SOUTH DAKOTA ENERGY CAREER PATHWAYS

Interim Evaluation Report

John Swanson

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February 2017

Technology & Innovation in Education learning is our work

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- Mitchell Technical Institute's (MTI) *South Dakota Energy Career Pathways (SDECP)* project is developing and delivering a comprehensive energy career pathways program to address growing workforce needs in the South Dakota's energy and utilities industries.
- MTI is the only post-secondary institution in South Dakota to offer the following five programs, which are the target of SDECP's efforts: Power Line Construction and Maintenance (PL), Propane and Natural Gas Technologies (PNG), Industrial Maintenance Technology (IMT), Electrical Utilities and Substation Technology (EUST), and Utilities Technology (UT).
- The SDECP project features an outreach and recruitment component, prior learning assessments, foundational skills assessments, curriculum development, program enhancements, a Professional Development Center for instructors, and job-specific training—all supporting the employment of program completers.

Evaluation Design

- The main goal of this program evaluation is to collect information from a variety of sources to inform adjustments to the program and to estimate its overall effectiveness.
- The evaluation includes an implementation analysis as well as an analysis of program results in the form of participant outcomes.
- The outcomes analysis describes the extent to which outcome measure targets are being achieved and includes a static-comparison group design to compare retention and employment outcomes between grant and non-grant participants.

Implementation Findings

- The SDECP project involves 14 different activities to address four main strategies. 12 of the 14 activities are currently assessed to be at "full implementation".
- MTI worked with the U.S. Department of Labor to create a four-year Registered Apprenticeship program for the Power Line Construction and Maintenance program.
- Students are involved in all aspects of constructing the electrical substation known as the "outdoor lab". 100% of students surveyed reported that the outdoor lab enhances their learning.

Participant Impacts and Outcomes

- Performance on five of the nine outcome measures surpassed their targets in each of the first two years of the project.
- During the first two years of the project, 224 adults have earned certification in one of the SDECP programs. This represents almost 90% of the targeted goal for the entire project.
- Retention rates in the five SDECP programs, as defined as the percentage of students graduated or retained, are exceeding MTI's average retention rate as well as the retention rate in South Dakota Technical Institutes as a whole.

Conclusion

- The SDECP project is making excellent progress with implementation and achievement of outcome goals. Most activities are at full implementation, and most outcomes are exceeding target goals.
- MTI should prioritize outreach activities during the remainder of the grant to more fully address SDECP's first strategy, *increase the number and diversity of project participants through marketing, recruiting, and outreach efforts.*

TAACCCT Program/Intervention Description and Activities

Introduction

In October 2014 Mitchell Technical Institute (MTI) in Mitchell, South Dakota was awarded a four-year grant from the US Department of Labor's *Trade Adjustment Assistance Community College and Career Training* Grants Program (TAACCCT) for the *South Dakota Energy Career Pathways* (SDECP) program. The TAACCCT grant program focuses on the following goals.

1. Increase the number of adults earning certificates, degrees, diplomas, and nationally recognized certificates in two years.
2. Replicate effective methods for designing and delivering instruction that address specific industry needs and lead to improved learning completion, and other outcomes for TAA eligible workers and other adults.
3. Improve employment outcomes of participants.

In order to address these three overarching goals of the TAACCCT program, Mitchell Tech's *South Dakota Energy Career Pathways (SDECP)* is developing and delivering a comprehensive energy career pathways program to address growing workforce needs in the South Dakota's energy and utilities industries. It features an outreach and recruitment component, prior learning assessments, foundational skills assessments, curriculum development, program enhancements, and job specific training—all leading to the employment of program completers.

SDECP is based on the Center for Workforce Development's *Get Into Energy* career pathways model and is organized around the four main strategies listed below. A number of activities and deliverables are in place to address and document each strategy.

1. Increase the number and diversity of project participants through marketing, recruiting, and outreach efforts.
2. Develop and deliver an industry-endorsed Energy Careers Pathway Model that provides multiple entry and exit points and stackable credentials for Energy and Utility programs.
3. Expand and enhance MTI's capacity for student retention and student services to support a diverse student population.

4. Expand and enhance MTI's capacity for program improvement and innovative instructional delivery.

Project Leadership

Mitchell Technical Institute is one of four technical institutes operating in South Dakota. Its vision is to *be an innovative leader in technical education and a valued partner in global workforce development, preparing students for career success and lifelong learning in an ever-changing world*. It offers more than 30 programs, several completely online, and a variety of certifications, diplomas, and Associate of Applied Science (AAS) degrees. MTI is accredited by the Higher Learning Commission (HLC) and is currently governed by the South Dakota Board of Education.

MTI's campus is located on 80 acres along Interstate 90 in Mitchell, SD. Mitchell has a population of approximately 15,000 residents. In fall 2014, MTI student enrollment was approximately 1,259. Demographic data shows that a majority of students are male (69%), Caucasian (94%), between the ages 18 and 24 (82%), and employed (68%). Almost three out of four students are from areas within 150 miles of Mitchell. Population centers within this radius include Sioux Falls, Aberdeen, Brookings, Watertown, Yankton, Pierre, Huron, and Vermillion.

The direct responsibility for grant leadership and management is shared by two MTI staff members. John Heemstra, the Vice President of MTI, has extensive experience with grant management and coordination, including experience with TAACCCT grant programs from Rounds 1, 2, and 3. DeAnna Hatch is Grants Manager at MTI and has vast experience with project coordination, data analysis, and grant management.

Programs

MTI is the only post-secondary institution in South Dakota to offer the following five programs, which are the target of SDECP's efforts. Program brochures for each of the programs can be found in **Appendix A**.

1. The **Power Line Construction and Maintenance (PL)** program trains students on the distribution and transmission of electrical power. Job tasks include installing and maintaining power lines, operating a digger derrick truck, setting and climbing poles, and installing transformers. Career opportunities include apprentice lineman, distribution engineer, and utility assistant. PL is a nine-month program resulting in a one-year diploma as well as a Qualified Climber Certificate, a Pole-Top Rescue Certificate, SD Flaggers certification, and a Commercial Driver's License (CDL).

2. The **Propane and Natural Gas (PNG)** program trains students on the installation, maintenance, operation, and repair of propane and natural gas distribution equipment and systems. Career opportunities include gas technician, propane service, and propane delivery. The PNG program is a nine-month program which results in a one-year diploma. The PNG program is currently being transformed into the Natural Gas Technology program due to changes in the energy industry.

3. The **Industrial Maintenance and Controls Technology (IMT)** program trains students on maintaining and optimizing the operation of commercial facilities (e.g., plants, factories, hospitals). This includes repair and maintenance of equipment. The existing one-year program is being expanded through SDECP efforts to become a new AAS program. This will allow students to continue their studies for a second year, where they may focus on electrical or heating and cooling systems. IMT career opportunities include maintenance technician, process technician, building maintenance mechanic, maintenance mechanic, equipment technician, and facilities technician.

Two IMT students have received *Double Edge* scholarships from MTI. The *Double Edge* program involves a local business sponsoring a student at MTI in return for a three-year agreement the student signs to work for that company. *Double Edge* enhances the existing *Build Dakota* scholarship program by connecting students to local employers as they begin their program of study. *Build Dakota* is a scholarship program funded by T. Denny Sanford and the state of South Dakota for students entering high-need workforce programs at in-state technical institutes. *Build Dakota* scholarships are available to in-state and out-of-state students. Those who are awarded scholarships must commit to stay in South Dakota to work in their field of study for three years.

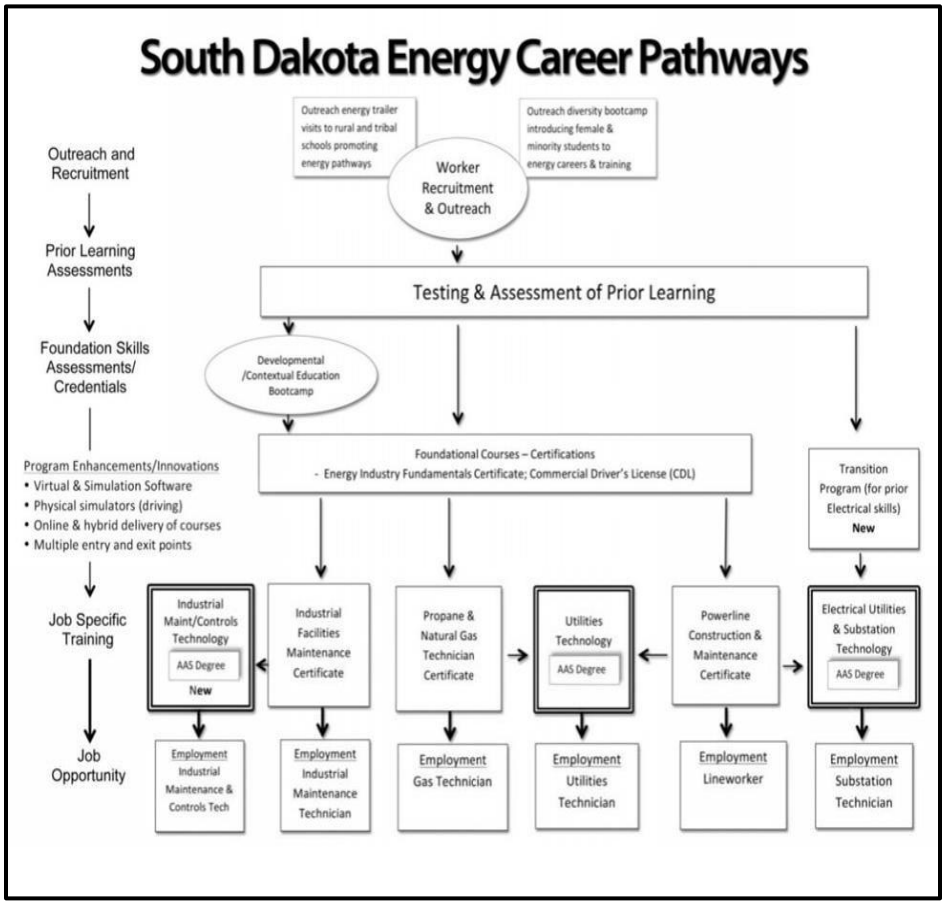
4. The **Electrical Utilities and Substation Technology (EUST)** program trains students on installing, repairing, and maintaining equipment in electrical substations or other facilities on the power grid. This includes electrical engineering skills used during the design and construction of substations. Career opportunities include journey worker, relay technician, substation technician, and utility technician. EUST is a one-year program which results in an AAS degree when "stacked" on the Power Line Construction and Maintenance program. EUST can also be a third year diploma option for the current Electrical Construction and Maintenance, Automation Controls/SCADA, and Wind Turbine Technology AAS programs.

5. The **Utilities Technology (UT)** program is an opportunity for students to obtain a more robust education by combining energy programs of study to earn an AAS degree. The UT-PL degree can currently be earned by completing both the PL and PNG diplomas. UT-PL career opportunities include combination service technician, apprentice line technician, apprentice line worker, and gas technician. The UT-Heating and Cooling degree is a combination of the PNG and Heating & Cooling Technology (HCT) diplomas. UT-HCT career opportunities include HVAC service technician, propane service & delivery, gas appliance technician, and sales. As stated earlier, the PNG program is being replaced with a Natural Gas Technology (NGT) program. Beginning in the fall of 2017, students can combine the new NGT program with either the PL

program or the GPS/GIS Mapping Technology program to earn an AAS degree in Utilities Technology.

Initially, the SDECP intended to offer students the opportunity to complete the Energy Industry Fundamentals (EIF) Certificate and/or the National Career Readiness Certificate (NCRC). In working with MTI's Energy Advisory Boards and the Dakotas Energy Workforce Consortium industry partners, it was determined that there was not a significant employability value to either of these credentials. Most of the material covered by the EIF is covered in the programs taken, but there was no interest in defining an additional credential to reflect this. The NCRC has not yet found it place among SD employers. While the instructional staff would be happy to support a student's interest in the NCRC, none have needed it to this point.

MTI's vision for its Career Pathways Model is shown below. The model depicts the stacked and latticed credentialing among the five grant programs. The model could also be viewed as a logic map which depicts how SDECP is supposed to work.



Evaluation Design

The main goal of this program evaluation is to collect information from a variety of sources to inform adjustments to the program and to estimate its overall effectiveness. This goal is being addressed by conducting an implementation analysis as well as an analysis of program results in the form of participant outcomes.

MTI hired the BC Kuhn Evaluation Team in 2014 to conduct the program evaluation of the SDECP program. BC Kuhn conducted the evaluation until March 2016. TIE, Technology and Innovation in Education, was hired in April 2016 to complete the SDECP evaluation. An annual evaluation report was created by BC Kuhn in February 2016. TIE utilized that report as a primary resource in developing this Interim report.

The implementation analysis section of this report focuses on 14 SDECP activities identified in the project work plan. Implementation is assessed using the *Level of Implementation Matrix* listed below. The implementation levels are largely determined through interviews with project leaders as well as reviews of quarterly reports and other program documentation.

Level of Implementation Matrix	
Early Planning	SDECP has made some progress in planning the implementation of the activity. Written plans are in the draft stages.
Full Planning	SDECP has a final written plan of how the activity will be structured (including logistical details).
Partial Implementation	Some activities are in the full planning stage, while others are in the early implementation stage.
Early Implementation	The activity has begun implementation on a pilot basis.
Moderate Implementation	The activity is occurring regularly.
Full Implementation	All activities have been implemented and are occurring regularly with full participation.
Institutionalized	The activity has become adopted by MTI and will continue after funding ends.

The outcomes-only analysis focuses on the TAACCCT program outcomes measures listed below. Student data is collected via Jenzebar, MTI's student information system. In addition, the original evaluator of SDECP (BC Kuhn) promoted the use of a *static-group comparison design* to compare retention and employment rates between students in the SDECP programs of

study to students in non-SDECP programs of study at MTI, to the MTI student body as a whole, and to students enrolled in South Dakota's technical institutes as a whole. These comparisons are included in the overall analysis of participant outcomes.

Participant Outcome Measures

1. Unique Participants Served/Enrollees

2. Total Number of Participants Who Have Completed a Grant-Funded Program of Study

2a. Total Number of Grant-Funded Program of Study Completers Who Are Incumbent Workers

3. Total Number Still Retained in Their Programs of Study (or Other Grant-Funded Programs)

4. Total Number Retained in Other Education Program(s)

5. Total Number of Credit Hours Completed (aggregate across all enrollees)

5a. Total Number of Students Completing Credit Hours

6. Total Number of Earned Credentials (aggregate across all enrollees)

6a. Total Number of Students Earning Certificates - Less Than One Year (aggregate across all enrollees)

6b. Total Number of Students Earning Certificates - More Than One Year (aggregate across all enrollees)

6c. Total Number of Students Earning Degrees (aggregate across all enrollees)

7. Total Number Pursuing Further Education After Program of Study Completion

8. Total Number Employed After Program of Study Completion

9. Total Number Retained in Employment After Program of Study Completion

10. Total Number of Those Employed at Enrollment Who Receive a Wage Increase Post-Enrollment

Evaluation Questions

The following evaluation questions guide the *formative* evaluation of SDECP's implementation. They are written as project-specific questions to address those required by the SGA.

Curriculum Design and Delivery

- How were the PL diploma, PNG diploma, IMT diploma, EUST AAS degree, UT-HCT AAS degree, and UT-PL degree curriculums revised and to what extent were the changes implemented? How were the revised curriculums improved or expanded?
- How were the new curriculums for the EUST transition program for prior electrical skills and the IMT (Maintenance & Controls) AAS degree developed and to what extent were they implemented? How were the curriculums improved or expanded?
- Did SDECP redesign the curriculum for developmental classes in English and math? How was the curriculum improved or expanded?
- What delivery methods were offered (i.e. distance education or traditional classroom)? How did SDECP incorporate innovative instructional technologies into the program (e.g., simulations, simulators)?

Student Recruitment and Prior Learning Assessment

- What policies and procedures did MTI develop and implement to improve its ability to meet the needs of a diverse student population? Did SDECP develop and conduct a marketing campaign to reach a diverse student population? Did SDECP conduct outreach activities facilitate career interest and promoted diversity?
- Did MTI conduct an in-depth assessment of participants' prior learning and experiences to select them into the grant program? If so, what assessment tools and process were used? Were the assessment results useful in determining the appropriate program and course sequence for participants?

Partnerships

- What contributions did each of the partners and/or stakeholders provide towards program design, curriculum development, recruitment, training, placement, program management, leveraging of resources, and/or commitment to program sustainability?

- What factors contributed to partners' involvement or lack of involvement in the program?
- Which contributions from partners were most critical to the success of the grant program?

Additional questions to guide the *summative* evaluation of the project were identified by MTI and are listed below.

- To what extent have the MTI TAACCCT grant activities impacted an increase in the number of grant participants earning A.A.S. degrees, diplomas and national certification in high-skill, high-wage occupations in the Energy sector?
- To what extent have the MTI TAACCCT grant activities impacted a replication of effective methods for designing and delivering instruction?
- To what extent have the MTI TAACCT grant activities impacted improved employment outcomes?
- In what ways were targeted "occupational areas" changed and/or enhanced by the grant's operation?
- To what extent did the project expand institutional capacity?
- Is SDECP sustainable?

Data Collection

This evaluation is utilizing the following data collection strategies to gather evidence in order to inform the implementation and outcomes analysis.

- **Interviews** are being conducted through face-to-face meetings during site visits. All interviews are voluntary. Informal discussions with SDECP project leaders also occur regularly. Interviews with SDECP instructors in the PL and EUST programs were conducted in July 2016. Interviews were conducted with instructors in the CDL program in December 2016. Interview questions can be found in **Appendix B.**

- **Site Visits**. The evaluation team gathers data through direct observations during site visits. Attending advisory council meetings, taking tours of classrooms and the "outdoor lab", and taking the wheel in the grant-funded driving simulator have provided evaluators

first hand experiences and information. Site visits have been conducted in April, July, November, and December of 2016.

- **Surveys** of participants and instructors were administered in May 2016. MTI also administered surveys to all students who experienced the driving simulators as part of coursework to gain their CDL. These surveys were administered in both May and December 2016. No surveys were administered during the first year of the project per DOL guidance and restrictions on implementation of evaluation activities while evaluation plans were being reviewed at the national level. Survey results from years two and three can be found in **Appendix C**. An Evaluation Brief was developed to share the results of the spring surveys. It can be found in **Appendix D**.

- **Documentation**. Evaluators are collecting and reviewing written documents, such as the quarterly and annual performance reports completed and submitted by MTI. A variety of other data sets and reports generated by MTI, the South Dakota Department of Education, the South Dakota Board of Regents, the South Dakota Department of Labor and Regulation are being examined, as well as marketing and curricular materials produced by the SDECP project.

Implementation Findings

Activities and Deliverables

The SDECP project involves 14 Activities and five Deliverables to effectively address and document its four main strategies. Each Activity and Deliverable is listed in the table below with its current status of implementation as assessed by the *Level of Implementation Matrix*.

Level of Implementation Matrix	
Early Planning	SDECP has made some progress in planning the implementation of the activity. Written plans are in the draft stages.
Full Planning	SDECP has a final written plan of how the activity will be structured (including logistical details).
Partial Implementation	Some activities are in the full planning stage, while others are in the early implementation stage.
Early Implementation	The activity has begun implementation on a pilot basis.
Moderate Implementation	The activity is occurring regularly.
Full Implementation	All activities have been implemented and are occurring regularly with full participation.
Institutionalized	The activity has become adopted by MTI and will continue after funding ends.

Strategy 1: Increase the number and diversity of project participants through marketing, recruiting, and outreach efforts.	
Activity	**Status**
Develop and conduct a marketing campaign to include various media and strategies.	Assessed as **Full Implementation**. Brochures, a website, and a TV ad have been developed. Focus is now on the newly developed Gas Technology program.
Develop and conduct outreach programs to facilitate career interest, promote student diversity, and student success.	Assessed as **Moderate Implementation**. There was turnover in the Diversity Coach position in year 2. A Career Expo exposed SDECP to 1,000 participants. More outreach activities expected.
Deliverable	**Status**
Marketing findings, materials, and explanation of effectiveness.	Assessed as **Moderate Implementation**. Brochures garnered positive feedback. Online ads being tracked for usage.
Strategy 2: Develop and deliver an industry-endorsed Energy Careers Pathway Model that provides multiple entry and exit points and stackable credentials for Energy and Utility programs.	
Activity	**Status**
Hire project staff/instructors.	Assessed as **Full Implementation**. Diversity coach hired and other grant work contracted with existing

	staff. A Natural Gas Technology program instructor scheduled to be hired in Spring 2017.
Assist Black Hills Corporation and CEWD in the creation of the South Dakota Energy Consortium.	Assessed as **Full Implementation**. Dakota Energy Workforce Consortium (DEWC) is meeting regularly with MTI staff filling key leadership roles.
Develop/modify Energy Core curriculum and create Maintenance & Controls AAS curriculum.	Assessed as **Full Implementation**. Industrial Maintenance & Controls AAS program launched in August 2015. Power Line program expanded to 100 students. PNG program being transformed to Gas Technology program with industry input.
Implement revised Pathway to Energy Careers curriculum.	Assessed as **Full Implementation**. New GIS mapping program added as second year for AAS programs in addition to the UT and EUST. CDL required for PL and EUST students.
Deliverable	**Status**
Documentation of curriculum and credentials.	Assessed as **Moderate Implementation**. Curriculum changes being documented using World-wide Instructional Design System (WIDS).
Strategy 3: Expand and enhance MTI's capacity for student retention and student services to support a diverse student population.	
Activity	**Status**
Hire grant support staff: Diversity Coordinator/Career Coach, Prior Learning/Credential Coordinator, Instructional Support Specialist, and Technology Specialist.	Assessed as **Full Implementation**. Diversity Coach and Instructional Support Specialist hired. Other positions filled by existing or contracted staff.
Develop and implement policies and procedures to provide improved MTI capabilities to meet the needs of a diverse student population.	Assessed as **Moderate Implementation**. Career Coach Handbook being developed. Student Services merged with Student Success Center. Policy development still needed.
Deliverable	**Status**
Documentation of support services procedures and policies.	Assessed as **Moderate Implementation**. Career Coach and Diversity Handbooks being developed. Efforts continue.
Strategy 4: Expand and enhance MTI's capacity for program improvement and innovative instructional delivery.	
Activity	**Status**
Expand network and net-server capacity to provide needed infrastructure to provide education and training and related activities.	Assessed as **Full Implementation**. Network and infrastructure updated. Bandwidth has been increased and LMS (*MyMTI*) is upgraded.
Purchase trainers and equipment.	Assessed as **Full Implementation**. All purchases have been made.
Review, adopt, or adapt simulations, virtual labs, and instructional technology for promoting improved learning outcomes.	Assessed as **Full Implementation**. Simulations have been added to grant programs' curricula. CDL driving simulator being used for instruction and outreach.
Create a Professional Development center to prepare and provide on-going professional development training and experiences for faculty.	Assessed as **Full Implementation**. PDC is mostly a virtual resource developed as "Center for Instructional Excellence" and accessed through *MyMTI*.
Revise process for assessment of prior learning and experiences and revise developmental math and English classes.	Assessed as **Full Implementation**. Existing practice was reviewed and guidelines for prior learning developed and available to students on MTI website.

