership, engaging the new person in their role became a priority.

3. Making time to discuss challenges

One of the key challenges for K-12 and higher education partnerships is funding: if high school students attend courses outside of the high school, funding is transferred from the district to the college. Partners took time to talk about these challenges and arrive at the mutually-beneficial solution of concurrent enrollment. ALI's position as a neutral convener facilitated this process.

4. Identifying a secure funding source

ALI leadership believes that one of the primary factors for success is having a secure funding source. This funding, which comes from the legislature's allocations to MnSCU, allows schools to expand programs and plan for additional staff. Partner districts are asked to pay membership fees, which increases buy-in from schools.

Stakeholders share goals

Instructors and employers were asked to describe their overall goals for the initiative. Three goals were prominent in both groups. Each was identified by 27 percent of educators and 22 percent of employers.

- Students will gain exposure to a variety of career fields.
- Students will have expanded opportunities and curriculum at the high school level.
- Students will understand the value of a 2-year degree and be better prepared to pursue college coursework.

One-third of educators (33%) hoped that ALI would further align student experiences with workforce needs and expose students to industry-standard equipment. All of these goals are currently addressed by ALI programs.

Employers—who are more involved in the collaborative aspect of ALI—hoped that the communication between educators and employers would continue: 22 percent said that this would be one of their top priorities.

Meaningful for all partners

This collaboration has been meaningful for partners across sectors. All interview respondents believed that ALI was on the right track, and most had already seen evidence of success. According to partners, the following have been made possible by ALI:

- High schools connect with advances in industry and expand curriculum accordingly.
- Colleges increase enrollment, receive higher-quality students, and secure new equipment.
- Employers identify key partners and communicate workforce needs.
- Politicians and developers leverage the program to attract employers and funding to the region.

With respect to the collaboration, the partners' only concern was the level of participation by high school instructors in ALI leadership activities. One educator felt that high school instructors should be included in a wider array of meetings and contribute further to the planning of the work. Currently, only high school leadership—principals, superintendents, and other administrators—is deeply involved in planning.

Supports local employers, the community, and the region

Both college instructors and employers spoke highly of the pipeline created by ALI. This pipeline exposes students to technical careers early, gets them into college, and helps them become high-quality workers.

Meeting the needs of employers

Employers say that the ability to identify key partners in education and communicate workforce needs is incredibly valuable to them. ALI is already addressing the majority of needs identified by employers during their interviews. When employers were asked to name general skills that they felt ALI could help teach, the most common responses were the ability to:

- Communicate effectively with coworkers
- Perform and understand basic math skills, such as measuring
- Continue learning and developing skills as technology changes

In partnership with local community colleges, ALI has already developed curriculum to teach these key skills. Its project-based learning model ensures that students spend large amounts of time working in groups to build communication skills. Responding to the need for math skills, ALI helped develop a Math for the Trades course, which specifically teaches applied uses for math. Meanwhile, the state-of-the-art equipment used in ALI courses helps students prepare for today's high-tech industries much more than they would in a traditional "shop" class.

Anecdotally, it appears these efforts have been successful. One large regional employer believed the initiative is having a direct impact on its millwright candidates:

What we've seen over the years is growth in the millwright program through Mesabi [Range College]... We test the millwright classes. Over the last seven years we have seen improvement. Whether that's due to the millwright program itself or to ALI, we can't pinpoint which, but we clearly can say that we are seeing more people interested in the program. The more people you get in the pool, the better chance you get higher quality workers.

As described earlier in the report, ALI also sponsors a number of additional events that connect students and employers, including job fairs. These events help employers meet their hiring needs by connecting qualified candidates to opportunities within the region. By being responsive to these needs, ALI supports its students and external stakeholders to achieve their goals.

My last year [at MN Power/Allete], we hired a number of young people that heard about us through connections, job fairs, and opportunities that were driven by ALI. It's only going to grow, and it has helped.

- Inez Wildwood, Chair, Governor's Workforce Development Council, formerly MN Power/Allete

Giving back to the community

ALI helps build community among its partners, and also helps students build a closer relationship with community. Joe Sertich, CEO of Sertich Consulting and the founder of ALI, said that the partnership between ALI-sponsored building construction classes and Habitat for Humanity was one of the most surprising results of the initiative. Building construction students have partnered with their local chapter of Habitat for Humanity to build houses in their area, which has made an incredible impact on the students and the community:

We start the year and go over safety, and from there we build a whole house. We set in forms, rebar—we do everything but the electric, heating, and plumbing. Every year when we have a dedication it's amazing. I have been teaching over 20 years—before we would build little sheds, now we build a house that someone moves into. That would never have happened without ALI.

