

SCC GIS.PA

MAPPING NEW CAREERS IN GEOSPATIAL TECHNOLOGIES

Project Final External Evaluation Report *As of September 12, 2017*



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MNCGT FINAL EVALUATION REPORT

This is the final external evaluation report for Mapping New Careers in Geospatial Technologies (MNCGT). It includes both qualitative and quantitative analyses for this point in the project, which is cumulative to the efforts and progress to date. It was created by the external evaluation team of Dr. Michael Shain and Dr. Neal Grandgenett with the periodic assistance of the Project Manager, Ms. Joanie Houti, her staff and Southeast Community College Instructors and Administrators.

1.0 Title and Abstract

1.1 Title

The full title of the MNCGT evaluation is “Mapping New Careers in Geospatial Technology at Southeast Community College.” This document represents cumulative information within the context of the original evaluation plan and project proposal as approved by Trade Adjustment Assistance Community College and Career Training (TAACCCT) through the U.S. Department of Labor (DOL).

1.2 Abstract and Report Overview

MNCGT, as a TAACCCT DOL-funded initiative, sought to increase the achievement of certificate through blended learning combined with experienced instructors, advanced labs, and modern technology in the context of new curricula and instructional innovations related to the Precision Agriculture (PA) and the Geographic Information Systems (GIS) programs.

Project MNCGT Business Engagement

The MNCGT project included numerous business partners that work closely with Southeast Community College (SCC) in leading the grant efforts. Together these partners sought to expand and to improve education and career training programs for workers eligible for U.S. Trade Adjustment Assistance (TAA), veterans, unemployed and underemployed workers, and traditional students.

The Purpose of this External Evaluation

The purpose of this external evaluation was to assess the effectiveness of the Precision Agriculture (PA) and Geographic Information Systems (GIS) curricula and support services in training a diverse set of participants to pass community college certificates, earn diplomas and meet Associate of Applied Science (AAS) requirements and certificates to qualify and acquire high skill, high wage and high need employment in either PA or GIS fields. The participating community college in the state of Nebraska is a two-year college operating in the 2013 – 2017 academic years. Adults eighteen (18) and older who participated in certificate courses were considered as part of the student-related data and the MNCGT Intervention data.

Evaluators

Evaluation planning was facilitated by a duo of research professionals who have demonstrated expertise for numerous project evaluations: Dr. Michael Shain, President of Shain Evaluation & Consulting, LLC, and Dr. Neal Grandgenett, STEM Professor and Haddix Community Chair of STEM Education with the University of Nebraska at Omaha (UNO). Both have successful experience providing evaluation studies for a wide range of federally funded grant projects, including the US Department of Labor (DOL), National Science Foundation (NSF), and the US Department of Education (DOE). Dr. Shain has extensive evaluation experience with federal workforce training projects, through private practice and a decade of service as the Director of Evaluation Services at the Applied Information Management (AIM)

Institute. Dr. Grandgenett shares strong federal grant evaluation experience, with an emphasis on Science, Technology, Engineering, and Mathematics (STEM) instruction, problem-based learning, and technology-enabled workforce training, having more than 130 publications related to STEM learning and program evaluation. They have several years' experience working collaboratively on project evaluation, with Dr. Shain's focus on qualitative analyses and Dr. Grandgenett's focus on quantitative analyses. Drs. Shain and Grandgenett had no financial interest in the outcome of the evaluation; they were not involved with the development of the project, and did not have any affiliation with the management of the grant, consistent with DOL guidelines.

Sample

Eligible adults (18 and older) that participated in one/all of the Precision Agriculture (PA) and/or Geographic Information Systems (GIS) courses and related activities and resources represented the sample.

Evaluation Design

The evaluation design was a longitudinal quasi-experimental, mixed method study from a statistical approach; included also were limited comparison strategies for students who completed a program certificate of study with those who completed only sections of the PA or GIS certificates or had initially considered it with an entry survey. In addition, a case study format was utilized to ascertain innovative approaches to curriculum, instruction and support services; the potential impact on program sustainability, the department, the overall community college system, and business interactions were also addressed. Data were retrieved before, during and after the PA or GIS interventions.