Monitor and evaluate MTI's strategies for program improvement and achievement of desired outcomes.	Assessed as **Full Implementation**. Courses reviewed each semester. Advisory boards offer input and feedback. Grant programs evaluated by external evaluators.
Deliverable	**Status**
Documentation of Prior Learning Assessment (PLA) Procedures and practices and developmental education curriculum.	Assessed as **Full Implementation**. Prior learning guidelines are posted on the MTI website at https://www.mitchelltech.edu/admissions/admissions-process/credit-for-prior-learning
Published Interim and Final report.	Assessed as **Moderate Implementation**. Interim report submitted. Evaluation efforts continue.

Evaluation Questions

Curriculum Design and Delivery

How were the PL diploma, PNG diploma, IMT AAS, EUST AAS degree, , and UT-PL degree curriculums revised and to what extent were the changes implemented? How were the revised curriculums improved or expanded?

Curricula for these five grant programs were revised to include a number of simulations to provide a more realistic and hands-on experience for students. In addition, a variety of upgraded tools and equipment were added to the programs to enhance instruction and provide guided practice to students that is realistic and current in terms of industry standards.

- The **PL** program has enhanced the curriculum by adding a boom lift, backhoe loader, pressure digger, and internet based simulations. SD Department of Transportation Flagger certification was also added to the program. To date, eight of the 12 courses in the program have been revised with newly acquired tools, equipment, and materials. The program's total enrollment has been increased from to serve 100 students, partly made possible with the hiring of two additional instructors with grant funds. All students in the program are required to earn their Commercial Drivers' License (CDL). The related coursework has been enhanced with the purchase of two driving simulators with grant funds. PL students are also active in putting up power poles, power lines, and electrical monitoring equipment in MTI's outstanding "outdoor lab".
- Four of the six required courses in the **PNG** program were enhanced with equipment and supplies, including the use of a newly acquired backhoe loader. Due to changes in the Energy industry, the PNG program is being revised with input from industry partners. It

is anticipated that a newly revised program, **Natural Gas Technology**, will be launched in Fall 2017.

- The **EUST** program has received over $400,000 in donated equipment and supplies from its industry partners. Students are helping to construct an onsite electrical substation using these donations. All but three of the 10 required courses in the program have been enhanced by donated and grant-purchased items. From a substation truck to two-way radios to laminated power poles, the program has seen numerous improvements since the launch of the grant. The electrical substation, referred to as the "outdoor lab", includes both overhead and underground transmission lines and has fast become the centerpiece for all SDECP programs.

- A new AAS degree was approved for the **IMT** program in January 2015. A number of Amatrol Learning Systems are now being utilized in coursework for the program. The IMT AAS program was developed utilizing existing MTI classes. The curriculum encompasses aspects of electrical, hydraulics, and mechanical technology that are found in several other programs (Electrical Construction and Maintenance, Wind Turbine Technology, and Heating and Cooling Technology). Applicable classes from on-campus programs were bundled to form an option for IMT AAS that could be offered on the MTI campus. Prior to the creation of this option, only a 9-month diploma option for IMT was available but only on the Yankton satellite campus. Although that program was started in 2012, the ongoing student enrollments have not been sufficient to sustain an off-campus

program and it was discontinued in Yankton following graduation of the final class in May 2016. Two students who started the IMT AAS option on the Mitchell campus during Fall 2016 are still enrolled and expected to complete the IMT AAS in May 2017.

- The **Utilities Technology AAS program** is a combination of other grant funded programs, including the PL and PNG programs. Enhancements to those programs combine to enhance the UT program as a whole. The development of the new Natural Gas Technology (NGT) program creates a new pathway for students in earning their AAS degree in Utilities Technology (UT), as does the GPS/GIS Mapping Technology program, which was initiated as part of MTI's Round 2 TAACCCT grant.

How were the new curriculums for the EUST transition program for prior electrical skills and the IMT (Maintenance & Controls) AAS degree developed and to what extent were they implemented? How were the curriculums improved or expanded?

Additional readings and videos were added to the EUST curriculum in order to give incoming students a stronger background with transmission and distribution within the power grid. Much of the existing EUST curriculum is still in place but the AC/DC course is now also being taught to students in the Wind Turbine Technology program. Ten simulations are now being used in the program whereas none were used prior to the grant. Students are also using new oil testers, purchase with grant funds, as part of the curriculum.

Networking and collaboration between the EUST and SCADA programs have increased. A process is being developed to further assist incoming students with a strong theoretical background in electricity to gain more skills in applying theory to real world situations in the utilities industry.

Did SDECP redesign the curriculum for developmental classes in English and math? How was the curriculum improved or expanded?

An online Math course was developed in the fall of 2014 and included in MTI's learning management systems called *MyMTI.* The newly revised course includes new materials and strategies, as well as contextualized content from the Center for Energy Workforce Development

(CEWD). The English curriculum is currently being reviewed and potential revisions are being explored.

What delivery methods were offered (i.e. distance education or traditional classroom)? How did SDECP incorporate innovative instructional technologies into the program (e.g., simulations, simulators)?

A number of new simulations have been incorporated into coursework within the five grant programs. *EnergyU* is being utilized in the EUST and PL programs. Driving simulators were purchased with grant funds and are being utilized by PL students in order to earn Commercial Driver's Licenses. The "outdoor lab" is being utilized on a daily basis as students create an electrical substation on campus.

During the summer of 2016, PL instructors worked with the U.S. Department of Labor to create a four-year Registered Apprenticeship program. The first year of the program includes the current PL program with some adaptations to meet national standards. Years two through four include additional coursework coupled with an internship to provide on-the-job training (OJT). The apprenticeship will result in Journeyman Certification and a possible AAS degree, if desired. The Registered Apprenticeship option was approved by the SD Board of Education in 2016 as a program expansion of the existing MTI Powerline Program. This BOE approval granted MTI the authority to provide this delivery option just as it has authority to offer other approved education and training programs. US DOL is the actual approving authority of all Registered Apprenticeships and verbal approval of the MTI Line-worker Registered Apprenticeship has

been given by the US DOL State Director of Apprenticeship. Enrollment of the initial cohort of apprentices is expected during summer 2017.

Student Recruitment and Prior Learning Assessment

What policies and procedures did MTI develop and implement to improve its ability to meet the needs of a diverse student population? Did SDECP develop and conduct a marketing campaign to reach a diverse student population? Did SDECP conduct outreach activities facilitate career interest and promoted diversity?

MTI continues to market its Energy programs in diverse ways such as print materials, webpages, and TV commercials. A *South Dakota Energy Career Pathways – Great Jobs in ENERGY* brochure was produced and distributed early in the grant period to help "rebrand" programs in Energy and Utilities by highlighting the advanced technologies in those industries. The brochure can be found in **Appendix E**.

A "Diversity and Success Career Coach" was hired to support and recruit a more diverse student population. A Diversity Club has also been started on campus. Over 100 PL and EUST students attended a presentation by Susan Blaser in November 2016. Ms. Blaser is a power lineman who shared her experiences in the Energy industry. Her presentation helped raise awareness of non-traditional roles in the Energy industry and served to encourage tolerance and respect. Ms. Blaser is now serving as a mentor to the lone female student currently enrolled in the Power Line program. Press coverage of her visit to MTI can be found at https://blogs.mcckc.edu/newsroom/2015/12/01/mcc-bts-blaser-featured-in-npr-story-new-book/#more-5594

Outreach activities to date have included Careers in Energy Week and MyTI days. In addition, the driving simulators for the CDL program are housed in a trailer (shown below) which also serves to market MTI's Energy programs at various events in the region.

Did MTI conduct an in-depth assessment of participants' prior learning and experiences to select them into the grant program? If so, what assessment tools and process were used? Were the assessment results useful in determining the appropriate program and course sequence for participants?

MTI admissions representatives discuss the background, prior learning, and career desires of potential program applicants in order to help place them into a suitable program aligned with the student's goals and abilities. *Accuplacer* or ACT testing is also to determine student readiness for post-secondary classes. Although prior learning is discussed with prospective students, MTI did not have a well-documented process until completion of the *Assessment for Prior Learning* guidelines in the fall of 2016. It is anticipated that this assessment will better equip students, admissions, and student services staff to assist students with the admissions process. The guidelines can be found at https://www.mitchelltech.edu/admissions/admissions-process/credit-for-prior-learning.

Partnerships

What contributions did each of the partners and/or stakeholders provide towards program design, curriculum development, recruitment, training, placement, program management, leveraging of resources, and/or commitment to program sustainability? What factors contributed to partners' involvement or lack of involvement in the program? Which contributions from partners were most critical to the success of the grant program?

Every program at Mitchell Technical Institute includes an advisory board made up of industry representatives. The advisory boards are a valuable resource to program instructors as they strive to keep the curriculum aligned with current industry standards. Most advisory boards meet twice each academic year. An example of an advisory board agenda is included **in Appendix F.**

Along with detailed input regarding skills, tools, and equipment, advisory boards offer donations of old equipment and materials to MTI's energy programs. The EUST program has received over $400,000 in donations for its development of an "outdoor lab" in the form of an on-campus electrical substation. A list of these donations can be found in **Appendix G.**

Industry partners are involved with MTI for a number of reasons. First, many MTI graduates are their future employees and they regularly inform instructors about upcoming job openings. Secondly, some of the MTI instructors are their former employees. Thirdly, MTI's provides custom training to regional companies through their Advanced Technical Education (ATE) program, formerly known as their Corporate Education Program. For example, employees of the Great Western Casualty Company recently received training for Commercial Driver's Licenses using MTI's new driving simulators.

Another local partnership has solidified during the grant period. Dakota Wesleyan University (DWU) is a private four-year institution in Mitchell, SD. MTI and DWU recently signed agreements to allow for shared marketing of programs and improved networking between the institutions. These new agreements will open the door to additional pathways for MTI students who wish to earn Bachelor's degrees. Press coverage of these agreements can be found at http://www.mitchellrepublic.com/news/local/4168275-mti-dwu-join-forces-better-serve-students

Institutional Capacity Building

The TAACCCT grant program has helped Mitchell Technical Institute increase its capacity in numerous ways.

- Student support services have been enhanced to include a student success center, student success coaches, and a Diversity Coach. Much of the progress in this area was initiated by a *Student Success Toolkit* which was developed through a Round 1 TAACCCT grant.
- Due in part to the enhanced student support services and curriculum upgrades in grant funded programs, student retention at MTI is increasing.
- MTI is reaching more remote students and more diverse students. Through the work with a Round 2 TAACCCT grant, MTI developed an award winning *TED Model* (Technical Education at a Distance), which enables students to receive technical training without coming to campus. The TED model increased awareness of MTI's programs across South Dakota, including the state's nine American Indian reservations.
- Some academic departments at MTI are becoming more collaborative and integrated. A sense of unification is present as instructors from different programs work together to create diverse pathways for students. New technologies acquired with grant funds help bring instructors from different departments together to see new possibilities and applications which mirror changes in industry. A Professional Development Center was recently established to support faculty collaboration and professional learning.
- Simulators purchased with grant funds have resulted in coursework which is closely aligned with current industry standards. Simulation coordinators and an enhanced technology infrastructure have positioned MTI to integrate simulations in many of its programs.

Participant Impacts and Outcomes

When determining the extent to which the SDECP project is meeting its outcome measure goals, target numbers for the first two years were compared to the actual numbers reported by MTI on Annual Performance Reports. It should be noted that targets were not established for all of the outcome measures reported. For the outcome measures which have targets, those which ***surpassed*** the targets are highlighted in green on the table below. During both the first and second years of the project, five of the nine targeted outcomes were met. It should be noted that the target for outcome measure #6 is set as an aggregate, whereas the actual numbers are reported by level of certification. Additionally, actual numbers for the employment outcomes #8-10 may increase for year 2 as more data becomes available from the South Dakota Department of Labor and Regulation.

Participant Outcomes	Year 1 Target	Year 1 Actual	Year 2 Target	Year 2 Actual
1. Unique Participants Served/Enrollees	**210**	**195**	**98**	**96**
2. Total Number of Participants Who Have Completed a Grant-Funded Program of Study	**102**	**106**	**81**	**83**
2a. Total Number of Grant-Funded Program of Study Completers Who Are Incumbent Workers		**56**		**35**
3. Total Number Still Retained in Their Programs of Study (or Other Grant-Funded Programs)	**118**	**87**	**96**	**116**
4. Total Number Retained in Other Education Program(s)		**0**		**0**
5. Total Number of Credit Hours Completed (aggregate)		**1541**		**2834**
5a. Total Number of Students Completing Credit Hours	**92**	**112**	**83**	**91**
6. Total Number of Earned Credentials (aggregate)		**158**		**313**
6a. Total Number of Students Earning Certificates - Less Than One Year (aggregate)	**102**	**99**	**81**	**86**
6b. Total Number of Students Earning Certificates - More Than One Year (aggregate)		**0**		**0**
6c. Total Number of Students Earning Degrees (aggregate)		**22**		**17**
7. Total Number Pursuing Further Education After Program of Study Completion	**10**	**21**	**10**	**16**
8. Total Number Employed After Program of Study Completion	**32**	**35**	**30**	**16**
9. Total Number Retained in Employment After Program of Study Completion	**0**	**0**	**31**	**12**
10. Total Number of Those Employed at Enrollment Who Receive a Wage Increase Post-Enrollment	**48**	**36**	**46**	**21**

Outcome measure targets for the *entire thee-year project* were included in the original grant application and approved as part of SDECP's Statement of Work. The table below compares the actual numbers for the first two years of the project to the *total* targeted number. Since the project is now about 66% percent complete, it is worth noting that performance on six of the nine targeted outcomes has reached 66% or more of the targeted number. In fact, outcome measure #7 has already exceeded the targeted number for the entire project. Actual numbers for the employment outcomes #8-10 may increase as more data for Year 2 becomes available from the South Dakota Department of Labor and Regulation, pushing those measures closer to their total targets.

Participant Outcomes	Actual Total Years 1 & 2	Target Total	% of Total Target Achieved
1. Unique Participants Served/Enrollees	**291**	**404**	**72%**
2. Total Number of Participants Who Have Completed a Grant-Funded Programs of Study	**189**	**252**	**75%**
2a. Total Number of Grant-Funded Program of Study Completers Who Are Incumbent Workers	**91**		
3. Total Number Still Retained in Their Programs of Study (or Other Grant-Funded Programs)	**203**	**307**	**66%**
4. Total Number Retained in Other Education Program(s)	**0**		
5. Total Number of Credit Hours Completed (aggregate)	**4375**		
5a. Total Number of Students Completing Credit Hours	**203**	**258**	**79%**
6. Total Number of Earned Credentials (aggregate)	**471**		
6a. Total Number of Students Earning Certificates - Less Than One Year (aggregate)	**185**	**252**	**89%**
6b. Total Number of Students Earning Certificates - More Than One Year (aggregate)	**0**		
6c. Total Number of Students Earning Degrees (aggregate)	**39**		
7. Total Number Pursuing Further Education After Program of Study Completion	**37**	**30**	**123%**
8. Total Number Employed After Program of Study Completion	**51**	**92**	**55%**
9. Total Number Retained in Employment After Program of Study Completion	**12**	**86**	**14%**
10. Total Number of Those Employed at Enrollment Who Receive a Wage Increase Post-Enrollment	**57**	**146**	**39%**

Static-Comparison Design

A static-comparison design was included in the original evaluation plan for SDECP as an additional method for estimating the impact of the project. The design called for "comparing retention and employment outcomes of SDECP participants with non-SDECP students, MTI students as a whole, and SD Technical Institute students as a whole".

The table below compares **retention rates** for those groups using available data from the first and second years of the project. Retention rates in the five SDECP programs, as defined as the percentage of students graduated or retained, are exceeding MTI's average retention rate as well as the retention rate in South Dakota Technical Institutes as a whole.

Retention Rates of SDECP Program Students at Mitchell Technical Institute		
	2014-15	**2015-16**
Power Line Construction and Maintenance (PL)	94%	98%
Propane and Natural Gas Technologies (NGT)	91%	93%
Electrical Utilities and Substation Technology (EUST)	89%	100%
Utilities Technology (UT)	100%	82%
Industrial Maintenance Technology (IMT)	75%	86%
SDECP Students Average	93%	95%
Non-SDECP Students Average	78%	79%
Mitchell Technical Institute Average (all programs)	80%	81%
South Dakota Technical Institutes Average (all programs)	77%	77%

Source: South Dakota Department of Education

The table below compares **employment rates** for those groups using available data. Data for 2014-15 shows that the employment rates for students graduating from an SDECP program are similar to MTI's average for all programs. The SDECP employment rate is significantly higher than the average rate for all program at South Dakota's Technical Institutes. Employment data for the second year of the project, 2015-2016 is not yet available. Although more years of data will be added, it appears currently that SDECP programs are meeting the third goal of the TAACCCT program, that of "improving employment outcomes of participants".

Employment Rates of SDECP Program Graduates at Mitchell Technical Institute		
	2014-15	**2015-16**
Power Line Construction and Maintenance (PL)	100%	Not yet available
Propane and Natural Gas Technologies (PNG)	100%	Not yet available
Electrical Utilities and Substation Technology (EUST)	100%	Not yet available
Utilities Technology (UT)	92%	Not yet available
Industrial Maintenance Technology (IMT)	100%	Not yet available
MTI SDECP Students Average (programs above)	98%	Not yet available
MTI Non-SDECP Students Average (all other programs)	99%	Not yet available
Mitchell Technical Institute Average (all programs)	99%	Not yet available
South Dakota Technical Institutes Average (all programs)	82%	Not yet available

Source: South Dakota Department of Education

TAACCCT Goal 1

The first goal of the TAACCCT program challenges grant recipients to ***increase the number of adults earning certificates, degrees, diplomas, and nationally recognized certificates in two years.*** The table below displays the number and percentage of adults earning certifications in the five grant programs during the *three years prior* to the launch of the SDECP project in October 2014. Also shown are the number of adults earning certifications in the five grant programs during the first two years *after* the start of the SDECP project.

This comparison shows mixed results. Overall *graduation rates* for the five SDECP programs have increased since the beginning of the grant period. As well, the PL program has increased the *number* of adults earning certifications since the SDECP project began. Data for the other four programs is inconclusive at this time, as most are currently graduating a similar *number* of adults to the number graduating prior to the SDECP project. Updated data for the third year of the project, and corresponding analysis, will be included in the final evaluation report.

Number of Graduates/Graduation Rates (by year student entered program)					
	2011	2012	2013	2014	2015
Power Line Construction and Maintenance	59 88%	66 93%	71 95%	65 94%	66 94%
Propane and Natural Gas Technologies	20 80%	18 75%	21 91%	16 89%	6 86%
Electrical Utilities and Substation Technology	13 93%	N/A	9 90%	7 100%	8 100%
Utilities Technology	14 93%	25 96%	13 100%	11 100%	9 82%
Industrial Maintenance Technology	3 38%	8 89%	3 60%	9 100%	3 75%
SDECP Students Total	109 85%	117 90%	117 93%	108 95%	92 92%
Mitchell Technical Institute Non-SDECP Students	277 70%	310 69%	308 64%	236* 62%	16* 8%
Mitchell Technical Institute All Students Total	386 74%	427 73%	425 71%	344* 69%	108* 35%

Source: Mitchell Technical Institute student management system (Marla Smith, analyst)

*Most of MTI's non-SDECP programs are two-year associate degree programs. The number of graduates and the graduation rate for 2014 and especially 2015 cohorts is incomplete at this point in time.

Conclusion

Findings

1. The SDECP project is making excellent progress with implementation and achievement of outcome goals. Most activities are at full implementation and most outcomes are exceeding target goals.
2. Numerous enhancements to the five grant programs have been made possible with grant funding and donations.
3. Survey results show that the driving simulators are more efficiently and more safely helping students learn to drive trucks. Students see strong value in the simulators, but find them somewhat less than realistic.
4. Industry support and involvement with MTI's energy programs is strong, resourceful, and ongoing.
5. Students are involved in all aspects of constructing the electrical substation known as the "outdoor lab". 100% of students surveyed reported that the outdoor lab enhances their learning.

Recommendations

1. Prioritize outreach activities during the remainder of the grant to more fully address SDECP's first strategy, increase the number and diversity of project participants through marketing, recruiting, and outreach efforts.
2. Consult with the CDL instructors to further explore the perceptions students have about the driving simulators.
3. Revisit the SD Energy Careers Pathway Model and update to reflect recent efforts and changes to the pathways.
4. Engage in discussions about the sustainability of the grant's four main strategies.

Appendix A

Power Line Construction & Maintenance

- Regionally unique program—the only power line program in South Dakota
- Indoor energy training facility incorporating overhead, underground and other utilities
- Excellent reputation in the utilities industry
- High starting salaries
- Great job opportunities

JOB PLACEMENT RATE: 100%
TUITION/FEES: $10,193

Book and tool costs extra.

For more information about our graduation rates, the median debt of students who completed the program, and other important information, please visit our website at http://www.mitchelltech.edu/futurestudents/gainfulemployment/.

Mitchell Technical Institute
800-684-1969 • mitchelltech.edu

Ranked in the top 150 of America's two-year colleges by the Aspen Institute.

Award: One-Year Diploma

First Semester			Semester Credits
PL	111	Characteristics of DC/AC	3
PL	141	Power Grid Design	3
PL	150	Field Training I	2
PL	151	Construction of Underground Lines	2
PL	152	Construction of Overhead Lines	2
PL	171	Utility Safety I	2
PAT	100	Intro to GPS Technologies	1
CPR	100	First Aid, CPR & AED	0.5
OSHA	101	OSHA 10 Training - Construction	1
SSS	100	Student Success	1
		English Elective	3
			20.5

Second Semester			Semester Credits
PL	120	Transformer Connections	3
PL	143	Power Grid Design II	3
PL	154	Maintenance of Underground Lines	2
PL	155	Maintenance of Overhead Lines	2
PL	156	Field Training II	2
PL	172	Utility Safety II	2
TRAN	100	Industrial Transportation/CDL	1
CIS	105	Complete Computer Concepts	3
		Math Elective	3
			21

Total Credits Required to Graduate: 41.5

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Basic Electricity / Math / Safety / Print Reading
Use of Hand and Power Tools

Mitchell Technical Institute

1800 E. Spruce St., Mitchell, SD 57301
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Award: One-Year Diploma

First Semester			Semester Credits
NG	100	Electrical Circuits & Testing	2
NG	102	Gas Operations & Maintenance	5
NG	110	Gas Operations & Maintenance Lab	4
PTS	100	Intro to GIS Technologies	2
TRAN	100	Industrial Transportation/CDL	1
CIS	105	Complete Computer Concepts	3
SOC	110	Industrial Relations	3
SSS	100	Student Success	1
			21

Second Semester			Semester Credits
NG	101	Gas Appliance Service and Controls	3
NG	103	Gas Installation Lab	5
NG	105	Measurement and Control	5
CPR	100	First Aid, CPR & AED	0.5
OSHA	100	OSHA 10 Training	1
		English Elective	3
		Math Elective	3
			20.5

Total Credits Required to Graduate: 41.5

Mitchell Technical Institute

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NEW! Natural Gas Technology Program

MTI

Mitchell Technical Institute

Emphasizes skills needed to install, maintain, operate and repair gas distribution systems

The **Natural Gas Technology** program will teach you the skills needed to install, maintain, operate and repair gas distribution systems and equipment for residential, commercial and industrial customers. As infrastructure ages and the need for gas services increases, companies are looking to hire now!