– Terry Vesel, Instructor, Hibbing High School

Students also learn to give back to the community through their experience with ALI. One educator shared the story of a former ALI student. After graduation, he attended a local two-year school for engineering, and then transferred to ALI's partner program, Iron Range Engineering (IRE), to earn his four-year engineering degree. He has since been managing engineering projects and intends to recruit ALI students to contribute to his projects.

Supporting the regional economy

Many respondents felt that job opportunities will ultimately drive population growth in a given area. By educating youth to work in local industries, this helps to guarantee the longevity of the region.

On an individual level, stakeholders felt that ALI lays the groundwork for economic mobility in the region. One college instructor described it this way:

It already has and will continue to make a difference for access to higher education and careers in technology and engineering. That's what ALI does. It provides access to those who would not have had it, and it makes a huge economic impact in our region. We're educating more engineers than ever and have a greater demand than ever, so young people are vertically climbing the socioeconomic ladder. This impacts local economies through the work they do and the professional salaries they earn.

– Ronald Ulseth, Director, Iron Range Engineering and Professor, Itasca Community College

Teachers and employers alike believe that students are most likely to settle down in the region where they attend college. According to employers, it is challenging for regional businesses to attract and retain workers. New employees require extensive training and investment, and employers find that many employees from outside the region move if possible. Employers and instructors believe that by encouraging local youth to pursue careers in the region, they will attract and maintain a more stable workforce.

By exposing students to the wide variety of careers available on the Iron Range, students may be more likely to settle there. In the student survey, 63 percent of students thought the region would “definitely” or “probably” offer a career in their field of interest at age 30 (Figure 5). Three in five students (60%) said that their ALI coursework made them consider staying on the Iron Range because of the employment opportunities connected to the training they’ve received.

-
5. Imagine the type of job you might like to have when you’re 30. Do you think you’ll be able to find that type of work on the Iron Range?

N=387	Percent	N
Yes, definitely	27%	103
Yes, probably	36%	140
No, probably not	14%	56
No, definitely not	6%	24
I’m not sure if it will be available	7%	27
I’m not sure what job I want to have when I’m 30	10%	37

Areas for growth

Most respondents felt that ALI was on the right track, and only shared suggestions for improvement when asked directly. The following are the most frequently named suggestions from stakeholders.

Suggestions for funding

The most frequent suggestion from educators was for funding of consumable materials at the classroom level. Four instructors mentioned this, specifically naming items like wood, metal, drill bits, and gloves that are used in large quantities. These goods can be expensive, especially when ALI class sizes are increasing rapidly.

Two educators suggested streamlining funds to make bulk purchases and secure lower prices. Those in charge of purchasing the equipment also described difficulties associated with the timing of the funds. Funds become available at the beginning of the fiscal year, but instructors must align these funds with programming during the academic year. One educator felt ALI should identify someone to negotiate prices. It's possible that little could be done to change the timing of the funds, but organizing purchases could result in significant savings.

Additional support for high school instructors

High school instructors were interested in additional support from ALI. Two educators believed that additional training and professional development would benefit teachers. They lamented that some educators only receive equipment training from vendors when more could be done. Others were interested in additional training to identify more uses for existing machines.

For some instructors, ALI courses pose a significant time commitment. Educators talked about the additional time required to write grants, then to purchase and learn to use the equipment. A couple instructors were also responsible for marketing ALI at their schools, which requires an additional time commitment. One suggested that teachers should receive additional compensation for their role in the work. An administrator summarized this feeling, saying, "If you don't have the teachers that spend this extra time, it wouldn't fly. We could have the best equipment in the world, but if you don't have the right person teaching, it wouldn't happen." Some educators noted that buy-in was more common from younger instructors, who may be more willing to take on the additional commitment.

High school instructor participation

Some educators felt there should be more opportunities for high school instructors and ALI leadership to connect, as well as for K-12 instructors to meet with one another to collaborate. In particular, discussing curriculum and teaching methods could be helpful for making curriculum adjustments and improvements. Since instructors receive little direct feedback about the performance of their students at community colleges, they rely on hearing from students who have entered the programs. Sharing feedback from students may help instructors improve their curriculum.

With respect to interacting with leadership, one college instructor suggested that high school instructors should be invited to more meetings with leadership. High school instructors wanted to see more ALI leadership in their classes to talk with students and experience the classes. In the student survey, youth also wanted to see more of ALI leadership and stakeholders in the classroom. Students and instructors may appreciate additional work with ALI leadership, though more information is needed to determine how high school instructors would feel most comfortable participating.