Data Collection and Analysis

The Data Collection and Analysis related to a focused analysis of the demographic, academic and participation data that were collected from the records of the community college, through the Project Manager and staff; all quantitative data were entered into an SPSS (Statistical Package for the Social Sciences) spreadsheet for analysis. Regarding employment, wage and retention data, aggregates of social security numbers of participants were sent to the Nebraska Department of Labor (NDOL) through the college's institutional research department to obtain these data. For qualitative data, a case study was collected through a series of quarterly interviews of the community college's PA and GIS staff and related support staff. The qualitative data were analyzed using pattern analysis techniques. In addition, the staff and affiliated community college personnel completed semi-annual services reports related to the progress of the program.

Project Findings

The findings represented later in the report were associated with the community college addressing the introduction, development, and potential sustainability of the GIS and PA curricula according to their individual program cultures. The college has integrated both of the curricula into the college's existing programs. The project was able to meet the number of participants as required by the TAACCCT grant program at the U.S. Department of Labor. The external evaluation study also generated a set of lessons learned for future community colleges to integrate innovative coursework and ancillary support into the culture of the college.

Conclusions

Later in the report, the document describes that the underlying premises of the Precision Agriculture (PA) and Geographic Information Systems (GIS) Certificate programs as delineated in the accepted proposal and implemented by the community college. Curricula were developed and implemented, and the college has sustained both programs. Innovative instructional resources and student services were implemented and proved successful.

2.0 Background and Purpose

2.1 Unique Setting of the College

Southeast Community College (SCC)

Southeast Community College is a two-year public institution of higher education serving a primary area of 15 counties in southeast Nebraska. SCC offers multiple locations and continues to expand its online opportunities. With career/technical and academic programs, SCC provides students with opportunities to create their futures through the obtainment of new knowledge, skills and awareness. The blend of career/technical programs will provide students with the skills necessary to be successful in the workforce. SCC's programs provide students with opportunities to work with the latest equipment and technologies. Students enrolled in career/technical programs also receive high-quality instruction in academic areas to ensure they have both the technical and academic skills necessary to succeed at different organizational levels and in a variety of dynamic work environments. The first two years of a four-year degree represent the essential academic foundation. SCC's Academic Transfer program provides students with an outstanding opportunity to obtain a high-quality academic foundation at very affordable rates.

2.2 Timeline

Within the timeline of the MNCGT funding, the program received funding beginning October 1st, 2013. The first step was to hire a Project Manager, who in turn hired the necessary staff: PA and GIS curricula developers, PA and GIS Instructors, support personnel, and a Recruiter/Success Coach. As the various staff were hired, the Project Manager and curriculum developers began work to develop course sequences for both PA and GIS curricula, the framework for a coaching model ("proactive coaching"), resources closely correlated to the content standards, and the necessary equipment and supplies. In addition, various outreach "tools" (an electronic presence; brochures and flyers; presentations, PSAs; etc.) were also undertaken. Partnerships were quite varied and included a range of partners in the PA and GIS pipelines (University of Nebraska-Lincoln; Nebraska Departments of Labor; Economic Development, and Education), as well as businesses and industries in the college's service area. A two-person evaluation team utilized a developmental evaluation approach (both qualitative: case study, site visits, curriculum reviews and surveys; and quantitative: the nine TAACCCT required data points, a quarterly updated SPSS spreadsheet of all data; and quarterly feedback to the Project Manager and staff).

2.3 Background Information on the MNCGT Intervention

Southeast Community College (SCC) developed and implemented a four-year Trade Adjustment Assistance Community College and Career Training (TAACCCT) Department of Labor (DOL) funded project to expand and improve the ability of the college to deliver education and career training programs to workers eligible for U.S. Trade Adjustment Assistance (TAA), veterans, unemployed and underemployed workers, and traditional students. The project sought to increase attainment of educational certificates through the use of innovative and effective methods of curriculum development and delivery via the new *Precision Agriculture and Geographic Information Systems* programs.

TAA-eligible workers are generally older individuals (avg. 48 years of age) who were long-tenured in their previous job (avg. 13 years) and have basic skills (82% with high school or GED). However, most possess "on-the-job" skills that are not well documented or transferable. In addition, TAA-eligible workers have unique barriers to training and re-employment programs which are typically designed for younger workers with higher levels of adult basic education.

There is also a significant opportunity for resources developed and delivered to be introduced to younger student populations. Young adults and traditional college students will have the opportunity to see and

learn about Precision Agriculture and Geographic Information Systems, gain college credit and earn nationally-recognized industry certificates.