After just one year, you will find a wide range of job options with starting **annual salaries as high as $55,000**. Graduates may find employment with public utilities or municipalities to install and maintain gas service, or in the construction industry which contracts with utilities for installation and maintenance.

For information about this exciting **NEW** program or to apply please contact:

MTI Admissions Office
800-684-1969 • 605-995-3025
MTI.Admissions@mitchelltech.edu

Apply Online at:
www.mitchelltech.edu

Mitchell Technical Institute
1800 East Spruce Street
Mitchell, SD 57301


MTI
The best jobs start here!
Industrial Maintenance Technology
• Broad curriculum covering service and maintenance skills for large facilities
• Classes in areas like electricity, heating and cooling, hydraulics, welding, electronics and more
• AAS degree or one-year diploma option
• OSHA 10 certification
• Great job opportunities
JOB PLACEMENT RATE: 100%
TUITION/FEES: $7,447*
(*For one-year diploma)
Book and tool costs extra.
For more information about our graduation rates, the median debt of students who completed the program, and other important information, please visit our website at http://www.mitchelltech.edu/futurestudents/gainfulemployment/.
MTI
Mitchell Technical Institute
800-684-1969 • mitchelltech.edu

Award: One-Year Diploma or AAS Degree

First Semester			Semester Credits
IMT	101	Electrical Fundamentals & Lab	6
IMT	102	Basic Mechanical Drives	3
IMT	103	Basic Hydraulics	3
IMT	104	Welding & Metal Work	1.5
SSS	100	Student Success	1
		Math Elective	3
			17.5

Second Semester			Semester Credits
IMT	105	Intro to Industrial Motor Controls	3
IMT	106	Programmable Logic Controls	3
IMT	107	Heating & Cooling Concepts & Lab	3
IMT	108	Facilities Operation & Maintenance	3
CIS	105	Complete Computer Concepts	3
OSHA	100	OSHA 10 Training	1
		English Elective	3
			19

AAS Degree ONLY

Electrical Emphasis

Third Semester			Semester Credits
ECM	252	Industrial Controls	3
ECM	255	Industrial Controls Lab	1.5
IC	104	Industrial Wiring	2
ECM	251	Industrial Wiring Lab	4
ECON	220	Business Economics	3
		Behavioral Science Elective	3
			16.5

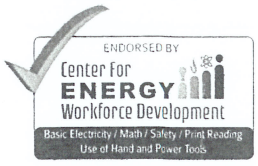
Fourth Semester			Semester Credits
ECM	253	Advanced Control Systems	2.5
ECM	257	Advance Control Lab	2
SD	204	Programmable Automation Controllers	3.5
ECM	244	VFD/Motor Drives	1
EC	167	IT Essentials	3
		Social Science Elective	3
			15

Heating & Cooling Emphasis

Third Semester			Semester Credits
HV	111	Heating Fundamentals	3
HV	121	AC/Refrigeration Fundamentals	4
HV	151	AC/Heating/Refrigeration Lab	4
ECON	220	Business Economics	3
		Behavioral Science Elective	3
			17

Fourth Semester			Semester Credits
HV	132	Heating & Refrigeration Theory	4
HV	142	HV Controls and Heat Pumps	3
HV	152	AC/Heating/Refrigeration Lab II	4
SD	204	Programmable Automation Controllers	3.5
		Social Science Elective	3
			17.5

Total Credits Required to Graduate: 36.5 (One-Year Diploma)
Total Credits Required to Graduate: 68 (AAS)



Electrical Utilities & Substation Technology

- South Dakota's only substation program
- Install, inspect, test, repair and maintain electrical equipment in substations and other 'smart' equipment on the power grid
- Substation lab and equipment located conveniently on campus
- Program open to registered Journeymen or graduates of a power line program
- Great job opportunities
- No difference between in-state, out-of-state tuition rates
- High placement rate

TUITION/FEES: $7,562
Book and tool costs extra.

Mitchell Technical Institute
800-684-1969 • mitchelltech.edu

Ranked in the top 150 of America's two-year colleges by the Aspen Institute.

Award: AAS Degree

First Semester			Semester Credits
EUST	110	Intro to Basic Motor Controls	2
EUST	114	Substation Operations Lab I	4
EUST	120	Substation Operations I	3
EUST	132	Schematic Reading	2
EUST	145	Alternating Current Circuits	2
EUST	150	Substation Safety I	1
		Behavioral Science Elective	3
			17

Second Semester			Semester Credits
EUST	115	Substation Operations Lab II	4
EUST	121	Substation Operations II	3
EUST	130	Intro to Smart Grid & Metering	2
EUST	131	Fiber Optics for Substations	2
EUST	142	Substation Communications Technology	2
EUST	151	Substation Safety II	1
		Social Science Elective	3
			17

Total Credits Required to Graduate: 50 (AAS)

The student seeking an AAS degree must complete:

CIS	105	Complete Computer Concepts	3
SSS	100	Student Success	1
		English Elective	3
		Math Elective	3
		Behavioral Science Elective	3
		Social Science Elective	3
			16

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Use of Hand and Power Tools

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Utilities Technology/ GPS Mapping

- Combines two popular programs in demand by energy sector employers
- Learn the best of Power Line skills and gain valuable hands-on experience
- Complete an additional year of GPS Mapping Technology and learn to use technology to aid with locating, surveying and siting for energy systems construction
- Workers with both skill sets are in high demand
- High starting salaries
- Excellent job opportunities

TUITION/FEES/LAPTOP: $18,109

Book and tool costs extra.

Mitchell Technical Institute
800-684-1969 • mitchelltech.edu

Ranked in the top 150 of America's two-year colleges by the Aspen Institute.

PL Curriculum

First Semester			Semester Credits
PL	111	Characteristics of DC/AC	3
PL	141	Power Grid Design	3
PL	150	Field Training I	2
PL	151	Construction of Underground Lines	2
PL	152	Construction of Overhead Lines	2
PL	171	Utility Safety I	2

Second Semester			Semester Credits
PL	120	Transformer Connections	3
PL	143	Power Grid Design II	3
PL	154	Maintenance of Underground Lines	2
PL	155	Maintenance of Overhead Lines	2
PL	156	Field Training II	2
PL	172	Utility Safety II	2

In addition to the technical courses required in each program, the student seeking an AAS degree must also complete:

TRAN	100	Industrial Transportation/CDL	1
OSHA	101	OSHA 10 Training - Construction	1
CPR	100	First Aid, CPR & AED	0.5
SOC	110	Industrial Relations	3
CIS	105	Complete Computer Concepts	3
SSS	100	Student Success	1
		English Elective	3
		Math Elective	3
		Behavioral Science Elective	3

GPS/GIS Mapping Technology Curriculum

First Semester			Semester Credits
MAP	101	Introduction to GIS	4
MAP	105	GPS Data Collection & Management	4
MAP	110	CAD I	2

Second Semester			Semester Credits
MAP	120	CAD II	2
MAP	121	Cloud Based BPS/GIS Apps	4
MAP	125	GIS Problems & Analysis	4
MAP	128	Remote Sensing	3
BUS	216	Spreadsheet Concepts & Applications	3

Total Credits Required to Graduate: 72.5

Mitchell Technical Institute

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Appendix B

MTI – Round 4 SDECP
Instructor Interviews
July 11, 2016

Introductions and Purpose

1. At this point in the project, what is going well from your perspective? What are your accomplishments with the project? What are your current challenges?
2. What kinds of certifications are involved with the program? Which are "stackable and/or latticed"?

Curriculum Design and Delivery

3. How was the curriculum for this particular program selected, used, and/or created?
4. How is the program being improved or expanded using TAACCCT grant funds?
5. What delivery methods are utilized in the program?
6. In what ways, if any, is the program "competency based"?
7. In what ways, if any, does the program utilize the simulation lab(s) at your school?
8. If what ways, if any, were the curriculum for developmental classes in English and math redesigned as part of the project ?

Student Recruitment and Assessment

9. How is the program being marketed to students? Did SDECP develop and conduct a marketing campaign to reach a *diverse* student population? Did SDECP conduct outreach activities facilitate career interest and promoted diversity?
10. How are students being selected for the program? Did MTI conduct an in-depth assessment of participants' prior learning and experiences to select them into the grant program? If so, what assessment tools and process were used? Were the assessment results useful in determining the appropriate program and course sequence for participants?
11. What support services and other services are offered to students in the program?

Partnerships

12. What kinds of partnerships, if any, help support the program?
13. What opportunities, if any, have been created for employer and student interaction so far? How successful are those efforts? What challenges remain?

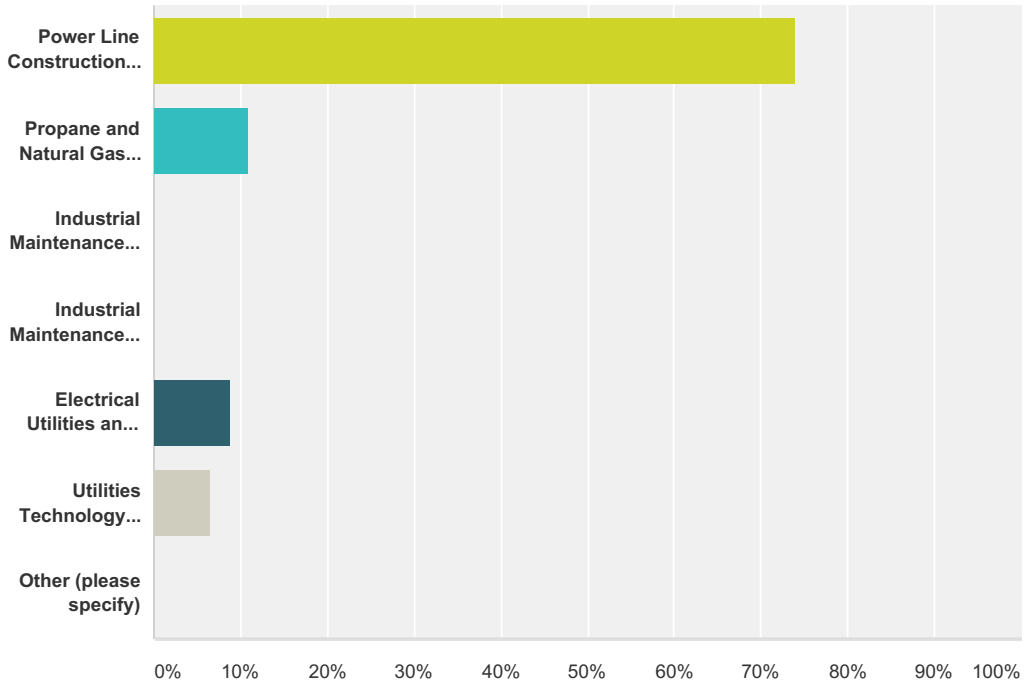
Other

14. What other information would you like to share about the project at your school?
15. What other kinds of information would you like to see collected about the project?

Appendix C

Q1 In which MTI program are you currently enrolled?

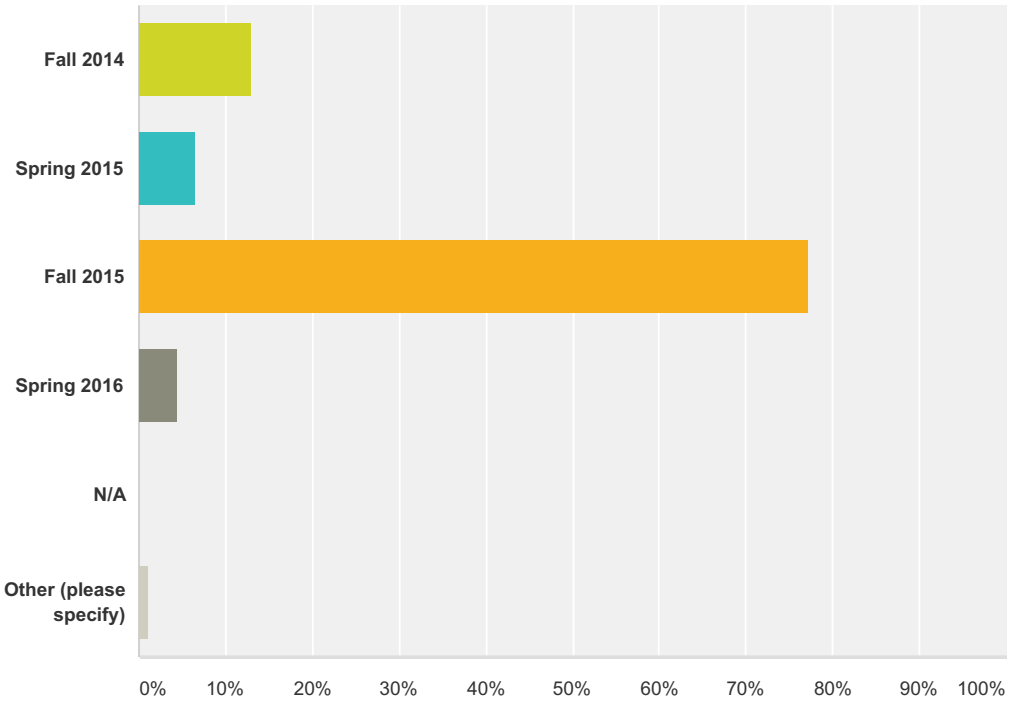
Answered: 92 Skipped: 0



Answer Choices	Responses	
Power Line Construction and Maintenance (Diploma)	**73.91%**	68
Propane and Natural Gas Technologies (Diploma)	**10.87%**	10
Industrial Maintenance Technologies (Diploma)	**0.00%**	0
Industrial Maintenance Technologies (AAS)	**0.00%**	0
Electrical Utilities and Substation Technology (AAS)	**8.70%**	8
Utilities Technology (AAS)	**6.52%**	6
Other (please specify)	**0.00%**	0
Total Respondents: 92		

Q2 In which semester did you enroll in that program?

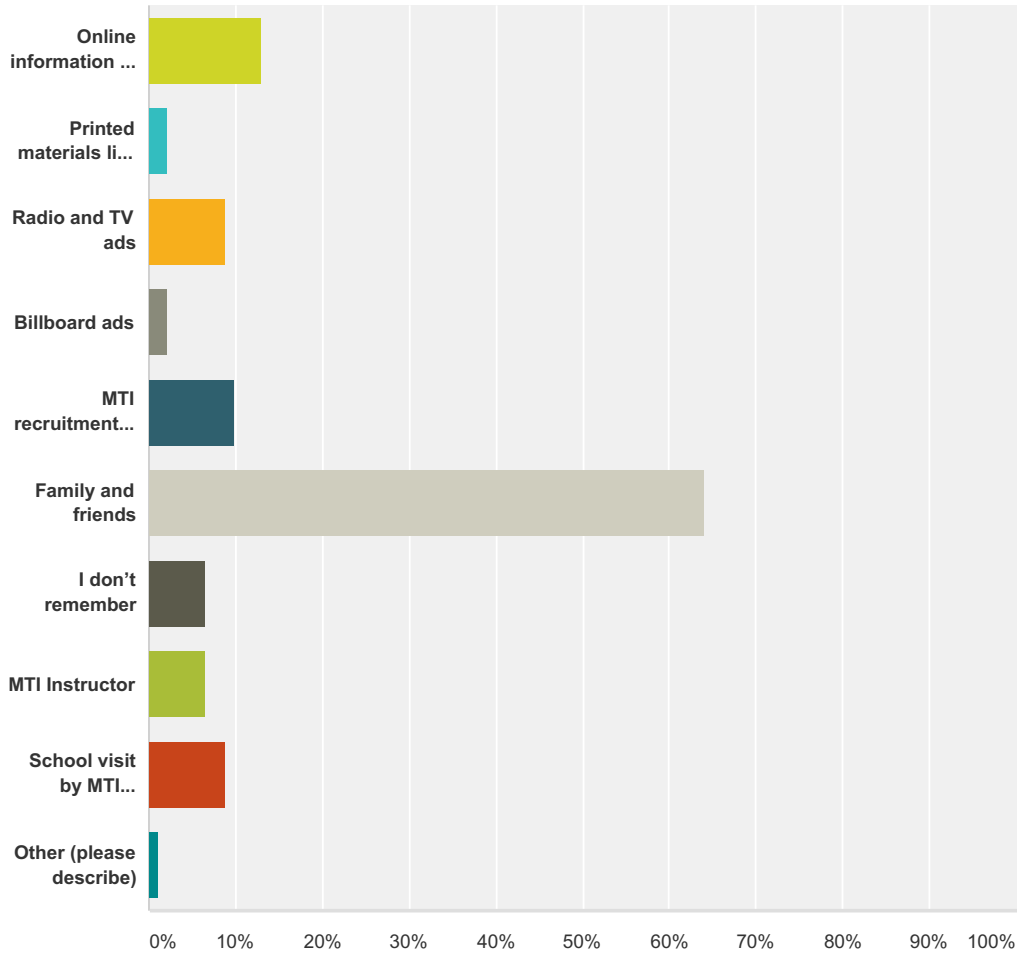
Answered: 92 Skipped: 0



Answer Choices	Responses	
Fall 2014	**13.04%**	12
Spring 2015	**6.52%**	6
Fall 2015	**77.17%**	71
Spring 2016	**4.35%**	4
N/A	**0.00%**	0
Other (please specify)	**1.09%**	1
Total Respondents: 92		

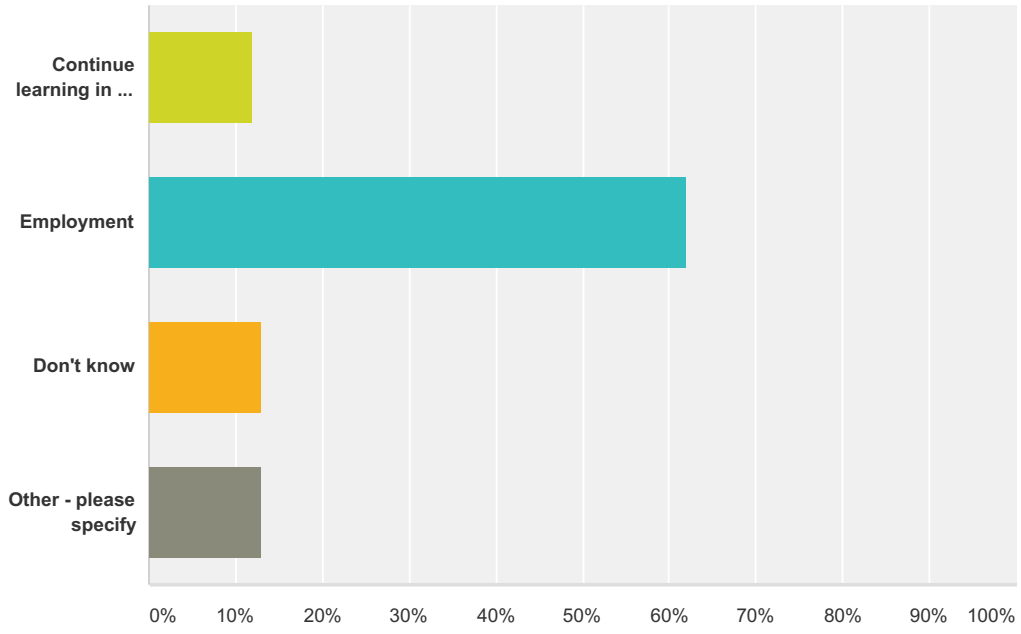
Q3 How did you hear about the program at MTI? (check all that apply)

Answered: 92 Skipped: 0

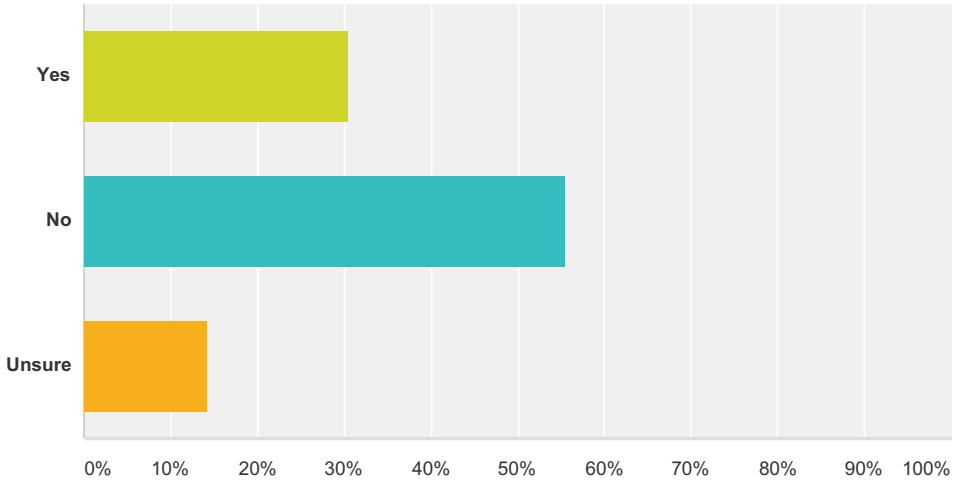


Answer Choices	Responses	
Online information and advertisements	**13.04%**	12
Printed materials like program flyers and advertisements	**2.17%**	2
Radio and TV ads	**8.70%**	8
Billboard ads	**2.17%**	2
MTI recruitment events like camps, school tours, energy trailer, etc.	**9.78%**	9
Family and friends	**64.13%**	59
I don't remember	**6.52%**	6
MTI Instructor	**6.52%**	6
School visit by MTI representative	**8.70%**	8
Other (please describe)	**1.09%**	1