Consistent emphasis on education and careers

It seems that ALI courses may not universally emphasize the connection to careers evident in most ALI curriculum. In our focus groups, who focused on courses outside of industrial technology and engineering courses said that career options were not as obvious to them—the same students were less likely to know what ALI was. These students would likely benefit from the conversations about career and higher education that occur in other ALI classes. Strengthening the career focus in these courses could help ALI brand itself as a leader in pathways to technical careers.

Topics for discussion

Many suggestions from respondents touch on more complex questions related to the program's organization and focus. In many cases, arguments were equally persuasive from both sides. These issues merit further discussion from leadership and stakeholders.

Expanding or replicating ALI

ALI's success has inspired significant interest in expanding the program. Employers, in particular, suggested including other parts of Minnesota in the work, adding new fields of study, and requiring schools to participate. Both employers and instructors suggested expanding course offerings.

ALI leadership plans to diversify course offerings as needed, but are hesitant to expand into other regions of the state. Additional stakeholders may diminish ALI's intensely regional focus—its shared mining history—which is one of the driving factors of its success. The concentration of resources is also key to moving forward as a regional technology center. To complete this vision, there are still multiple initiatives that require time and funding to complete, such as the mobile lab. Even within Minnesota, expansion may add competition for enrollment and funding.

Nevertheless, members of the leadership team *would* like ALI to be used as a model for replication, and they intend for it to benefit districts on a national scale. ALI's leaders would like to first expand their work in Minnesota through their Education Innovation Partners initiative, which incorporates much of ALI's model into its statewide plan.

The students own it as much as we do. I think about the power this has to be replicated. We need this in other high schools, we need this in other regions. We must start working together in integrated learning systems

--Sue Collins, President, Northeast Higher Education District

Industrial technology and four-year engineering

Two instructors voiced concerns about ALI's support of four-year engineering programs. With the development of IRE, some feel that ALI is beginning to emphasize four-year engineering degrees over two-year degrees. Similarly, one instructor felt that ALI has shifted the focus from industrial technology to a more "science and academic side." Though he did not elaborate, this could have to do with more extensive incorporation of physics and math into the curriculum through courses like Math for the Trades, which prepares students to use math in applied settings.

Others appreciated ALI's support of four-year engineering programs and STEM work. One participant suggested expanding ALI to facilitate graduate degrees in fields like business and construction management. Others spoke favorably about IRE, believing that it should receive more funding to develop its four-year programming. Meeting with high school instructors to determine specific concerns may help ALI ensure instructor buy-in, even as the program evolves.

Focus on college credit

Most agree that earning college credit during high school is valuable for students. Indeed, it saves them money on tuition. Many students enroll in ALI courses not knowing that they will receive college credit; however, 76 percent of 11th and 12th graders said the ability to earn college credit or save money on tuition factored into their decision to take the course.

Nevertheless, some instructors feel that the emphasis on college credit has become too strong. One instructor lamented that ALI has discontinued funding for programs that could not offer college credit, such as the automotive program. Though these courses represent a growing Minnesota industry, the industry accreditation standards prevent credit from being offered during ALI courses. One college professor illustrated this point:

I think that the Applied Learning Institute should be focused on learning and not on credit. We're more concerned that our students have the skills and abilities than they have the credit. When the focus is on the credit, which is where parents and legislators put it, when we graduate our students they're much less capable to meet needs than if we spent time to teach high-quality learning experiences and not be focused on credit.

Other instructors described the drawbacks of the ALI credit system. For example, an engineering course may earn a student college credit, but due to industry standards, these credits cannot count for an engineering degree. They will still likely save the student money on general education courses, but not for the student's major. These standards are governed by a national body and cannot be amended locally, which may surprise and confuse students seeking credit.

Challenging coursework

Students were asked to name the most significant drawback to ALI courses. They most frequently said that coursework was too difficult or the course was too fast-paced. This was mentioned by 19 percent of students, which includes the 3 percent of all students who specifically named challenges with math. Comparatively, nearly three in ten students (28%) said that nothing could be improved, and 6 percent did not know what the biggest

drawback was. Some students suggested that fast-paced courses should be offered as year-long courses instead of during a single semester.

Though some students may struggle, it is worth noting that much of the confidence built by these courses comes from challenging material. Diminishing the rigor of the courses may reduce students' ability to perform in college and confidence in taking on this coursework. College instructors insist that ALI primes students for college expectations, which ultimately results in college students who are more successful. If this is a concern, ALI leadership could meet with college and high school instructors to determine the best course of action.