2.4 Project Work Plan

The following work plan fundamentals or “priorities” were related to the project proposal and helped to organize the project’s general work efforts.

- **Priority 1**—Provide effective grant management and administration to achieve grant deliverables.
- **Priority 2**—Develop PA and GIS certificates that are stackable and latticed and align with industry association standards.
- **Priority 3**—Incorporate innovative learning opportunities, including options for online learning and collaborations.
- **Priority 4**—Improve retention and completion by providing knowledge, skills, abilities, and assessments and enhanced coaching services.
- **Priority 5**— Develop pathways to baccalaureate programs with four-year institutions.

2.5 Key PA and GIS Curricula Deliverables

The key curriculum-related deliverables associated with the project were established to help the project to consistently refine the MNCGT related instruction. The first was a *Precision Agriculture Certificate*, with courses aligned with the existing agriculture programs and agricultural needs in Nebraska. Next was the development of a variety of digital resources. Third was an enhanced recruitment/success coaching model to reduce attrition and accelerate progress toward achieving each student’s success. Fourth was to facilitate the articulation of at least twenty-five percent (25%) of GIS and PA courses with two (2) articulated pathways to four-year baccalaureate programs. MNCGT was seeking an increase in participant retention and completion rates compared to other programs in the community college system.

2.6 Targeted Outcomes

The project worked toward a series of specific outcomes as detailed by the U.S. Department of Labor. These outcomes included the following.

Cumulative Participant Outcomes

1. Unique Participants Served/Enrollees
2. Total Number Who Have Completed a Grant-Funded Program of Study
 - 2a. Total Number of Grant-Funded Program of Study Completers as 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)
 - 6b: Total Number of Students Earning Certificates - More Than One Year (aggregate)
 - 6c: Total Number of Students Earning Degrees (aggregate)
7. Total Number Pursuing Further Education After Program of Study Completion
8. Total Number Employed After Program of Study Completion
9. Total Number Employed After Retained in Employment After Program of Study Completion
10. Total Number of Those Employed at Enrollment Who Receive a Wage Increase Post-Enrollment

3.0 Research Questions of the Evaluation Study

The MNCGT program is designed to increase attainment of education and industry-recognized certificates through the use of innovative and effective methods of curriculum development and delivery. The evidence-based method will demonstrate improved employment outcomes as a result of the training activities and interventions. MNCGT will employ innovative assessment, training, and re-employment strategies that will reduce training program attrition and provide higher-skilled, higher-earnings employment outcomes. Specifically, MNCGT will develop several PA-related and GIS-related credentials that individually will improve near-term reemployment, and collectively be stacked toward a 2-year or 4-year technical or professional degree.

3.1 Key Outcome Evaluation Questions

1. To what extent does the project increase attainment of certificates, diplomas, and other industry-recognized credentials to better prepare TAA-eligible workers and other adults for high-wage, high-skill employment or re-employment in growth industry sectors?
2. To what extent does the project introduce innovative and effective methods for curriculum development and delivery that address specific industry needs and leads to improved learning outcomes and retention rates for eligible participants?
3. To what extent does the project demonstrate, for TAA-eligible workers in particular, improved employment outcomes as a result of the funded program?

3.2 TAACCCT Research Questions

1. What service delivery and/or system reform innovations resulted in improved MNCGTs for participants?
2. Under what conditions can these innovations most effectively be replicated?
3. What are the types of emerging ideas for service delivery change and/or system reform that seem the most promising for further research? Under what conditions are these ideas most effective?
4. What directions for future research on the country's public workforce system, and workforce development in general, were learned?

3.3 Implementation Analysis Research Questions

1. How was the curriculum selected, used, and/or created to undertake the project intervention and how does it appear to be developing?
2. How were related courses, programs and program designs improved or expanded using grant funds? What delivery methods were offered? What was the program administrative structure? What support services and other services were offered?
3. What contributions did each of the partners (employers, workforce system, other training providers and educators, philanthropic organizations, and others as applicable) make in terms of program design, curriculum development, recruitment, training, placement, program management, leveraging of resources, and commitment to program sustainability? What factors contributed to partner involvement or lack of involvement in the program? What contributions from partners were most critical to the success of the grant program? Which contributions from partners had less of an impact?
4. Was an in-depth assessment of participants' abilities, skills and interests conducted to select participants into the grant program and to facilitate a project comparison group? What assessment

tools and processes were used? Who conducted the assessment? How were the assessment results used? Were the assessment results useful in determining the appropriate program and course sequence for participants? Was career guidance provided, and if so, through what methods?