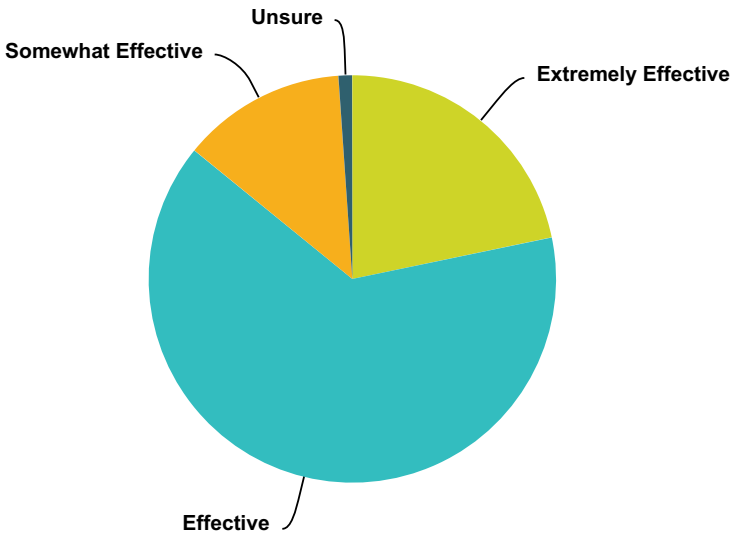
Total Respondents: 92	



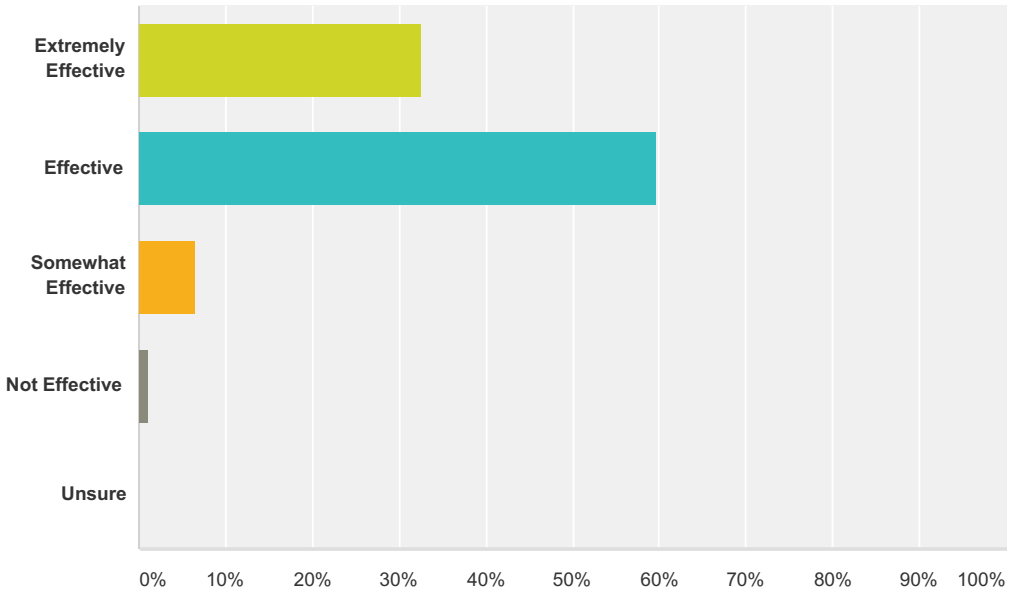
Answer Choices	Responses
Continue learning in a related or advanced program at MTI	
Employment	
Don't know	
Other - please specify	



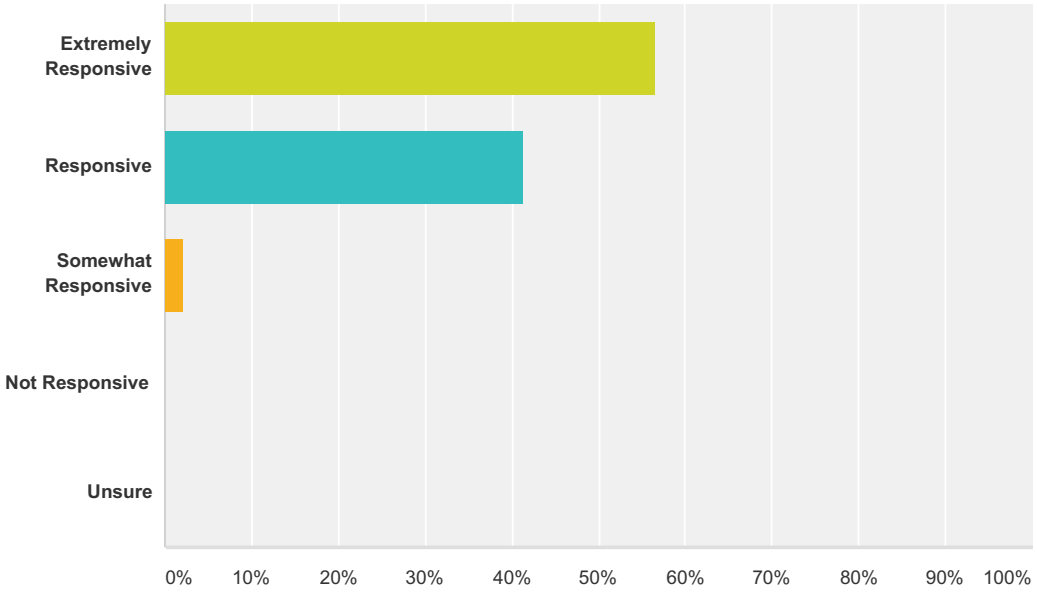
Answer Choices	Responses
Yes	
No	
Unsure	



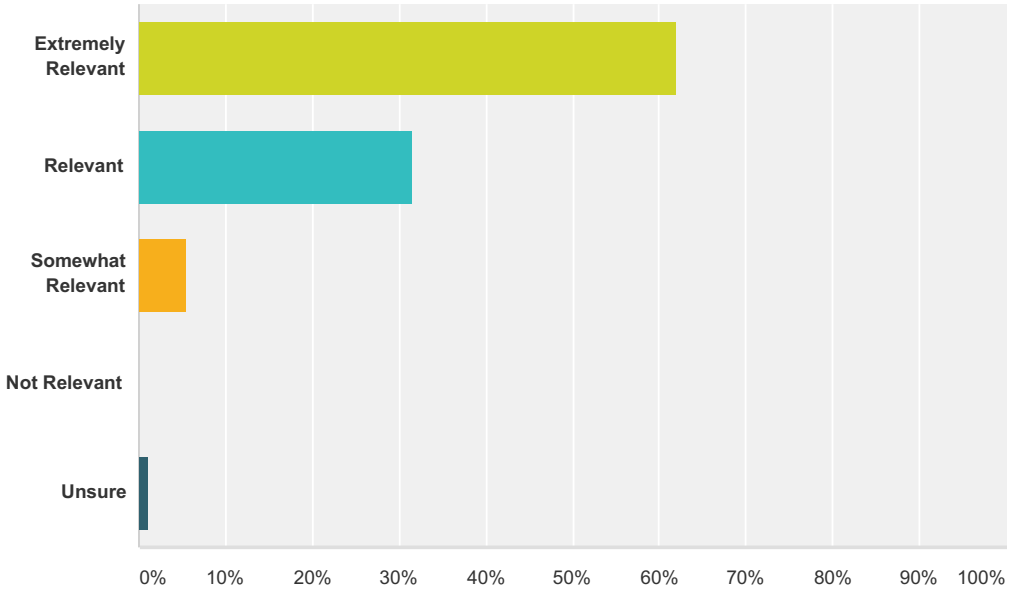
Answer Choices	Responses
Extremely Effective	
Effective	
Somewhat Effective	
Not Effective	
Unsure	



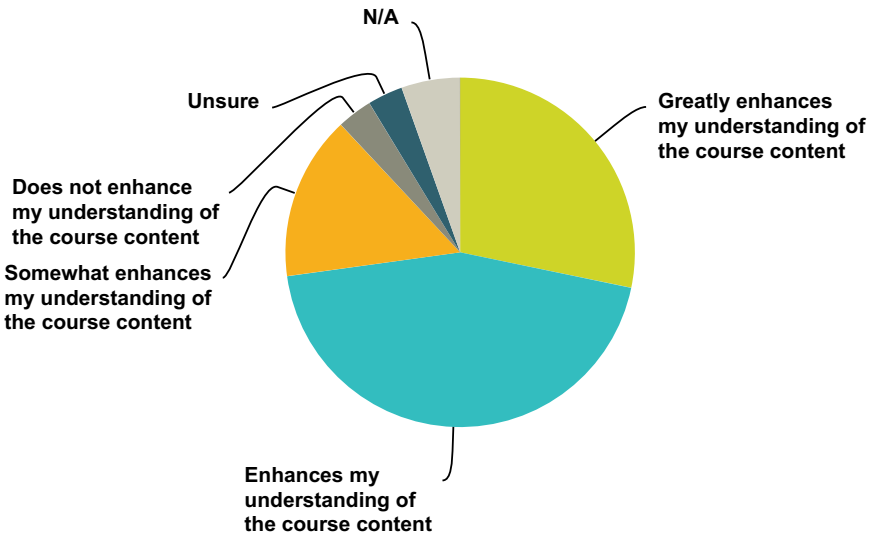
Answer Choices	Responses
Extremely Effective	
Effective	
Somewhat Effective	
Not Effective	
Unsure	



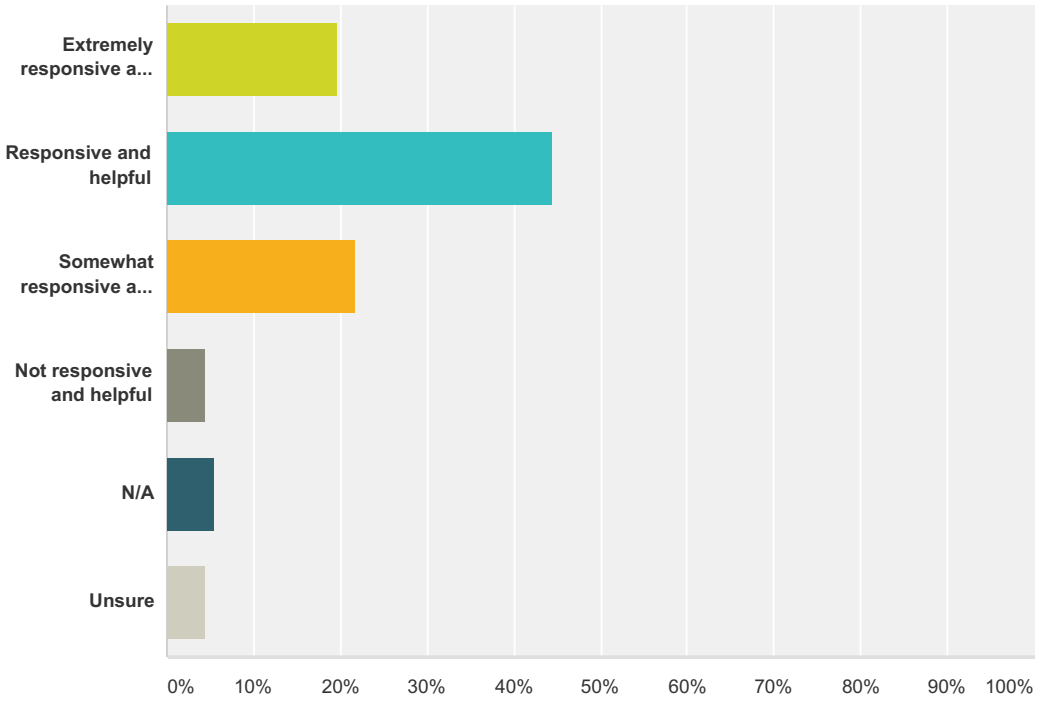
Answer Choices	Responses
Extremely Responsive	
Responsive	
Somewhat Responsive	
Not Responsive	
Unsure	



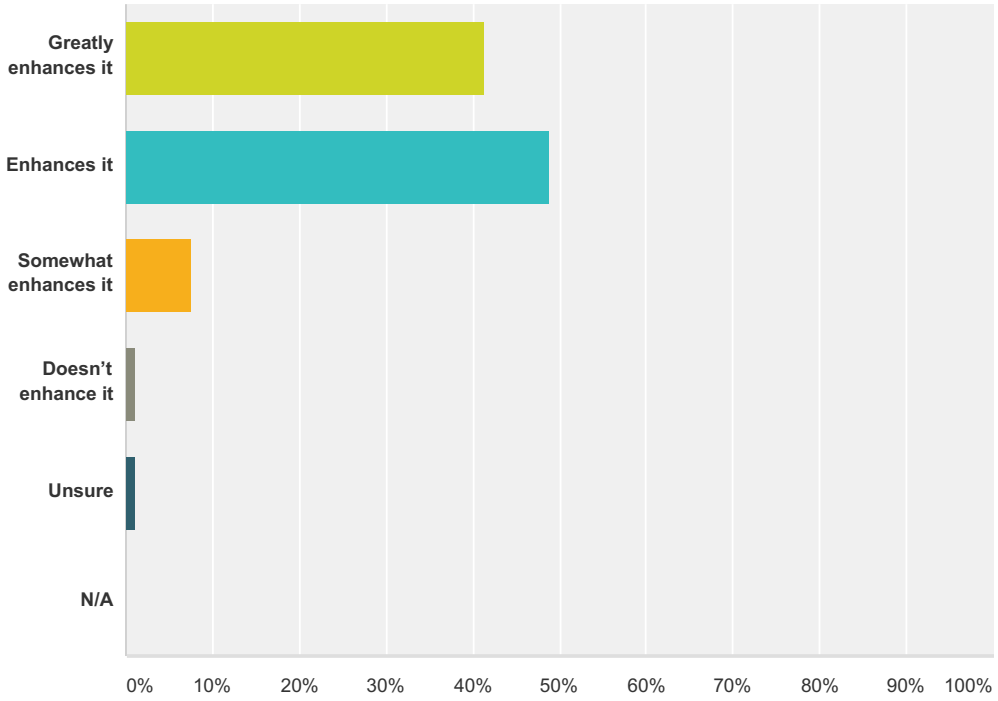
Answer Choices	Responses
Extremely Relevant	
Relevant	
Somewhat Relevant	
Not Relevant	
Unsure	



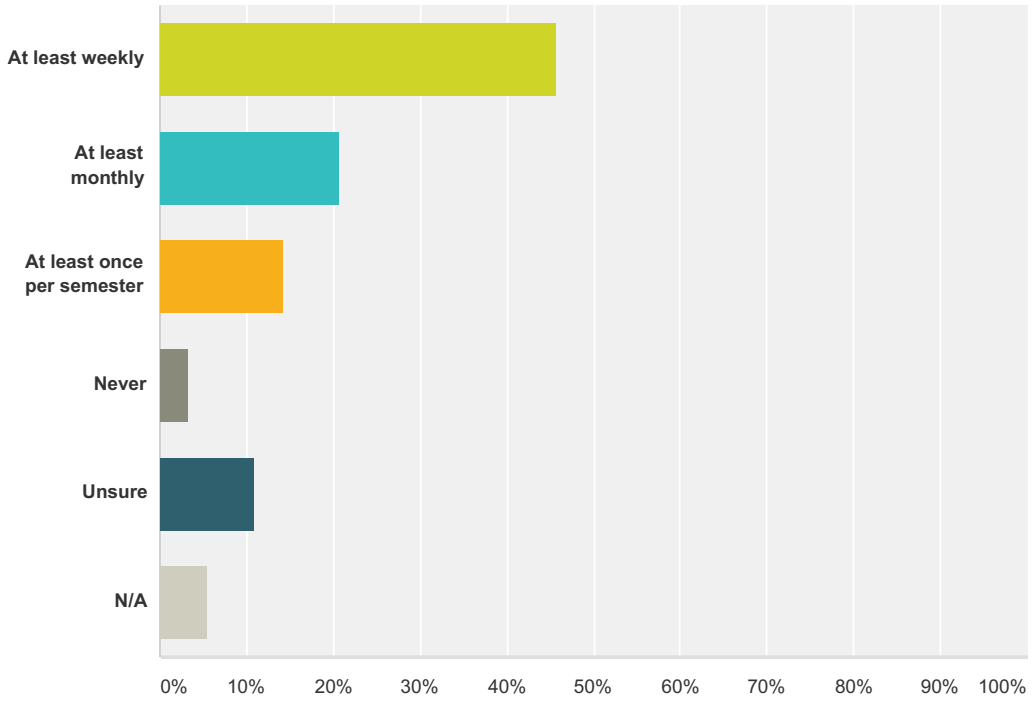
Answer Choices	Responses
Greatly enhances my understanding of the course content	
Enhances my understanding of the course content	
Somewhat enhances my understanding of the course content	
Does not enhance my understanding of the course content	
Unsure	
N/A	
Other (please specify)	



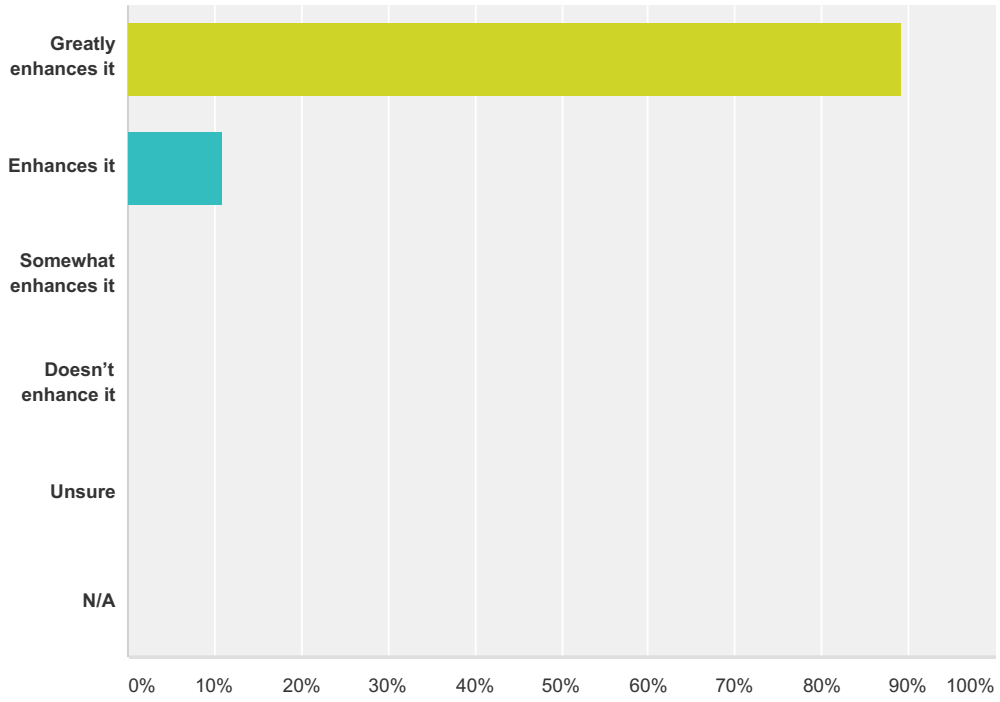
Answer Choices	Responses
Extremely responsive and helpful	
Responsive and helpful	
Somewhat responsive and helpful	
Not responsive and helpful	
N/A	
Unsure	



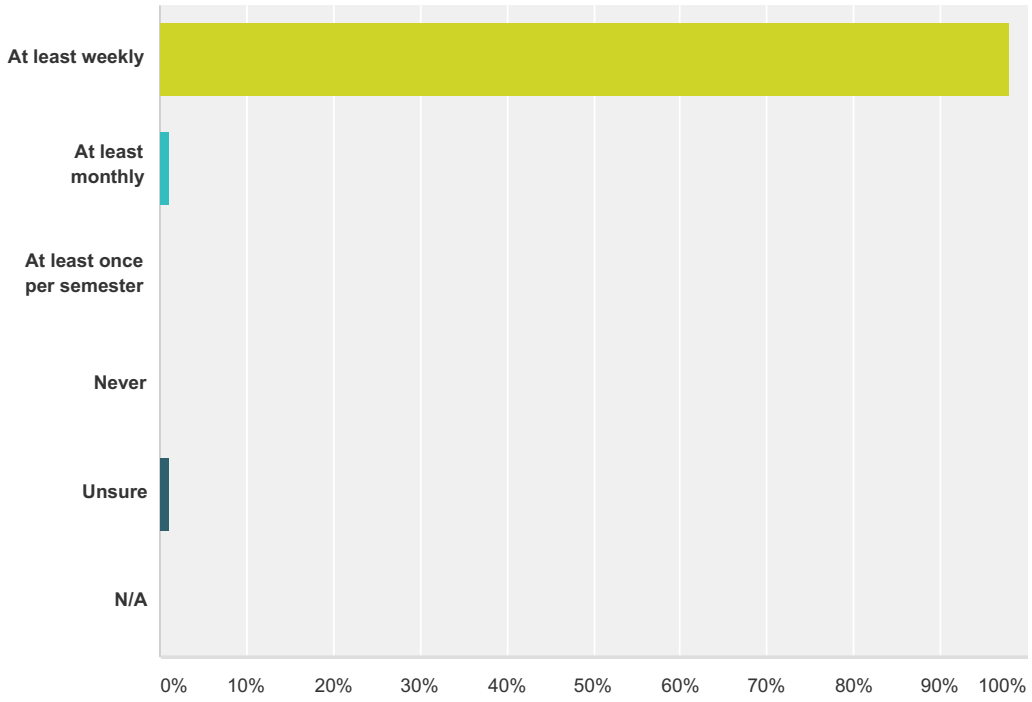
Answer Choices	Responses
Greatly enhances it	
Enhances it	
Somewhat enhances it	
Doesn't enhance it	
Unsure	
N/A	



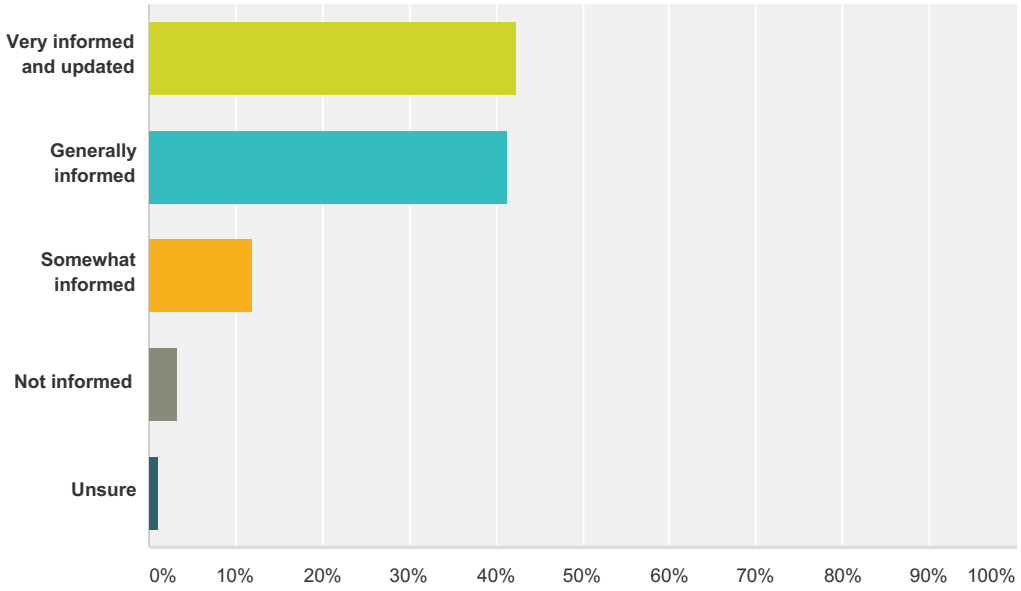
Answer Choices	Responses
At least weekly	
At least monthly	
At least once per semester	
Never	
Unsure	
N/A	