Marketing to students

For many students, ALI is relatively invisible. During our focus groups, many students said they only learned about earning college credits after enrolling in the course. In our web survey, half of the already-enrolled ALI students (51%) said they had never heard of ALI before the survey was distributed, and another 14 percent weren't sure if they knew the term (Figure 6). Older students—11th and 12th graders, those eligible for college credits—and students whose ALI coursework focused on industrial technology were more likely to be familiar with the program.

6. Were you familiar with the term ALI or Applied Learning Institute before you received this survey?

N=396	All students (N=396)	11th & 12th grade (N=211)
Yes	35%	42%
No	51%	46%
Not sure/don't know	14%	12%

When asked whether ALI should be further marketed to students, instructors were divided. Most K-12 and college faculty agreed that ALI should be better advertised to students. However, there was debate about whose responsibility it should be to promote the program. Some respondents suggested that school counselors or a “technical advisor” would be the best fit. Several felt that representatives from ALI should have a greater presence in the classroom. Some instructors said they spend a significant amount of time to promoting ALI, but the time commitment was challenging on top of their teaching responsibilities, especially without compensation.

There were also respondents who felt that ALI should *not* be marketed to students. One suggested there was already too much pressure on students to pursue college-level

coursework and credits. A couple thought students who would ultimately be successful in these courses would take them without any additional marketing. Others felt that marketing simply wasn't necessary: even if students don't understand what ALI is, it has met its goal of increasing enrollment and interest in industrial technology courses. These individuals argued that ALI is already known by those who use the information—instructors—and students would have no use for the information.

If additional marketing were pursued, there would be a multitude of ways to spread the word about the program. Students suggested advertising the fun projects and equipment used in ALI courses, as well as having older ALI-enrolled students talk about the program with middle school youth. Two instructors emphasized the importance of reaching younger students, either in middle school or early high school. In the student survey, 63 percent of respondents said they would “definitely” recommend ALI courses to others, and several youth said the program should be expanded to include younger students. Creating an ALI Ambassador program—in which older, ALI-enrolled students speak to younger students about the program—could be an effective means of marketing.

Vision for the future

All those interviewed felt that ALI was headed in the right direction. When looking toward the future, respondents envisioned the following additions to ALI’s web of programming:

Mobile technology labs

Instructors and leadership both value the idea of a mobile technology lab. The lab would allow high school and college instructors to travel to schools across the region to share equipment. Currently, equipment sharing occurs through informal arrangements—for example, if a high school does not have the capacity to run or purchase certain equipment, college instructors may offer to have classes use equipment in college labs. A mobile lab would facilitate that sharing and expand ALI’s capacity to work with students, particularly those in rural areas and younger students, such as middle school groups. In combination with an expanded marketing effort, this would undoubtedly be an effective tool for marketing the purpose and value of the program. As high schools become saturated with high-quality equipment, this is the next logical step.

Regional technology center

Multiple respondents hoped the combination of ALI, IRE, and other work inspired by the mining industry will create a type of regional technology hub in Northeast Minnesota. One instructor hoped that ALI could inspire a “center of excellence” model, similar to the approach taken by Minnesota’s state universities. ALI leadership certainly intends for this to be a concentrated initiative with implications for regional economic development. ALI’s first director, Mark Adams, hopes it will be used to attract well-qualified employees and lasting employment:

The end result is to prepare and provide students with amazing, world-class technology—to create a school system in Northeastern Minnesota, from Pre-K through 16, for our learners to be engaged and trained. If they choose to leave, we want to find some way for them to come back to raise families by providing economic opportunities. We want to be as attractive as we can in education and also to the business and industry engines that drive our economy.

-Mark Adams, Superintendent, Greenway and Nashwauk-Keewatin Public Schools

Areas for future research

Conversations with stakeholders revealed the need for an in-depth look at additional topics. Multiple stakeholders emphasized the need for continued evaluation and additional data, which are described below.

Impact on remediation

When it was created, one of ALI's primary goals was to reduce the need for math remediation in two-year colleges. Employers and instructors both said that students would often arrive at college—or even graduate from college—without an understanding of basic math, such as measurement skills. Interviews suggest that progress in this area has been mixed; however, concrete evidence of success could have implications for the model's use on a larger scale.

Continuous improvement

Employers and educators both stated the importance of continuous improvement of the ALI model. They urged ALI's leadership to not rest on their success. Instead, they stressed the need for ongoing evaluation and a clear understanding of impacts, particularly related to college enrollment. Two employers said that the initiative deserved additional funds to continue improving the model and working with partners to develop an increasingly holistic program.

Creating a data system

The primary barrier to further research is the lack of ability to track students as they enter college. ALI should work with MnSCU to establish a system for flagging ALI participants within the MnSCU database. Remediation and other indicators could then be tracked for students who pass through the program, providing additional data to support success of the initiative.