5. Contextually, how are the program implementation components generally aligned with the nine required TAACCCT program indicators?
6. How will the evaluation team discover, and the team respond to, unanticipated outcomes of the Project MNCGT program, both positive and negative?
7. How efficacious are the program interventions being undertaken (defined as “the power to produce a desired result or effect”)?

4.0 Methods—Mixed Methods Data Analysis Approach

The methods of the evaluation process are now described from both a qualitative and quantitative context. It is important to note that the evaluation methodology was specifically tailored to the context and processes of the grant efforts, and that the evaluation team worked closely with the project leadership team in making sure that the project evaluation aligned with the project activities and efforts.

4.1 Qualitative Methodologies

Developmental Evaluation

According to Michael Quinn Patton, “Developmental Evaluation supports innovation development to guide adaptation to emergent and dynamic realities in complex environments. Innovations can take the form of new projects, programs, products, organizational changes, policy reforms, and system interventions. A complex system is characterized by a large number of interacting and interdependent elements in which there is no central control. Patterns of change emerge from rapid, real time interactions that generate learning, evolution, and development – if one is paying attention and knows how to observe and capture the important and emergent patterns. Complex environments for social interventions and innovations are those in which what to do to solve problems is uncertain and key stakeholders are in conflict about how to proceed.” Patton (2006) explains the differences between traditional and developmental evaluation. A summary version of these differences is presented on the next page:

Traditional evaluation	Developmental evaluation
Purpose: Supports improvement, summative tests and accountability	Purpose: Supports development of innovation and adaptation in dynamic environments
Roles & relationships: Positioned as an outsider to assure independence and objectivity	Roles & relationships: Positioned as an internal team function integrated into the process of gathering and interpreting data, framing issues, surfacing and testing model developments
Accountability: Focused on external authorities and funders based on explicit and pre-ordinate criteria	Accountability: Centered on the innovators' values and commitment to make a difference
Options: Rigorously options-focused, traditional research and disciplinary standards of quality dominate	Options: Utilization focused: options are chosen in service to developmental use
Measurement: Measure performance and success against pre-determined goals and SMART outcomes	Measurement: Develops measures and tracking mechanisms quickly as outcomes emerge; measures can change during the evaluation as the process unfolds
Evaluation results: Detailed formal reports; validated best practices, generalizable across time and space. Can engender fear of failure	Evaluation results: Rapid, real time feedback; diverse, user-friendly forms of feedback. Evaluation aims to nurture learning
Complexity & uncertainty: Evaluator tries to control design implementation and the evaluation process	Complexity & uncertainty: Learning to respond to lack of control; staying in touch with what's unfolding and responding accordingly
Standards: Methodological competence and commitment to rigor, independence; credibility with external authorities and funders; analytical and critical thinking	Standards: Methodological flexibility eclecticism, and adaptability; systems thinking; creative and critical thinking balanced; high tolerance for ambiguity; open and agile; teamwork and people skills; able to facilitate rigorous evidence-based perspectives

Figure 1. Differences Between Traditional and Developmental Evaluations

Because of the fluid nature of both PA and GIS related fields, a Developmental Evaluation approach was selected, with qualitative data being gathered from a variety of sources: quarterly interviews with the Project Manager and staff (see appendix for full write-ups), annual full staff meetings with all MNCGT personnel, curriculum review sessions took place within the context of larger group meetings as well as within smaller meetings of the evaluation and leadership teams. In addition, the evaluators examined quarterly and annual TAACCCT reports, as well as and surveys of all personnel and students (see appendix for survey and results). Feedback was given to the Project Manager, with the opportunity to add additional detail or revise the case study for accuracy's sake.