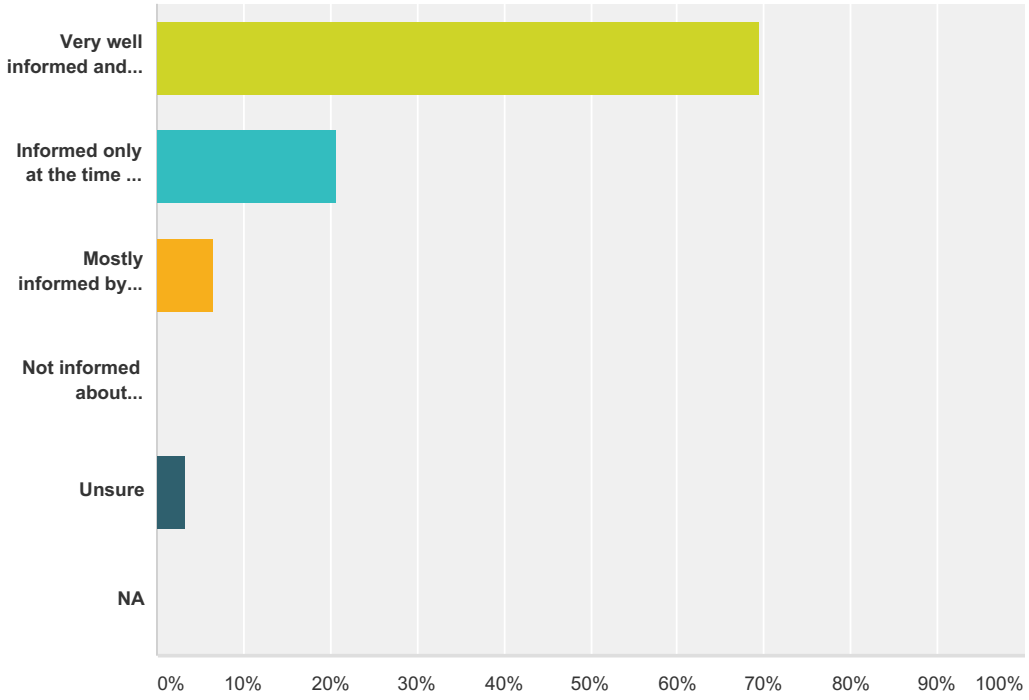
Answer Choices	Responses
Greatly enhances it	
Enhances it	
Somewhat enhances it	
Doesn't enhance it	
Unsure	
N/A	



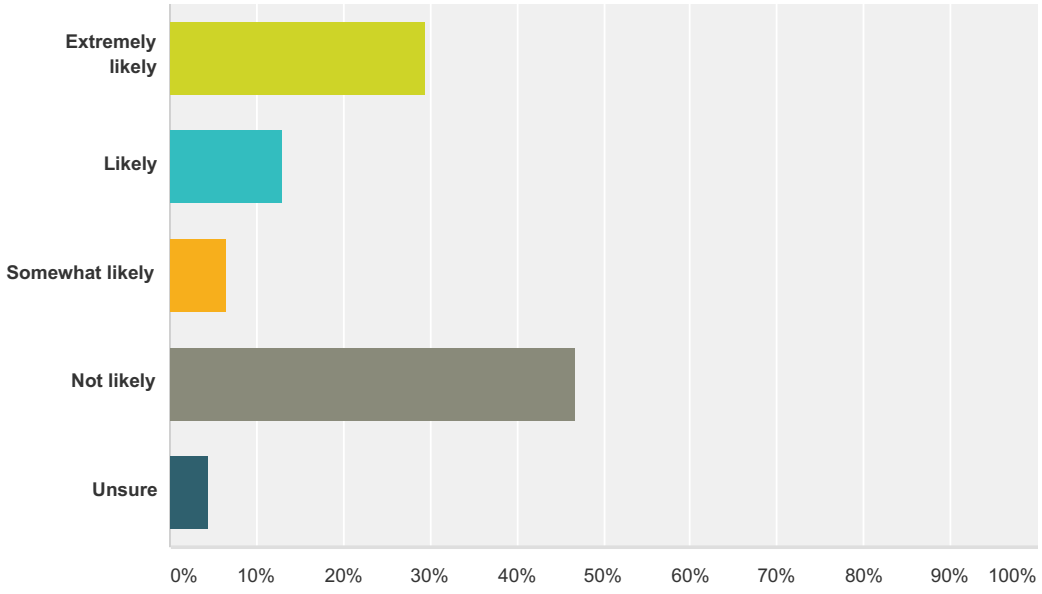
Answer Choices	Responses
At least weekly	
At least monthly	
At least once per semester	
Never	
Unsure	
N/A	



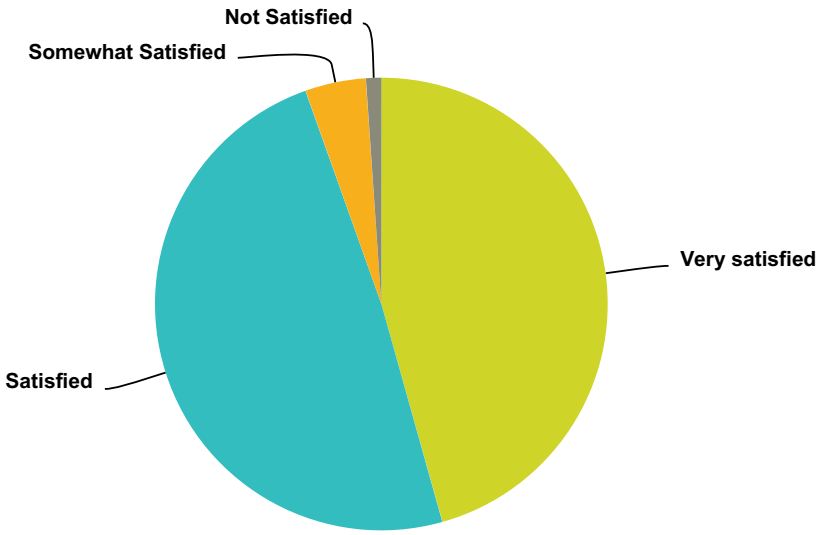
Answer Choices	Responses
Very informed and updated	
Generally informed	
Somewhat informed	
Not informed	
Unsure	



Answer Choices	Responses
Very well informed and updated	
Informed only at the time I registered	
Mostly informed by other students after I enrolled	
Not informed about additional program options	
Unsure	
NA	



Answer Choices	Responses
Extremely likely	
Likely	
Somewhat likely	
Not likely	
Unsure	



Answer Choices	Responses
Very satisfied	
Satisfied	
Somewhat Satisfied	
Not Satisfied	
Unsure	

Q21 Which parts or aspects of your program contribute most to your learning?

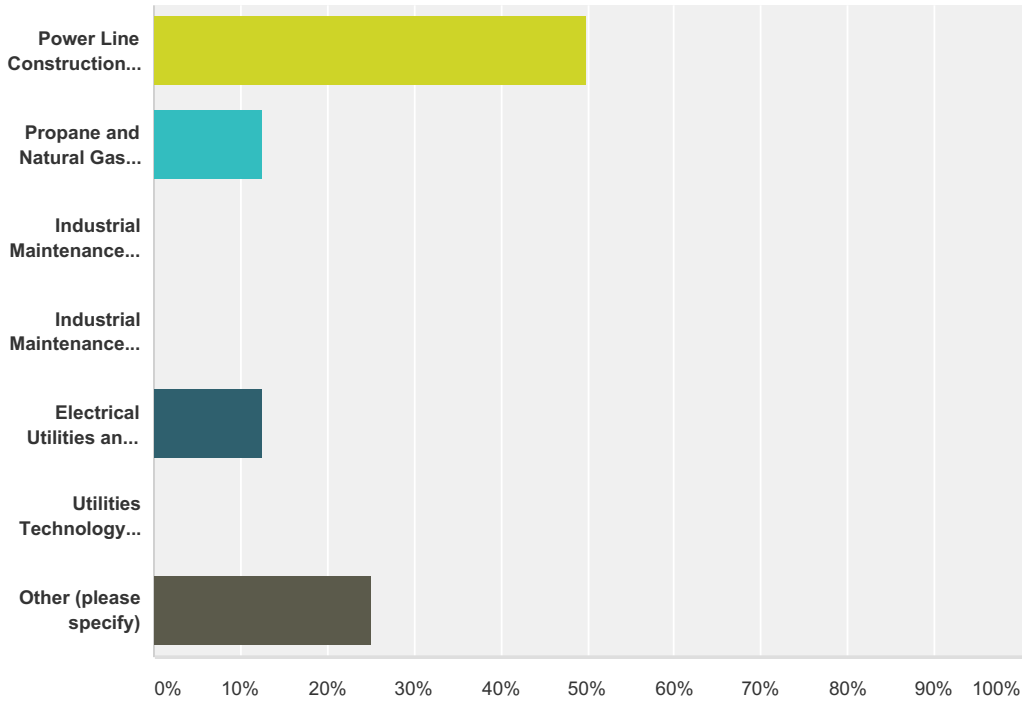
Answered: 88 Skipped: 4

Q22 Please provide any additional comments or suggestions you may have about how your program could be improved.

Answered: 47 Skipped: 45

Q1 For which program are you currently teaching?

Answered: 8 Skipped: 0

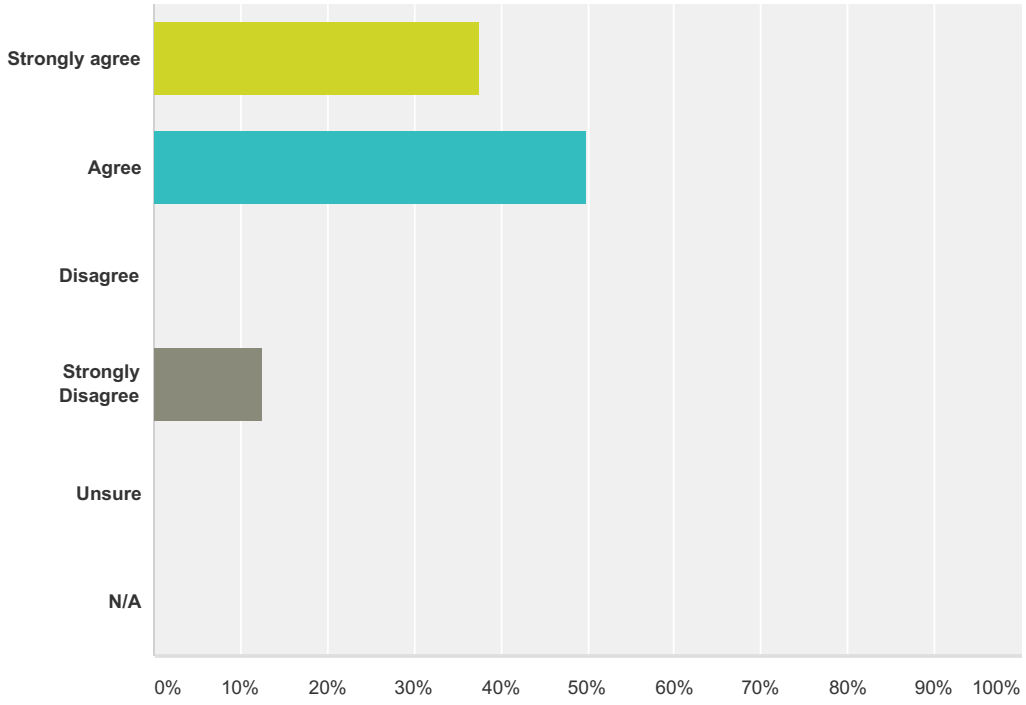


Answer Choices	Responses	
Power Line Construction and Maintenance (Diploma)	**50.00%**	4
Propane and Natural Gas Technologies (Diploma)	**12.50%**	1
Industrial Maintenance Technologies (Diploma)	**0.00%**	0
Industrial Maintenance Technologies (AAS)	**0.00%**	0
Electrical Utilities and Substation Technology (AAS)	**12.50%**	1
Utilities Technology (AAS)	**0.00%**	0
Other (please specify)	**25.00%**	2
Total		**8**

#	Other (please specify)	Date
1	CDL	5/31/2016 1:55 PM
2	transportation/CDL	5/31/2016 1:53 PM

Q2 I am/was closely involved in developing the curriculum for the courses in my program.

Answered: 8 Skipped: 0



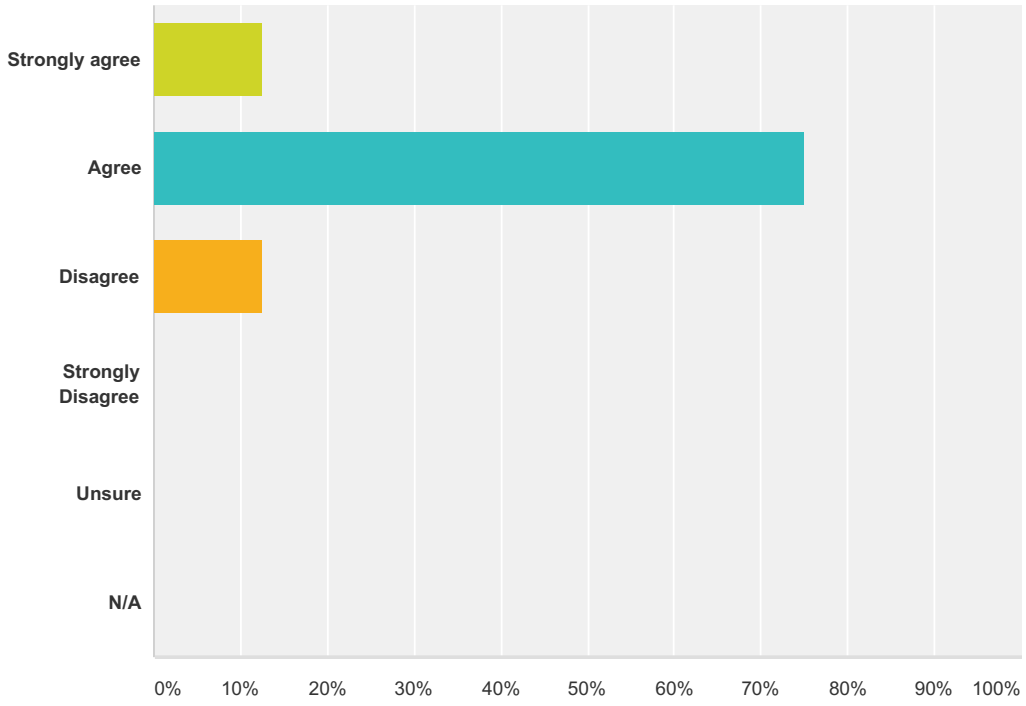
Answer Choices	Responses	
Strongly agree	**37.50%**	3
Agree	**50.00%**	4
Disagree	**0.00%**	0
Strongly Disagree	**12.50%**	1
Unsure	**0.00%**	0
N/A	**0.00%**	0
Total		**8**

#	Comments:	Date
1	just for power grid, but just a little in outdoor lab	5/31/2016 1:49 PM

Q3 How was the curriculum for the courses you teach improved or expanded as a result of South Dakota Energy Career Pathways grant project?

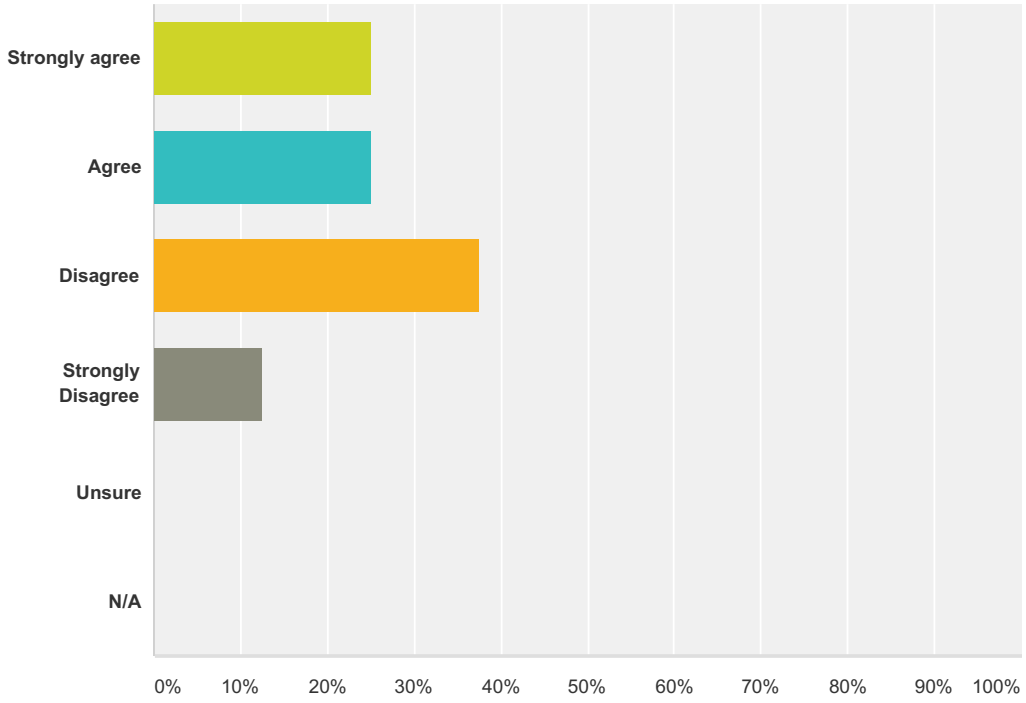
Answered: 8 Skipped: 0

#	Responses	Date
1	improved safety and ability	5/31/2016 1:55 PM
2	both expanded and improved by the use of driving simulators	5/31/2016 1:53 PM
3	more material and newer equipment	5/31/2016 1:49 PM
4	not answered	5/31/2016 1:41 PM
5	the need for more equipment added more students	5/31/2016 1:38 PM
6	good	5/31/2016 1:36 PM
7	not answered	5/31/2016 1:34 PM
8	training equipment and simulators were very helpful.	5/31/2016 1:22 PM

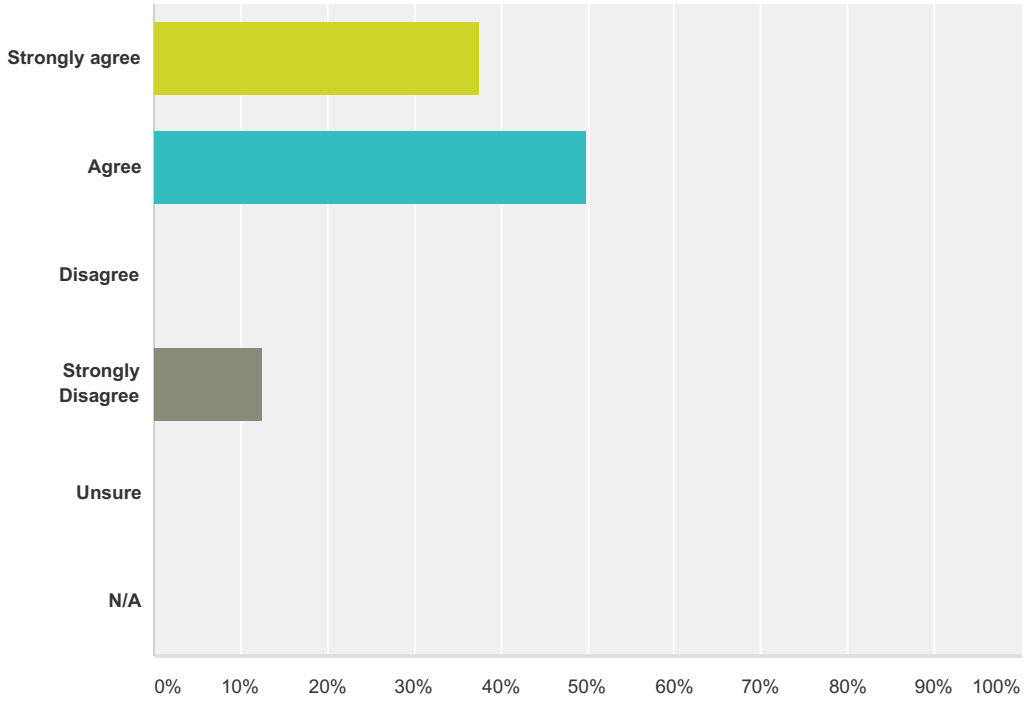


Answer Choices	Responses	
Strongly agree		
Agree		
Disagree		
Strongly Disagree		
Unsure		
N/A		
	12.50%	1
	75.00%	6
	12.50%	1
	0.00%	0
	0.00%	0
	0.00%	0
Total		**8**

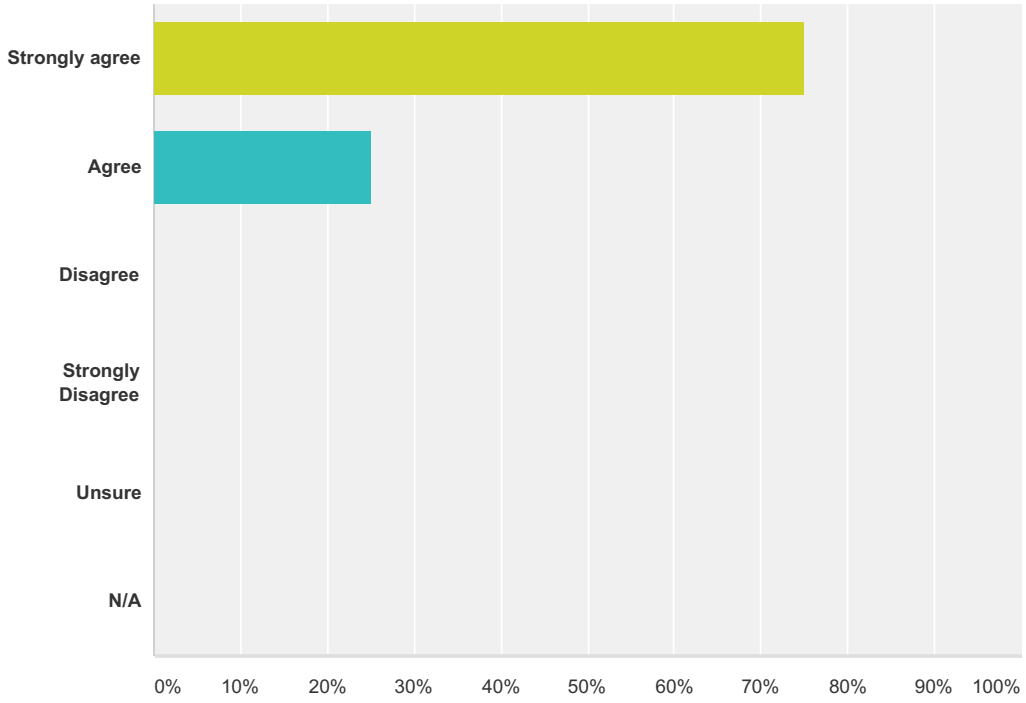
#	Comments:	Date



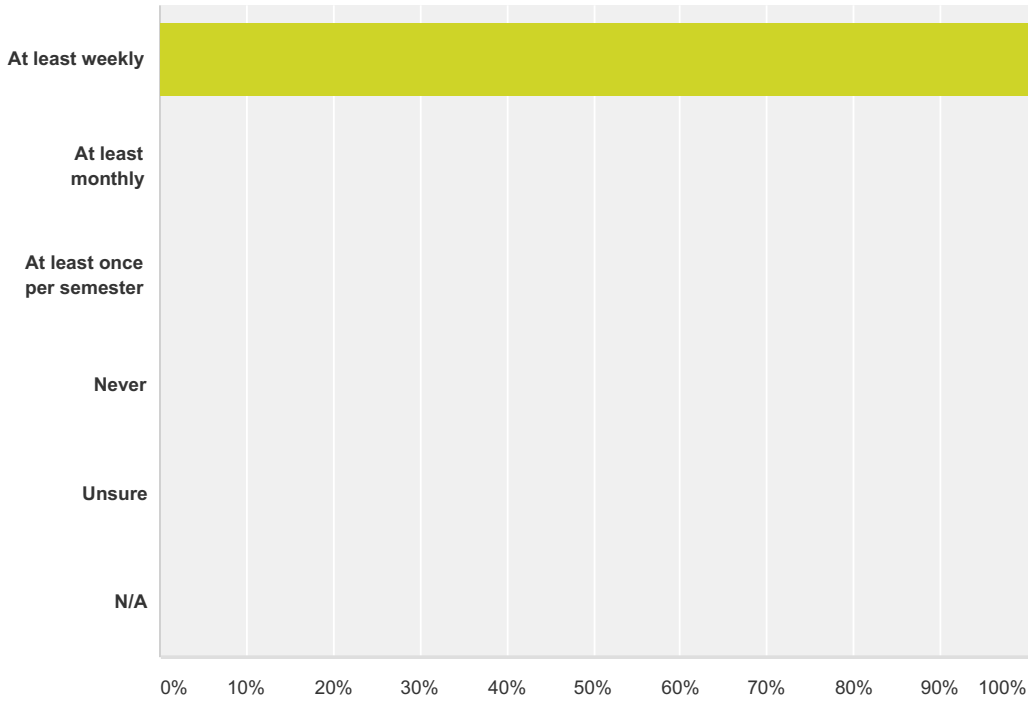
Answer Choices	Responses
Strongly agree	
Agree	
Disagree	
Strongly Disagree	
Unsure	
N/A	



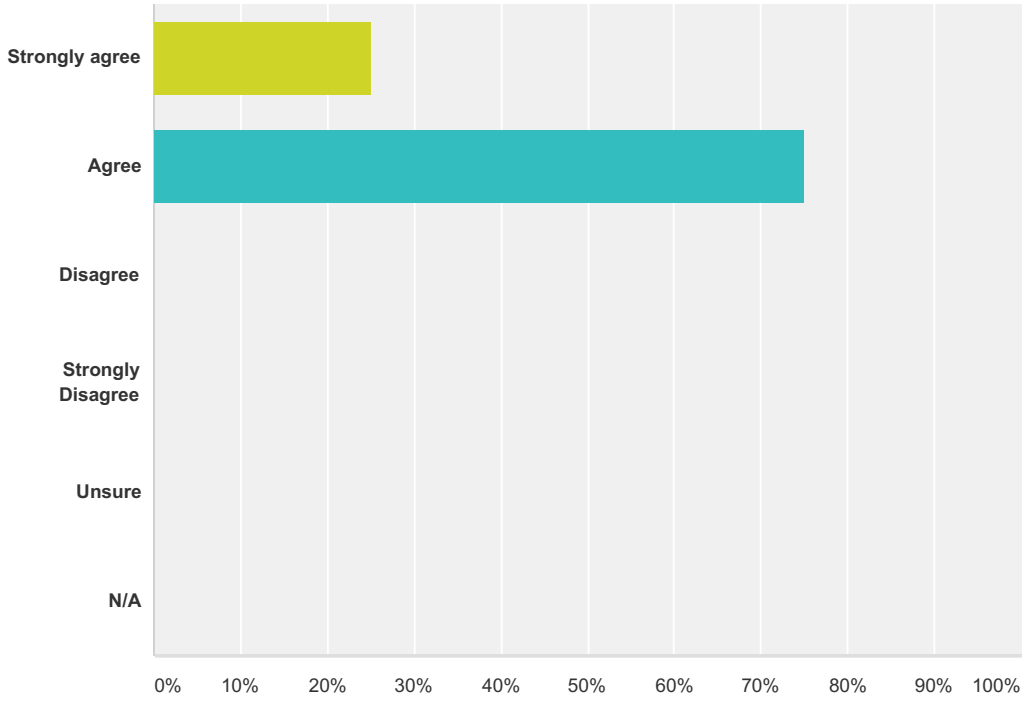
Answer Choices	Responses
Strongly agree	
Agree	
Disagree	
Strongly Disagree	
Unsure	
N/A	



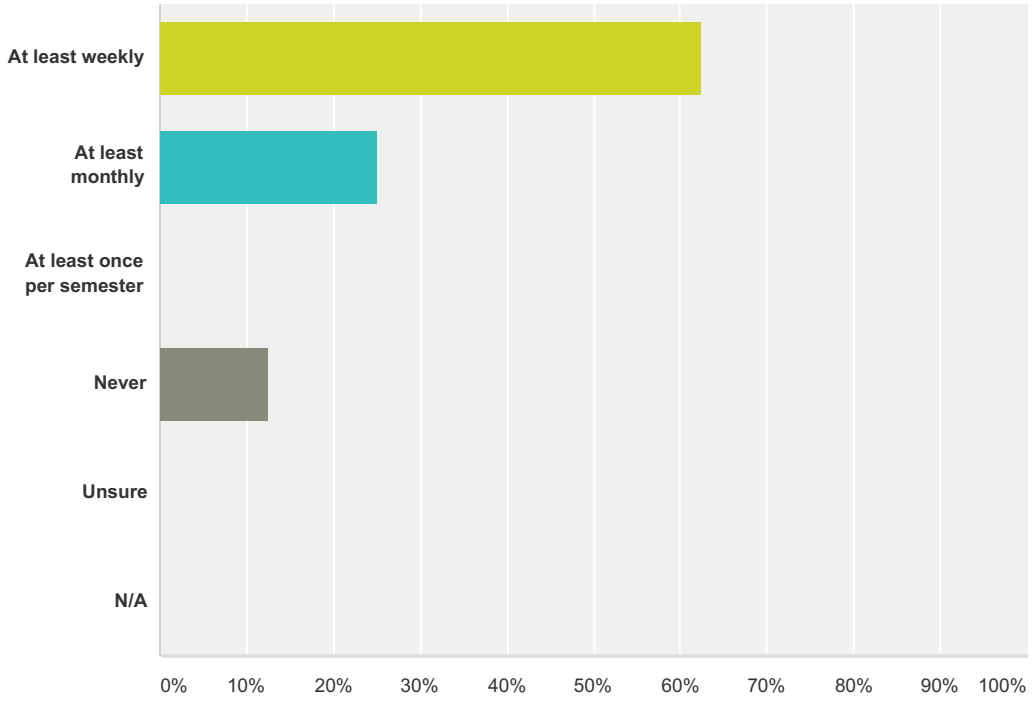
Answer Choices	Responses
Strongly agree	
Agree	
Disagree	
Strongly Disagree	
Unsure	
N/A	



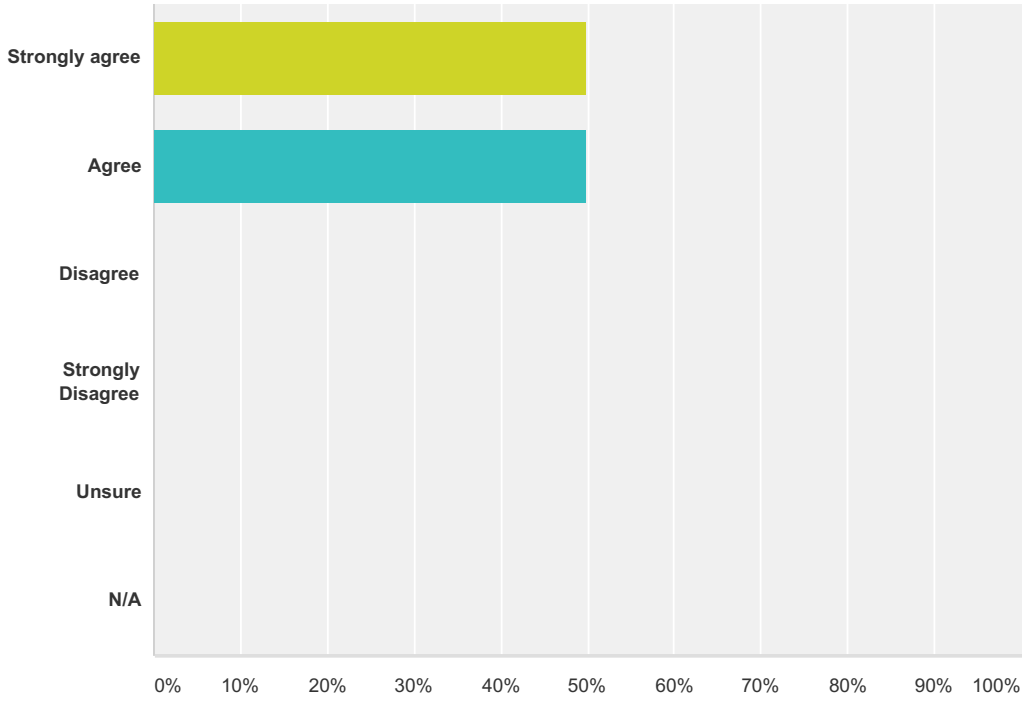
Answer Choices	Responses
At least weekly	
At least monthly	
At least once per semester	
Never	
Unsure	
N/A	



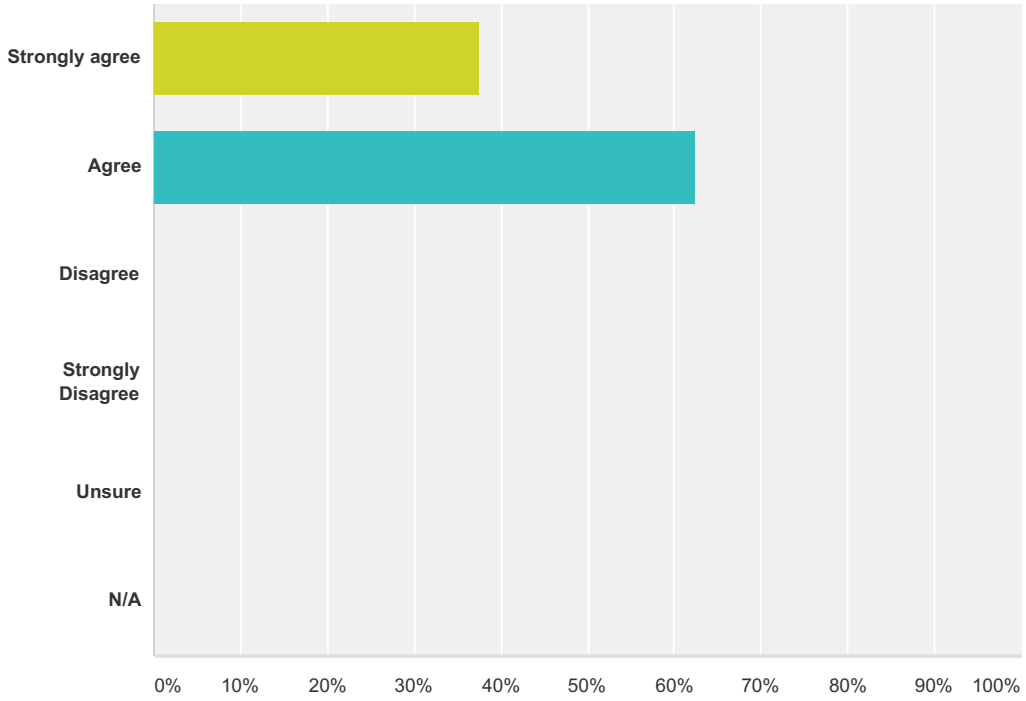
Answer Choices	Responses
Strongly agree	
Agree	
Disagree	
Strongly Disagree	
Unsure	
N/A	



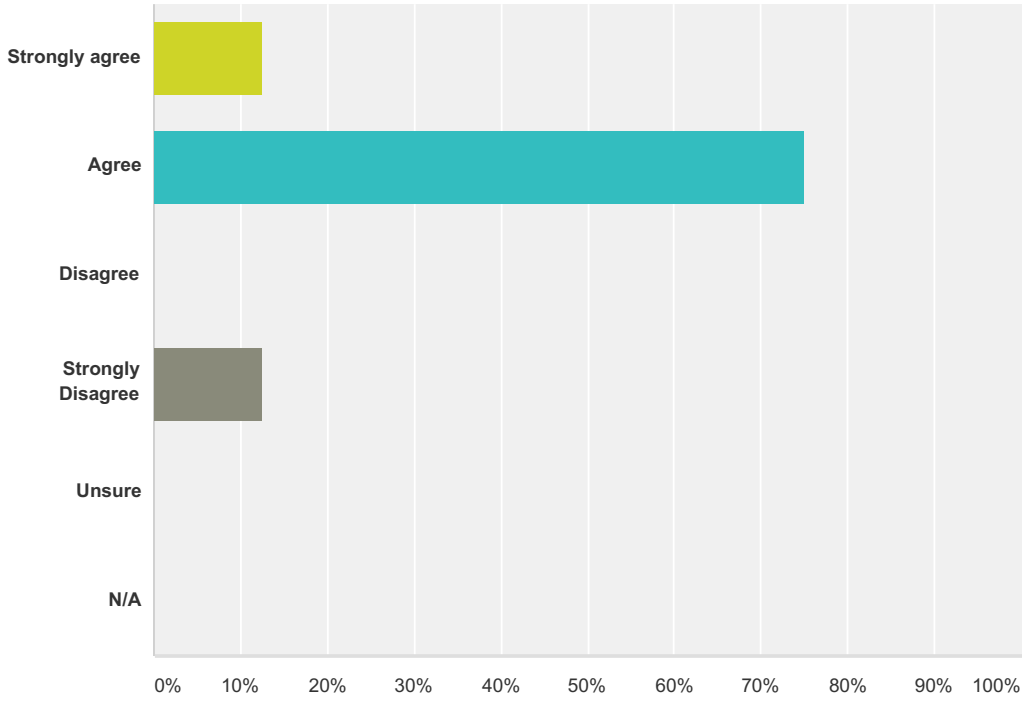
Answer Choices	Responses
At least weekly	
At least monthly	
At least once per semester	
Never	
Unsure	
N/A	



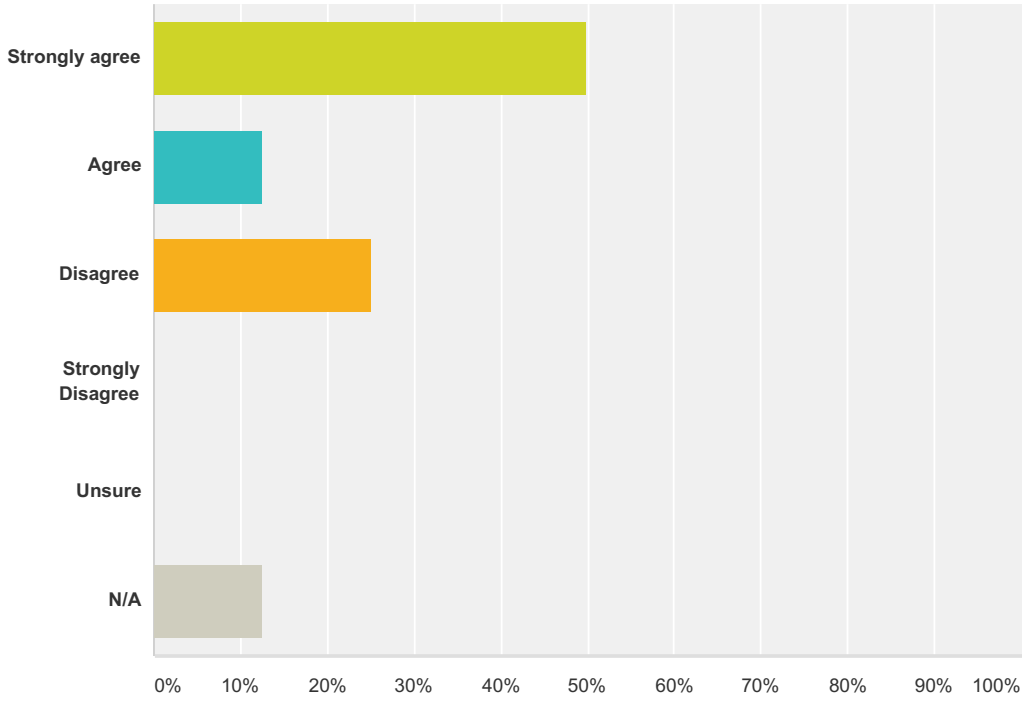
Answer Choices	Responses
Strongly agree	
Agree	
Disagree	
Strongly Disagree	
Unsure	
N/A	



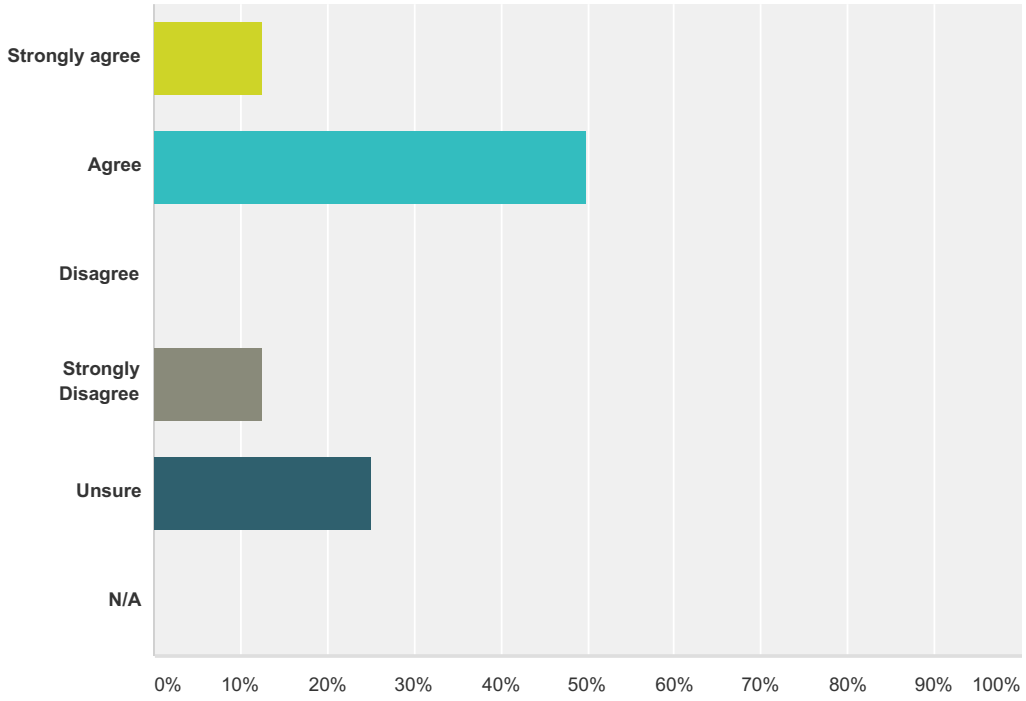
Answer Choices	Responses
Strongly agree	
Agree	
Disagree	
Strongly Disagree	
Unsure	
N/A	



Answer Choices	Responses
Strongly agree	
Agree	
Disagree	
Strongly Disagree	
Unsure	
N/A	



Answer Choices	Responses
Strongly agree	
Agree	
Disagree	
Strongly Disagree	
Unsure	
N/A	



Answer Choices	Responses
Strongly agree	
Agree	
Disagree	
Strongly Disagree	
Unsure	
N/A	

Commercial Driver's License (CDL) Student Survey

Dear Student,
You are asked to take part in this survey if you took TRAN 100/CDL at Mitchell Technical Institute (MTI) during or after fall 2015. The TRAN 100/CDL class received a driving simulator as part of Department of Labor grant in late fall 2015, and we want to learn from you how the simulator affected your training.

1) Using a scale of 1 - 5 with 5 being very experienced and 1 being no experience, what was your prior experience with the following on a commercial vehicle:

A) Driving:

	1	2	3	4	5	
No Experience	◯	◯	◯	◯	◯	Very Experienced

B) Backing:

	1	2	3	4	5	
No Experience	◯	◯	◯	◯	◯	Very Experienced

C) Shifting:

	1	2	3	4	5	
No Experience	◯	◯	◯	◯	◯	Very Experienced

2) When did you take the CDL training?

Choose

3) Did you use the simulator as part of your CDL training?

◯ Yes

◯ No

A) How many times (sessions) did you use it?

Your answer

B) For a total estimated time of use (in hours).

Your answer

4) Did you find the simulator helpful to the overall CDL training?

- ◯ Yes
- ◯ No
- ◯ Unsure

5) What was one way in which it was helpful (if any)?

Your answer

6) What was one way in which it was not helpful (if any)?

Your answer

7) Would you recommend for others to take CDL training from MTI?

- ◯ Yes
- ◯ No
- ◯ Unsure

8) Did using the simulator increase or decrease the likelihood of you recommending MTI's CDL training to others?

- ◯ Increase
- ◯ Decrease
- ◯ No Change
- ◯ Didn't Use

9) Do you have any suggestions for other uses of the simulator that might have been helpful prior to actual driving experience?

Your answer

10) On a scale of 1 - 5 with 5 being the most comfortable, what was your comfort level just before you got behind the wheel of the actual truck for the first time?

Very Uncomfortable						Very Comfortable
	◯	◯	◯	◯	◯	

11) On a scale of 1 - 5 with 5 being the most comfortable, what was your comfort level after you drove the actual truck for the first time?

Very Uncomfortable						Very Comfortable

12) In what program are you currently enrolled?

- AG
- PNG
- PL

13) When did you take the CDL training?

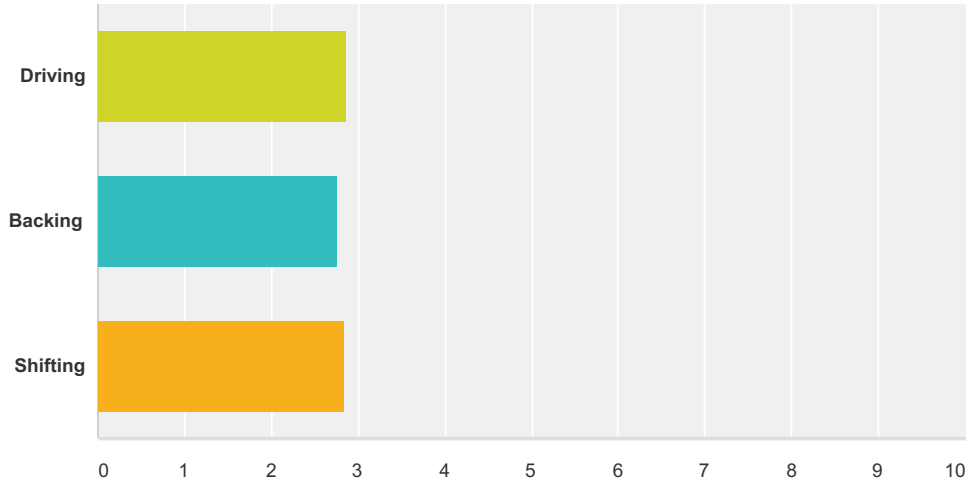
Choose

SUBMIT

Never submit passwords through Google Forms.

Q1 Using a scale of 1-5 with 5 being very experienced and 1 being no experience, what was your prior experience with the following skills on a commercial vehicle?