Case Study

A case study focuses on a particular unit—a person, a site, or a project. It often uses a combination of quantitative and qualitative data. Case studies can be particularly useful for understanding how different elements fit together and how different elements (implementation, context and other factors) have produced the observed PA and GIS outcomes. There are different types of case studies, which can be used for different purposes in evaluation. The Government Accountability Office (GAO) has described six different types of case studies:

1. **Illustrative:** This is descriptive in character and intended to add realism and in-depth examples to other information about a program or policy. (These are often used to complement quantitative data by providing examples of the overall findings).
2. **Exploratory:** This is also descriptive but is aimed at generating hypotheses for later investigation rather than simply providing illustration.
3. **Critical instance:** This examines a single instance of unique interest, or serves as a critical test of an assertion about a program, problem or strategy.
4. **Program implementation:** This investigates operations, often at several sites, and often with reference to a set of norms or standards about implementation processes.
5. **Program effects:** This examines the causal links between the program and observed effects (outputs, outcomes or MNCGTs, depending on the timing of the evaluation) and usually involves multi-site, multi-method evaluations.
6. **Cumulative:** This brings together findings from many case studies to answer evaluative questions.

The qualitative evaluation of MNCGT blends program implementation, program effects and cumulative aspects of case study, looking at all three elements: implementation, effects and cumulative data from the community college's approaches to PA and GIS. The case study not only gathered data on the development and implementation of the activities, services and resources of the project, but also how they emerge into the individual culture (defined as "how we do business") of the institutions. The process of "Pattern Analysis" was utilized to glean out the consistencies that were shown to improve student learning, as well as those activities, services and resources that showed little impact on student success (Stufflebeam, 2007 & Fitzpatrick, 2004). These qualitative data were triangulated with a survey of the PA and GIS staffs in the community college. (see appendix).

4.2 Quantitative Methodologies

Description of the Study Sample

The participants in the study were adults eighteen and over that enrolled in Southeast Community College and were seeking courses, certificates, or diplomas related to Precision Agriculture (PA) or Geographic Information Systems (GIS). The primary study sample must have at least one of the PA or GIS courses, while priority analysis was given to 3 or more courses completed.

Description of Comparison Group

The participants in the study who were designated as part of the comparison group were adults eighteen and over that enrolled in the community college and were also seeking courses, certificates or diplomas related to PA or GIS. However, they did not complete one of either sequence of courses.

Specific Characteristics of the Intervention(s)

The PA and GIS Certificate programs utilized a variety of interventions to insure effective instruction, timely services and targeted resources. The classes were offered in a variety of ways, from the traditional classroom and lab format, to a "hybrid" of online and classroom/lab. To support the curriculum, "success" coaching was introduced to great effect, assisting students in navigating their way through the college system and assisting with personal/social, financial, academic and job-related issues. The MNCGT staff used a myriad of approaches to recruit students into the PA or GIS Certificate programs. From a personal standpoint, they presented at career fairs, local/regional workshops and conferences, and through PSAs and other outreach events; the instructors talked with current students about adding the PA or GIS Certificates and solicited students to talk to their friends and relatives and neighbors about the

opportunities in the MNCGT programs. They developed and maintained online components and kept a strong online presence. They designed and disseminated brochures, flyers and posters.

Description of Staff Sample

MNCGT had an overall Project Manager housed at the Continuing Education Center at Southeast Community College (SCC). The project also had several instructional and support personnel providing coaching and remediation for math and reading/writing issues. One of the difficulties with program continuity was the level of turnover among Project Managers. A full-time Project Manager wasn't hired until several months into the program; in mid-August, 2015 the initial manager moved into a new position at SCC, which required the hiring of an interim manager. After a short gap, a full-time Project Manager was hired. In addition there was a turnover of PA Instructors. However the transitions were managed effectively and in close coordination with the college administration. (See Personnel Chart below)

MNCGT Project Staff	
Project Personnel	Position Title
Dennis Headrick	Vice President Instruction
Kenton Baughman	Associate Dean of Agriculture
Glenn Pasho	Dean Const./Elec/Comm./IT
Rachael Hoagland	Project Manager (July 14 th , 2014 – August 3 rd , 2015)
Beth Vavrina	Project Manager (August 4 th , 2015 – November 15 th , 2015)
Joanie Houti	Project Manager (Apr. 12, 2016 - Sept. 30, 2017)
Phip Ross	Coordinator of Transitions Lab
Laureen Greenwood	Instructional Designer (until September 3 rd , 2015)
Annie Erichsen	Precision Ag Instructor
Katrina Patton	GIS Instructor
Seeking New Instructor	Precision Ag Instructor
Mary Mach	Transition Advisor (Beatrice)
Emma Plese	Transition Advisor (Milford)
Shannon Brinkman	Transition Advisor (Lincoln)
Nancy Heller	Administrative Assistant
Chelsey Thorpe	Recruiter/Success Coach (PA)
Larry King	Placement Specialist (GIS)
Rachael McLeod	Resource Development Director (Grant Closeout)
Audra Podliska	Resource Development Specialist (Grant Closeout)