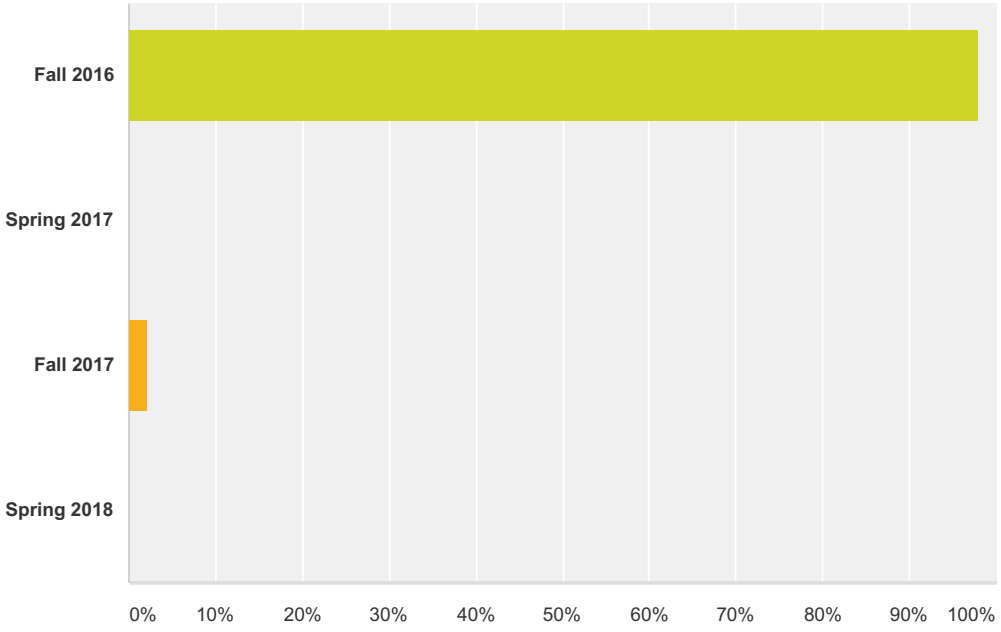
Answered: 46 Skipped: 0



	1 (no experience)	2	3	4	5 (very experienced)	Total	Weighted Average
Driving	**26.09%** 12	**13.04%** 6	**21.74%** 10	**28.26%** 13	**10.87%** 5	46	2.85
Backing	**25.00%** 11	**18.18%** 8	**20.45%** 9	**29.55%** 13	**6.82%** 3	44	2.75
Shifting	**22.73%** 10	**20.45%** 9	**18.18%** 8	**27.27%** 12	**11.36%** 5	44	2.84

Q2 When did you take the CDL training?

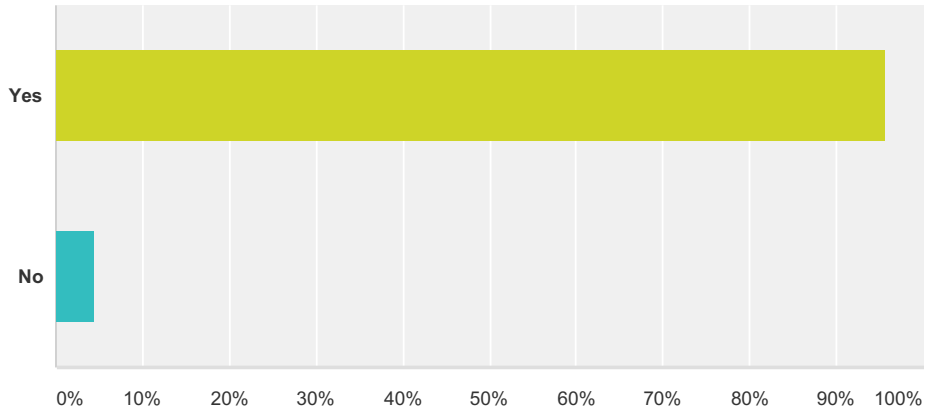
Answered: 46 Skipped: 0



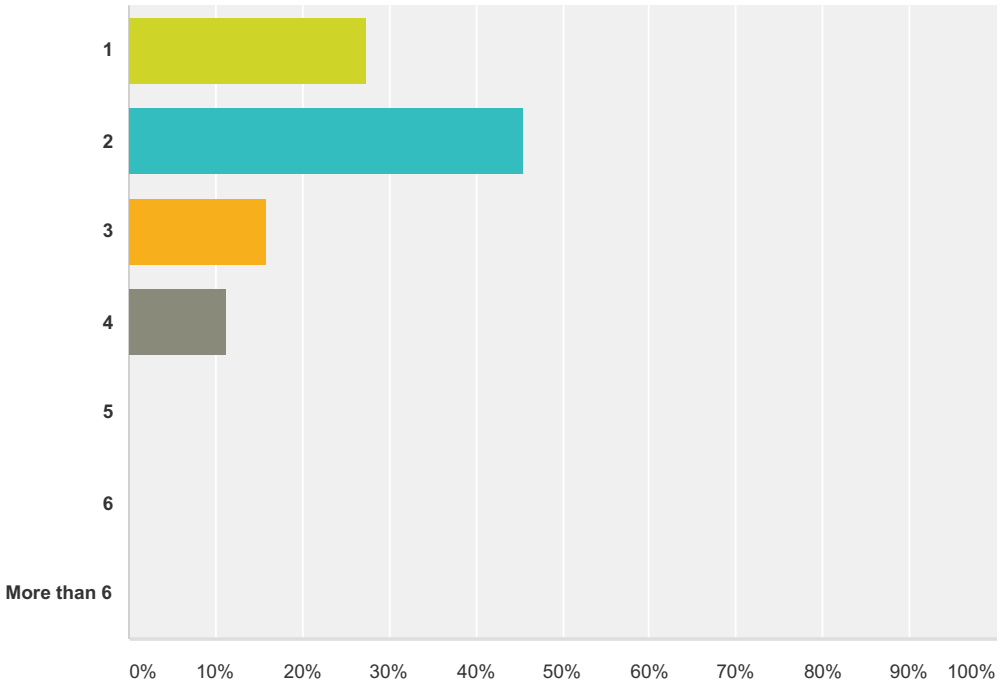
Answer Choices	Responses	
Fall 2016	**97.83%**	45
Spring 2017	**0.00%**	0
Fall 2017	**2.17%**	1
Spring 2018	**0.00%**	0
Total		**46**

Q3 Did you use the simulator as part of your CDL training?

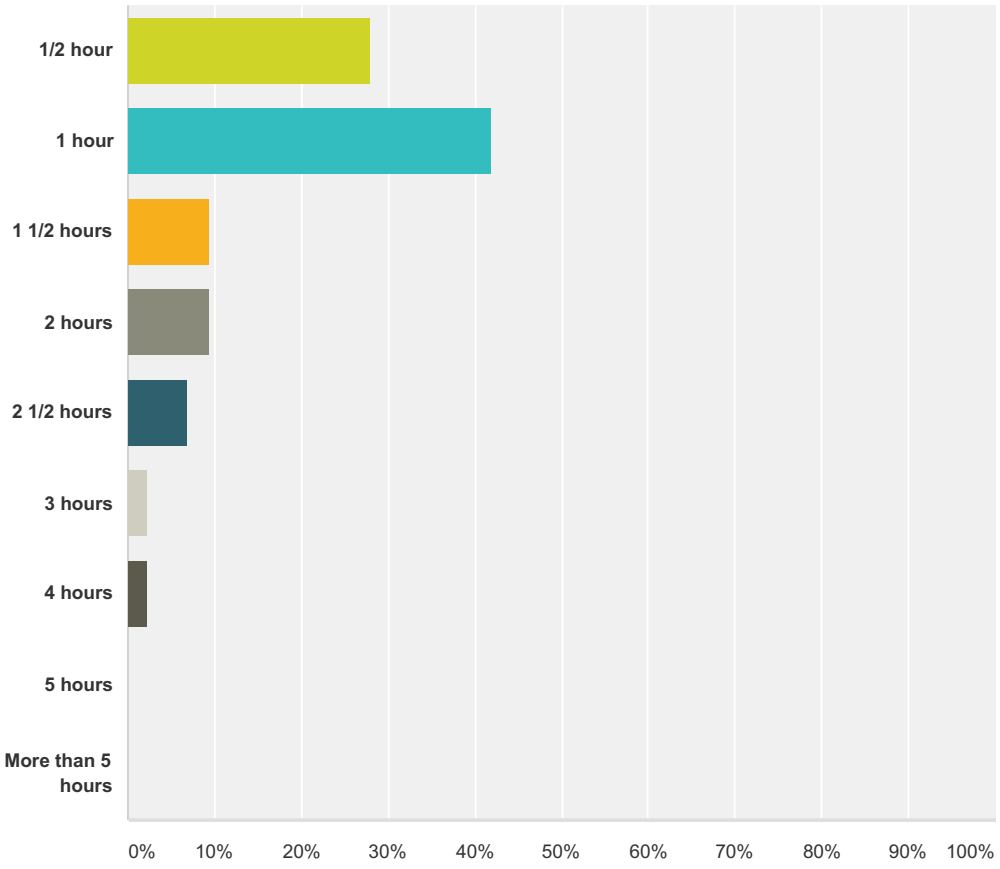
Answered: 46 Skipped: 0



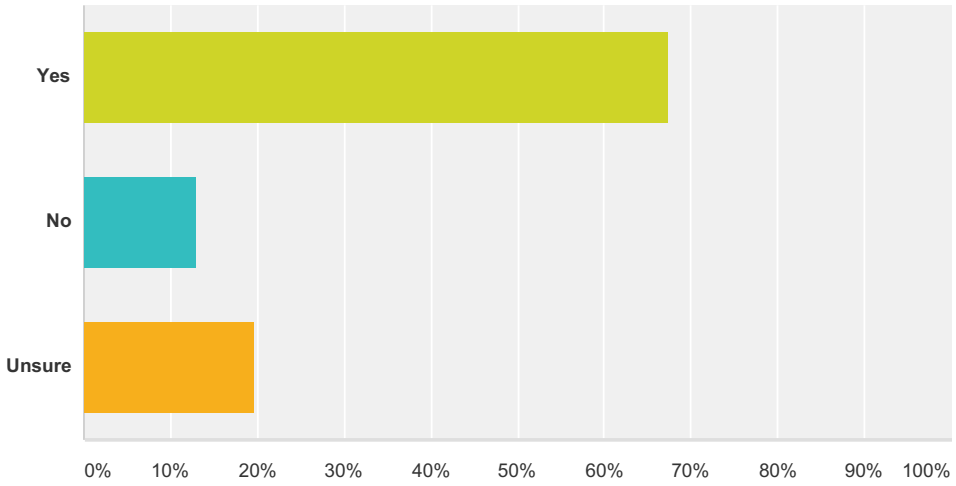
Answer Choices	Responses	
Yes	**95.65%**	44
No	**4.35%**	2
Total		**46**



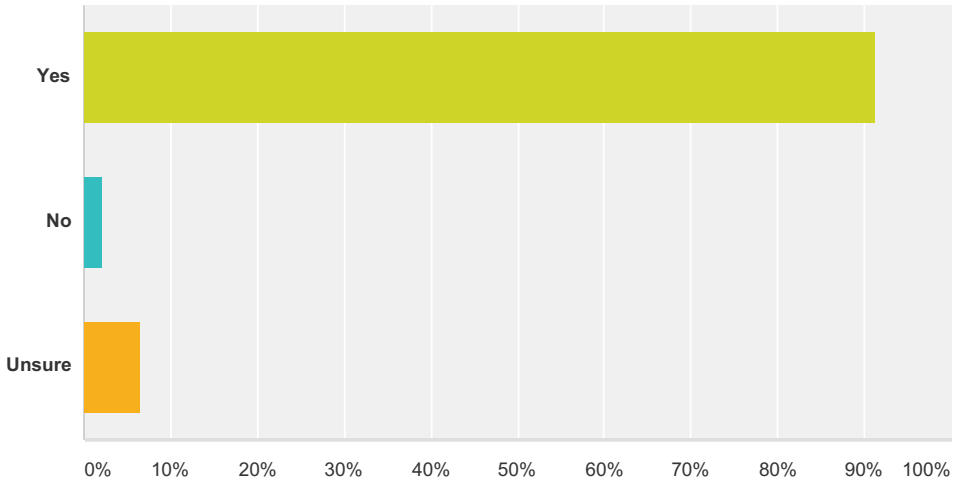
Answer Choices	Responses	
1	**27.27%**	12
2	**45.45%**	20
3	**15.91%**	7
4	**11.36%**	5
5	**0.00%**	0
6	**0.00%**	0
More than 6	**0.00%**	0
Total		**44**



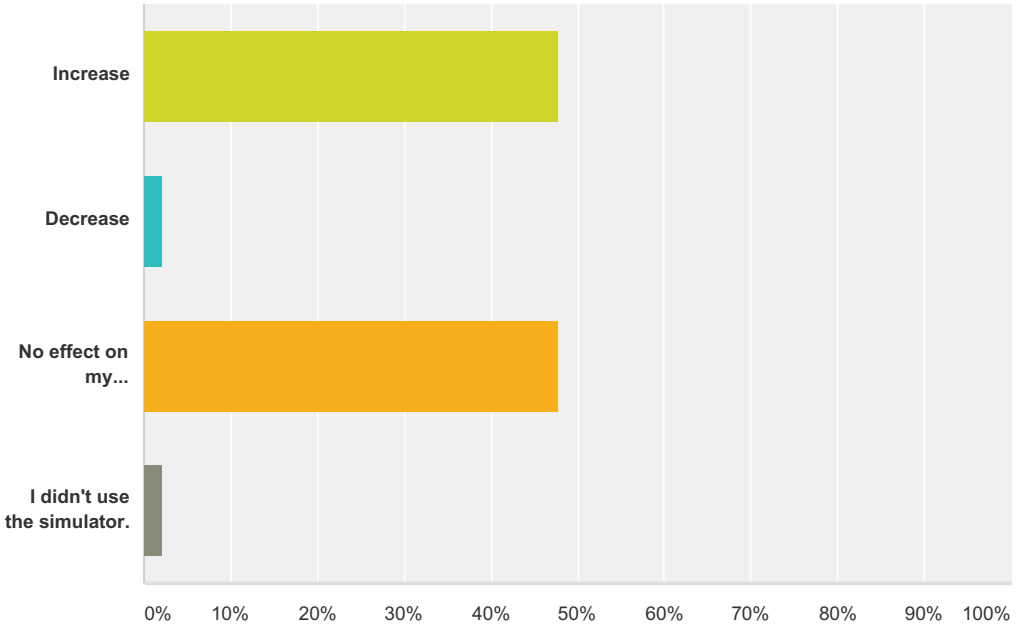
Answer Choices	Responses
1/2 hour	
1 hour	
1 1/2 hours	
2 hours	
2 1/2 hours	
3 hours	
4 hours	
5 hours	
More than 5 hours	



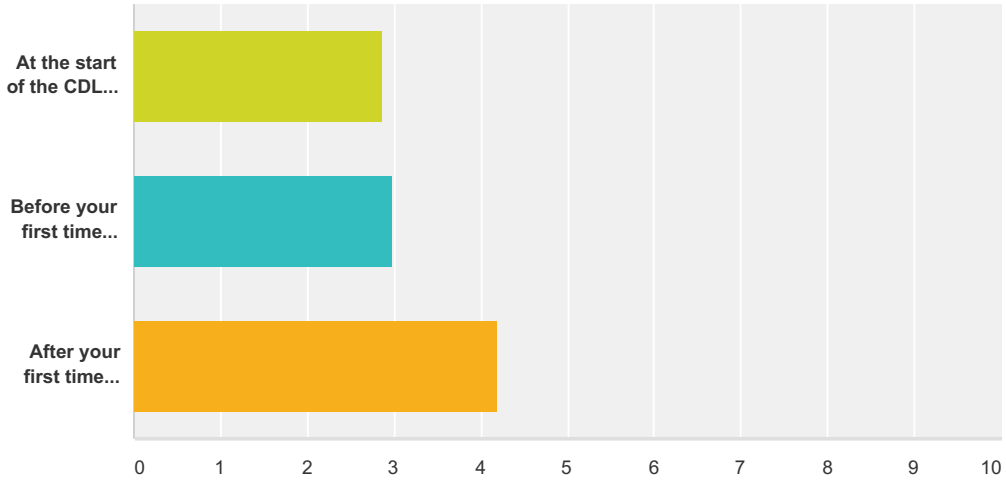
Answer Choices	Responses
Yes	
No	
Unsure	



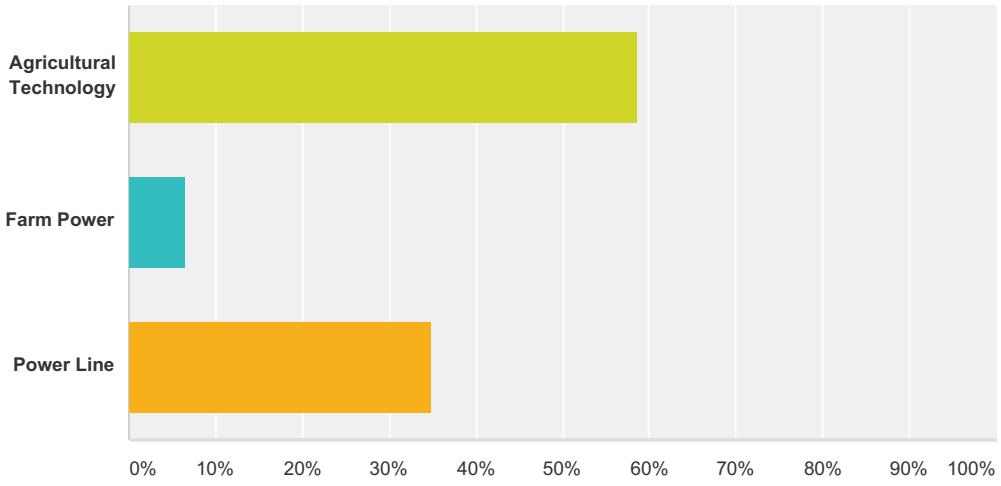
Answer Choices	Responses
Yes	
No	
Unsure	



Answer Choices	Responses
Increase	
Decrease	
No effect on my recommendation.	
I didn't use the simulator.	



	1 (very uncomfortable)	2	3	4	5 (very comfortable)	Total	Weighted Average
At the start of the CDL course?							
Before your first time driving the actual truck?							
After your first time driving the actual truck?							



Answer Choices	Responses
Agricultural Technology	
Farm Power	
Power Line	

Appendix D

EVALUATION BRIEF

THE SOUTH DAKOTA ENERGY CAREER PATHWAYS PROJECT @ MITCHELL TECHNICAL INSTITUTE

POWER TO THE PEOPLE

Launched in October 2014 with a grant from the U. S. Department of Labor, the **South Dakota Energy Career Pathways project (SDECP)** involves six programs at MTI. Those programs include: Power Line Construction and Maintenance (PL), Propane and Natural Gas Technologies (PNG), Industrial Maintenance Technologies (IMT), Electrical Utilities and Substation Technology (EUST), and Utilities Technology (UT). The project is grant funded for four years and is now at its midway point.

The SDECP project strives to meet three main goals. The first goal is to increase the number of participants earning AAS degrees, diplomas and other industry-recognized credentials in the fields of energy and utilities. MTI exceeded its target goal in the first year of the project (2014-15) as 106 students completed a grant-funded program of study.

The second goal of the project is to introduce or replicate innovative and effective methods for designing and delivering instruction that address specific industry needs and lead to improved learning. The evolving "outdoor lab" is a centerpiece of innovation for curriculum and instruction for all six SDECP programs. It includes an electrical substation (shown above) that the EUST and PL students are constructing.

The third goal of the

THE SURVEY SAYS

Students enrolled in MTI's SDECP programs were surveyed in May 2016. Ninety-five surveys were distributed and 92 were returned for a response rate of 97%. As shown below, the student responses point out some of the positive aspects of the SDECP project.

- ✓ **65%** of students felt the **tech support** at MTI was either helpful or extremely helpful.
- ✓ **86%** reported that the **curriculum** in their program was either effective or extremely effective.
- ✓ **95%** said they were either satisfied or very satisfied with the **overall quality** of their program.
- ✓ **100%** of students reported that the **outdoor lab** either enhances or greatly enhances their program.

project is to improve employment outcomes for graduates of SDECP programs. This includes increasing the number of individuals employed in the fields of energy and utilities as well as wage increases for those who are already employed in those fields. Of the 92 survey respondents in May 2016, 40% reported that they had already secured employment in either the energy or utilities field.

MTI is utilizing a total of 14 different activities to meet the goals of the project. Progress with the project appears to be right on schedule as seven of those activities are currently deemed to be at full implementation.

One current challenge facing the SDECP project involves the fate of the Propane and Natural Gas (PNG) program. The PNG program now serves as the first half of the pathway to an AAS degree in Utilities Technology (UT). Project leaders plan to determine the future of the program during the 2016-17 school year. The input from current PNG students is clear as 8 of the 10 who completed the May 2016 survey commented that the program should be continued.

SDECP grant funds are keeping the project moving through the summer months. During the summer of 2016, some instructors were paid to develop curriculum for the PL Registered Apprentice Program, while others were paid to install donated and purchased equipment in the Electrical Substation.

DRIVING TOWARD SUCCESS

Students in the Power Line Construction and Maintenance program (PL) are required to earn their Commercial Driver's License (CDL). SDECP grant funds made it possible for MTI to purchase two state-of-the-art driving simulators to support the CDL program.

A total of 122 students in the CDL program were surveyed in April 2016. Sixty-one students completed the survey, including 55 from the Power Line program, for a response rate of 50%. Survey results indicated that 79% of the students found the simulators to be helpful to the overall CDL training. Two-thirds of the students said the simulators helped most with learning to shift various transmissions.

CDL instructors report that the simulators are making a huge difference in student abilities behind the wheel. The high tech simulators have helped students gain proficiency faster and with more confidence, as well as saving wear and tear on the actual trucks.

This evaluation brief was prepared by John Swanson and Karen Taylor from TIE, the third-party evaluator for the SDECP project.

Appendix E

South Dakota

Energy

Career Pathways

Great Jobs in ENERGY!

Have you ever considered a job in the Energy Industry?

There are great reasons why you should.

MTI Mitchell Technical Institute

Energy Career Pathways

Energy transmission and distribution are essential to our way of life – from the generation of electricity or gas products to the maintenance of power lines, propane tanks or gas lines near our homes. Every point along this path requires someone to construct or maintain it – this means jobs now AND in the future. In fact, there is an increasing need to fill these positions as large numbers of "baby-boomers" are retiring soon, and, since almost every community in the United States has a similar infrastructure, the need is evident in most parts of the country. Salaries are great and demand is high: take a look!

The pictograph shows where different types of skilled technicians are needed.

- Power Line Technician
- Electrical Substation Technician
- Wind Turbine Technician
- Natural Gas Technician
- Propane Service Technician
- Propane Delivery Representative
- Industrial Maintenance Technician

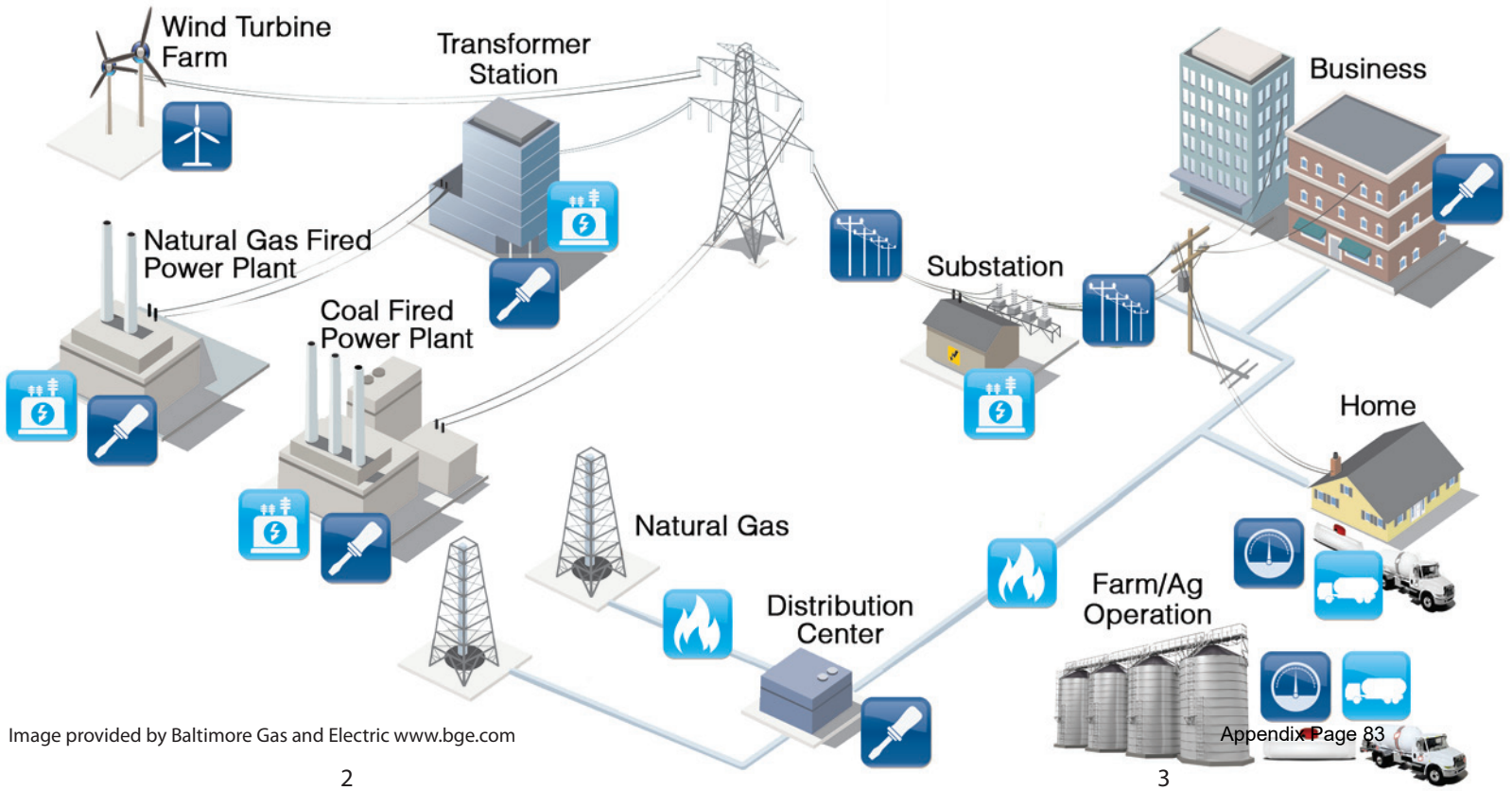


Image provided by Baltimore Gas and Electric www.bge.com

Advantages to Technical Careers in the Energy Fields

- Excellent salaries
- High job placement; huge industry need in most fields
- Find job opportunities in your desired location
- Hands-on outdoor work
- Life-long careers serving your community
- Only 1 or 2 years training required; lower cost and less loan debt than a four-year college experience

Energy Career Programs at Mitchell Technical Institute

- Power Line Construction & Maintenance
- Electrical Utilities & Substation Technology
- Wind Turbine Technology
- Propane & Natural Gas Technology
- Industrial Maintenance Technology

Power Line Technician

Power Line Technicians (also known as lineworkers, line installers, or line technicians) install and repair overhead and underground power cables. They also maintain and install other critical transmission and distribution equipment that help power homes, businesses, hospitals, schools and other structures requiring power.

Required Skills

- Install necessary equipment on poles
- Climb poles or use truck-mounted buckets to reach equipment
- Identify defective devises such as fuses, switches, breakers, and wires
- Practice safety and proper use of safety equipment; poles and towers carry high voltage electricity
- Inspect and test power lines and other equipment using special testing devices
- Install underground cables

Power Line Technicians also need to:

- Show a good-natured, cooperative attitude
- Work well with others
- Listen to and understand customer needs and how to meet them
- Be able to be on their feet for long periods of time
- Be comfortable at heights or working outdoors in extreme weather

Testing and Certificates/Licenses

MTI offers a 9-month Power Line Construction and Maintenance Certification. As part of that program, the student will also acquire the Qualified Climber Certification, Pole Top Rescue Certification, and Competent Person Certification. Also required for the program are a Commercial Driver's License and OSHA 10 Construction Safety. Pre-employment testing is typically required. Many companies require a passing score on industry exams before being considered for employment. Some companies have an apprenticeship program policy.

SD Job Projections & Wages

SD Depart of Labor & Regulations Job Title	2010 Workers	Average Annual Demand	2020 Projections	% Job Growth 2020	2014 Median Wage
Electrical Power Line Installers and Repairers	825	38	915	10.90	$31.97/hr

From SD DLR Labor Market Information Center

The Future of Power Line Work

The future of linework is in Smart Grid Technology. The "Smart Grid" consists of devices connected to transmission and distribution lines that allow utilities and customers to receive digital information and communicate with the grid. These devices allow a utility to determine where an outage or other problem is on the line and even fix the problem in some circumstances.*

Want to learn more? Check out Mitchell Technical Institute. **www.mitchelltech.edu/programs**

* U.S. Energy Information Administration

Electrical Substation Technician

Technicians do a lot of hands-on work, including installing equipment, monitoring equipment performance, troubleshooting and repairing equipment. Overall, they are in charge of making sure machines, mechanical equipment, and buildings inside a power plant, switch yard or substation are working properly and are in good condition.

Mitchell Technical Institute Substation students install new equipment at the campus training field.

Required Skills

- Inspect things like motors and belts, fluid levels, and filters
- Take apart electrical equipment, then repair and replace parts using hand or power tools including hammers, saws drills, wrenches, and testing equipment, as well as hoists and cranes
- Use repair manuals and schematics to determine and fix problems
- Keep proper logs of work progress and completion
- Perform preventive maintenance on electrical and mechanical equipment, including inspections and testing, installation of new wiring, electrical components, and machinery and equipment
- Practice safety consciousness; mechanical and electrical equipment can be very dangerous.

Electrical Substation Technicians also need to:

- Be good listeners
- Be curious about how things work
- Solve problems and not be afraid to ask questions
- Concentrate for a long period of time without being distracted
- Know how to manage their time
- Be able to stand and kneel in small and/or high places

Testing and Certificates/Licenses

MTI's Electrical Utilities & Substation AAS degree is offered as the second year of several other programs, including Power Line and Electrical Construction & Maintenance (MTI or non-MTI certifications). Pre-employment testing is typically required. Many companies require a passing score on the industry exams before the technician is considered for employment. A Commercial Driver's License (CDL) may also be needed, and some companies have an apprenticeship program policy.

Average Annual Salary and Outlook

SD Department of Labor and Regulations Job Title	2014 workers	2014 Median wage
49-2095 Electrical & Electronics Repairers, Power, Substation, and Relay	60	$38.25/hr

From SD DLR Labor Market Information Center

The Future of Electrical Substation Work

The future of technician work is summed up in one word: technology. The technology used in power stations, substation, the smart grid, and other energy infrastructure is constantly advancing within a technician's scope of work. It is essential for technicians to keep their skills sharp in the field to be an integral part of all that is happening in the energy industry!

Want to learn more? Check out Mitchell Technical Institute. **www.mitchelltech.edu/programs**

Wind Turbine Technician

Wind turbine service technicians, also known as wind techs, install, maintain, and repair wind turbines. Wind turbine service technicians generally work outdoors, often at great heights. When doing maintenance, working in confined spaces is common. Although most work full time during regular business hours, some may be on call to handle emergencies during evenings and weekends.

Required Skills

- Inspect things like motors, fluid levels, and filters
- Take apart machines, then repair and replace parts using hand or power tools including hammers, saws drills, wrenches, and measuring instruments, as well as hoists and cranes
- Use repair manuals and schematics to determine and fix problems
- Keep proper logs of work progress and completion
- Do preventive maintenance on machines, mechanical equipment, and buildings, including inspections and testing, installation of new wiring, electrical components, piping and plumbing and machinery and equipment
- Practice safety consciousness: tremendous heights, and mechanical and electrical equipment can be very dangerous.

Wind Turbine Technicians also need to:

- Be good listeners
- Be curious about how things work
- Solve problems and not be afraid to ask questions
- Concentrate for a long period of time without being distracted
- Know how to manage their time
- Be able to stand and kneel in small and/or high places

Testing and Certificates/Licenses

MTI offers a two year AAS Degree in Wind Turbine Technology. As part of the program, students will acquire tower climbing, OSHA Safety and First Aid/ CPR certifications. Pre-employment testing is typically required. Many companies require a passing score on the industry exams before the technician is considered for employment. A Commercial Driver's License (CDL) may also be needed, and some companies have an apprenticeship program policy.

Average Annual Salary and Outlook

The median annual wage for wind turbine service technicians was $45,970 with a projected 24% growth rate in employment opportunities.

From May 2012 Bureau of Labor Statistics Occupational Outlook Handbook (http://www.bls.gov/ooh/installation-maintenance-and-repair/wind-turbine-technicians.htm)

The Future of Wind Turbine Work

The American Wind Energy Association (AWEA) states that installed wind energy capacity in the United States was under 3,000 megawatts in 2000. In 2010, it was over 35,000 megawatts, enough electricity to power approximately 9.7 million homes. A typical 250 MW wind farm (around 100 turbines) will create 1,073 jobs over the lifetime of the project. The Department of Energy predicts a potential of 200-265,000 new jobs by 2030.

http://www.bls.gov/green/wind_energy/
http://www.nrdc.org/energy/renewables/wind.asp
http://www.energy.gov/windvision

Want to learn more? Check out Mitchell Technical Institute.
www.mitchelltech.edu/programs

Natural Gas Technician

Natural Gas Technicians lay and maintain pipe for gas distribution, and are essential for the smooth operation of both electric and gas utilities.

Required Skills

- Follow the directions of others or written instructions to lay out pipe routes
- Cut pipes to required size, position them, and use fusion or mechanical technologies for coupling
- Cover pipes with earth or other materials
- Find and repair or replace pipes using special magnetic or radio indicators
- Use GIS/GPS technologies to locate and/or designate a project or repair (operational surveys)
- Test, service and install meters and regulators, odorization, meter and regulation, tapping, fitting and equipment operation
- Respond to, locate, and repair gas leaks, including emergencies, and cathodic protections
- Work professionally and courteously with customers
- Be safe and use safety equipment

Natural Gas Technicians also need to:

- Work with little or no supervision
- Be patient and willing to stick it out when things go wrong
- Solve problems
- Enjoy working outdoors in all weather conditions
- Know how to manage their time
- Listen and understand customer needs and how to meet them

Testing and Certificates/Licenses

MTI offers a one year diploma in Propane and Natural Gas Technologies. As part of the program, six industry certifications are required, as well as OSHA Safety and Commercial Driver's License (CDL) certifications. Pre-employment testing is typically required. Many companies require a passing score on the industry exams before the technician is considered for employment. Some companies have an apprenticeship program policy.

Average Annual Salary and Outlook

Surveys by the Center for Energy Workforce Development (CEWD) of the natural gas industry shows that average salaries for Natural Gas Service Technicians with several years' experience is $51,000.

http://www.cewd.org/roadmap/natural_gas_service_technicians-student.html

The Future of Natural Gas Tech Work

As new power plants and energy technologies are developed, skilled Natural Gas Technicians will be critical to integrate, install, and maintain these technologies to help generate and transmit tomorrow's power supply. Due to its efficiency, cleanliness, and reliability, natural gas is growing in popularity. The American Gas Association (AGA) states most of the growth in natural gas demand comes from electricity generators, who have turned to natural gas because it is the cleanest burning fossil fuel and highly efficient. More natural gas means more jobs.

Want to learn more? Check out Mitchell Technical Institute. **www.mitchelltech.edu/programs**

Propane Service Technician

Propane Service Technicians are responsible for delivering, installing and removing large propane tanks at permanent or temporary locations. A service tech drives a flatbed truck with a crane and boom to deliver tanks.

Required Skills

- Follow the directions of others or written instructions to lay out pipe routes
- Drive a flatbed delivery truck with crane and boom into a large variety of locations
- Use a crane and boom safely
- Respond to, locate, and repair gas leaks, including emergencies
- Operate a trencher to run gas lines
- Assist with sanding, painting, and upkeep of tanks
- Work professionally and courteously with customers
- Be safe and use safety equipment.

Propane Service Techs also need to:

- Work with little or no supervision
- Be patient and willing to stick it out when things go wrong
- Solve problems and not be afraid to ask questions
- Enjoy working outdoors in all weather conditions
- Know how to manage their time
- Listen and understand customer needs and how to meet them.

Testing and Certificates/Licenses

MTI offers a one year diploma in Propane and Natural Gas Technologies. As part of the program, six industry certifications are required, as well as OSHA Safety and Commercial Driver's License (CDL) certifications. Pre-employment testing is typically required. Many companies require a passing score on the industry exams before the technician is considered for employment. Some companies have an apprenticeship program policy.

Average Annual Salary and Outlook

Field Service Technicians in general have an average wage of $18.94. The skills that increase pay for this job the most are Programmable Logic Controllers (PLC)/Automation and Industrial Hydraulics.

From: http://www.payscale.com/research/US/Job=Field_Service_Technician/Hourly_Rate

The Future of Propane Service Tech Work

The annual Hays Oil and Gas Salary Guide conducted for 2013 reported that skill shortages are at the top of the list of concerns for employers in the oil and gas industry. 37% of employers reported skills shortages as their top concern. That is good news for job seekers.

http://www.hays.com/cs/groups/hays_common/@og/@content/documents/promotionalcontent/hays_1204734.pdf

Want to learn more? Check out Mitchell Technical Institute. **www.mitchelltech.edu/programs**

Propane Delivery Representative

A Delivery Representative is a key point of contact for customers. They are dedicated and responsible people who can excel in a fast paced work environment and possesses exceptional people skills.

Required Skills

- Follow the directions of others or written instructions to lay out pipe routes
- Possess good vision and driving record
- Drive a bobtail delivery truck into a large variety of locations
- Work professionally and courteously with customers
- Lift, push, pull, bend, and climb in and out of truck frequently throughout the day
- Be safe and use safety equipment.

Propane Delivery Reps also need to:

- Work with little or no supervision
- Be patient and willing to stick it out when things go wrong
- Solve problems and not be afraid to ask questions
- Enjoy working outdoors in all weather conditions
- Know how to manage time
- Listen and understand customer needs and how to meet them

Testing and Certificates/Licenses

MTI offers a one year diploma in Propane and Natural Gas Technologies. As part of the program, six industry certifications are required, as well as OSHA Safety and Commercial Driver's License (CDL) certifications. Pre-employment testing is typically required. Many companies require a passing score on the industry exams before the technician is considered for employment.

Average Annual Salary and Outlook

South Dakota average salary for a Propane Delivery Representative is around $32,000, with a national average of $40,000.*

The Future of Propane Delivery Work

The U.S. Bureau of Labor Statistics reports that driver jobs for tractor trailers and light trucks are expected to increase 21% and 15%, respectively, through the decade versus 14% for all occupations. The field for tractor trailer or long-haul drivers is wide open, as employers often have trouble filling these positions because of extensive travel and time spent away from families. Drivers who transport light trucks for route sales might face stiffer competition because these drivers cover mostly local territories.*

Want to learn more? Check out Mitchell Technical Institute. **www.mitchelltech.edu/programs**

*http://work.chron.com/much-propane-truck-driver-make-19300.html

Industrial Maintenance Technician

Today's complex and sophisticated buildings, power plants and factories require a highly-trained technical workforce to service and maintain facilities and equipment, control energy costs, and ensure facility quality for owners and clients. Industrial Maintenance Technicians ensure the operation of machinery and mechanical equipment by completing preventive maintenance requirements on engines, motors, pneumatic tools, conveyor systems, and production machines.

Required Skills

- Locate sources of problems by observing mechanical devices in operation and using precision measuring and testing instruments.
- Use technical maintenance skills in multiple areas (mechanical, robotics, electrical)
- Fabricate repair parts by using machine shop instrumentation and equipment
- Be proficient with a wide variety of equipment and tools
- Be safe and use safety equipment
- Ensure a clean, safe environment and follow all safety protocols such as Lock Out/Tag Out
- Demonstrate the ability to communicate industrial maintenance concepts effectively
- Prepare mechanical maintenance reports by collecting, analyzing, and summarizing information and trends
- Use computer technology within field of study
- Master competencies that lead to AWS Welding Certification.

Industrial Maintenance Technicians also need to:

- Work with little or no supervision
- Be patient and willing to stick it out when things go wrong
- Solve problems and not be afraid to ask questions
- Know how to manage time
- Listen and understand customer or employer needs and how to meet them

Testing and Certificates/Licenses

Mitchell Technical Institute offers a unique Industrial Maintenance Technology program (both one-year diploma and two-year AAS degree) that trains students in high-tech industrial skills areas: electrical fundamentals, industrial controls and troubleshooting; hydraulics, welding, mechanical drives, and heating and cooling technology. The second year of the program will expand on basic skills and will allow students to choose an emphasis in either Electrical or Heating and Cooling.

Average Annual Salary and Outlook

SD Department of Labor and Regulations Job Title	2014 Workers	2014 Median Wage
Installation Maintenance and Repair Workers All Other	140	$45,797
Maintenance and Repair Workers General	2,650	$34,547
Industrial Machinery Mechanics	870	$43,465
Maintenance Workers Machinery	60	$29,757

From SD DLR Labor Market Information Center

http://apps.sd.gov/ld54lmicinfo/wages/owlistpuba.asp

The Future of Industrial Maintenance Work

Graduates of this program will find opportunities in many areas like power plants, hospitals, schools, manufacturing, and distribution centers. Organizations which have relatively large facilities using complex HVAC, control or electrical systems either as a part of the facilities or as production equipment will benefit from the addition of an Industrial Maintenance technician to their staff.

Want to learn more? Check out Mitchell Technical Institute.
www.mitchelltech.edu/programs

Energy Programs at Mitchell Technical Institute

- Electrical Utilities & Substation Technology AAS Degree
- Power Line Construction & Maintenance Diploma
- Propane & Natural Gas Technologies Diploma
- Utilities Technology – Power Line
  (Combine Power Line Construction & Maintenance with Propane & Natural Gas Technologies for an AAS degree)
- Wind Turbine Technology AAS Degree
- Industrial Maintenance Technology Diploma & AAS Degree

The Stamp of Endorsement from the Center for Energy Workforce Development (CEWD) validates that these programs meet certain national standards in print reading, mathematics, basic electricity, safety, and hand and power tools.

Contact Information:

Call: 605-995-3025 or 800-684-1969

Email: MTI.Admissions@mitchelltech.edu

Fax: 605-995-3067

Visit: 1800 E. Spruce St., Mitchell, SD

Write to: Admissions Office
Mitchell Technical Institute
1800 E. Spruce St.
Mitchell, SD 57301

Website: www.mitchelltech.edu

Online Application: mitchelltech.edu/apply

Mitchell Technical Institute
1800 East Spruce Street
Mitchell, South Dakota 57301

This workforce solution was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The solution was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.

Brochure created using materials from Get into Energy
www.getintoenergy.com

Appendix F

Substation Advisory Board
Friday, April 8th
11:30-3:00 PM
Campus Center- Lunch (11:30-12:30)
Meeting- ETC 311 (12:30)

AGENDA

1. Lunch in Cafeteria
2. Welcome and Introductions
3. TAACCCT Grant- DeAnna Hatch/John Heemstra
4. Training/Education/Scholarship- Doug Greenway
5. Admissions/Enrollment – Jenna Reis
6. Program Update
   Curriculum- Substation Communications. No other changes.
   Wind to Substation- is it a fit for an AAS degree? Brian Roberts
7. Equipment
8. Internships
9. Mark Wilson- MTI Updates
10. Wrap Up
11. Adjourn

Bit Power
East River Electric
MC Sales, Inc.
Excel Energy

Appendix G

	Donations to the Energy Programs				
updated 12.8.16					
	Donation From:	**Item(s) Donated**	**Date Donated**	**Estimated Value**	**Program Receiving Donation**
	City of Vermillion	Steel Structures	Jun-10	$ 3,000	Substation
		Circuit Breaker Switches			
	City of Vermillion	??	Jun-10	$ 45,000	Powerline
	West River Electric	Steel Structures	Jun-13	$ 1,500	Substation
		Distribution Switches			
	East River Electric	SF6 Circuit Breaker	Sep-13	$ 9,500	Substation
		Charger			
		3 Voltage Regulators			
		Insulators			
	Northwestern Energy	30 Gas meters	Oct-14	$ 3,000	PNG
	Central Electric in Mitchell	Underground and overhead conductors for power line	Jan-15	$ 250	Substation
	Northwestern Energy	Oil Circuit Breaker	Feb-15	$ 1,500	Substation
		Steel Structures			
		Fiberglass Switching Sticks			
	Sioux City Energy Coleman, SD	Oil Circuit Recloser Control Panel	Feb-15	$ 1,200	Substation
	Northwestern Energy	Aluminum Substation metal; switches; insulators; wire	Apr-15	$ 4,000	Substation
	Central Electric Coop	Wire	Apr-15	$ 400	Powerline
	Excel Energy	4 115 KV SF6 Breakers	Not yet		Substation
	Central Electric	3000 ft URD wire ($1.98/ft)	Sep-15	$ 5,940	Powerline
	Central Electric	Cross Arms 75	Sep-15	$ 800	Powerline
	West Central Electric	Used Digger Truck	Sep-15	$ 15,000	Powerline
	Transcanadian Oil Pipeline	2 Cirucuit Breakers	Sep-15	$ 40,000	Substation
	Blattner energy	Truckload of Misc Equip	Oct-15	$ 100,000	Substation
	Excel Energy	2 115kv circuit Breakers	Q4 2015	$ 100,000	Substation
	Groebner & Assoc	2 Sensits Comb Gas Detectors	Q4 2015	$ 4,000	PNG
	Laminated Wood Syst	Cost reduction on 4 laminate poles	Q1 2016	$ 30,000	Substation
	East River Elect	69KV gang operated air break switch	Q1 2016	$ 1,000	Substation
	Northwestern Corp	Steel & Aluminum parts	Q1 2016	$ 17,900	Substation
	Jerry's Electric	30 pole top & 8 pad mount transformers	Q2 2016	$ 7,600	PL
	Jerry's Electric	9 Type L reclosers	Q2 2016	$ 1,000	Substation
	Northwestern Energy	10 poles, 6 regulators; 2 reclosers;	Q2 2016	$ 5,000	Substation
	Northwestern Energy	2007 Intl Truck with all-tech digger	Q2 2016	$ 18,000	Substation
	Black Hills Energy	4 MVAR Capacitor Bank & 11 reclosers	Q3 2016	$ 10,000	Substation
	Addison Construction	Two 15 KV Power Circuit Breakers	Q4 2016	$ 2,000	Substation
	Larson Trailer Sales	Reel Truck	Q4 2016	lease a $30,000 for $3000	PL