5.0 Data Analysis Basic Results Summary

5.1 Indicators of Impact and Study Fidelity

“Fidelity, also referred to as adherence, integrity and quality of implementation, is the extent to which the delivery of an intervention adheres to the protocol or program model as intended by the developers of the intervention.” (Dane and Schneider, 1998) There are five dimensions of fidelity: adherence, exposure, quality of delivery, participant responsiveness and program differentiation. As the data and descriptions throughout this report delineate, MNCGT has met the five criteria:

- **Adherence** (extent to which the program components are delivered): a comparison of the work plan and priorities to the actual work accomplished by PA and GIS staff and partners matches closely (See Section 5.3 Qualitative Data Summary)
- **Exposure** (amount of program delivered in relation to the amount prescribed in the program model): MNCGT met the designated number of participants (See Section 5.2 Quantitative Data Summary)
- **Quality of delivery** (manner in which the program is delivered): MNCGT delivered a number of high quality components, such as the curriculum, the success coaching, the use of functional technologies, innovative instructional practices, etc.) (See Section 6.0 Evaluation Results Discussion)
- **Participant responsiveness** (manner in which the participants . . . engage in the program): MNCGT offered a number of innovative options for student engagement, from informational opportunities to fully completing the GIS or PA Certificates. (See Sections 5.2 Quantitative Data Summary and 5.3 Qualitative Data Summary)
- **Program differentiation** (degree to which the critical components are distinguishable . . . from other programs): MNCGT designed and implemented both a PA and a GIS program featuring five (5) distinct courses related to GIS and six (6) distinct PA courses plus a math course (See course titles in Appendix). Southeast Community College implemented the programs to integrate with their culture, creating the approaches to the PA and the GIS Certificate.

5.2 Quantitative Data Summary

The participant outcomes and overall project impact data were derived on a quarterly basis from the community college which completed quarterly reports, sent routine updates on a coded data spreadsheet, and provided various descriptive measures. The data summaries are extensive in the full report, and only some basic highlights are presented in the following summary bullets.

Basic Demographics of Study Sample at End of Project

The following are the demographic variables summary at the current time (end of the project) related to MNCGT, and represents the data that was shared by the project with the external evaluation team.

- Total of Student records in SPSS file: N = **333**
- Gender Totals: Male **260**; Female: **73**
- Race Totals: White **327** (Hispanic **3**); Black **3**; Asian **2**; Two or More **1**
- Veteran Totals: Veterans **19** (Spouse **1**)
- Age Mean: **23.4** years (Range: **17-66** years; Standard Deviation: **9.0** years)

Student Participation by Program Designation

The following table summarizes student participation by program designations.

Quantitative Table 1. Student Participation in Program

Program Designation	
Intervention	198
Control	135
GIS	58
LSCE	1
Other	173
PA	88
PA/GIS	1
Blank	12
Full-Time Student	264
Part-Time Student	63
Blank	6

Quantitative Table 2A. Student Participation in Courses

Courses	N
GIST 1110	63
GIST 1120	44
GIST 1130	28
GIST 1140	19
GIST 1900	4
GIST 1901	16
Math 1050	38
GEOG 1400	38
AGRI 1131	260
AGRI 1153	235
AGRI 1171	257
AGRI 2279	165
AGRI 2295	81
AGRI 1172	104
Math 1040	117
AGRI 1205	250
AGRI 1216	252

Quantitative Table 2B. Student Participation in Cohorts

Cohort Designation	N
Cohort 1	43
Cohort 2	48
Cohort 3	63
Cohort 4	13*
Cohort 5	30
Cohort 6	62*
Cohort 7	31
Cohort 8	8*
Cohort 9	15
Cohort 10	12
Cohort 11	8

Note: Enrollments often coincides with demands of planting seasons. For example, Cohort 4, Spring Quarter was lower since Ag enrollees typically participate in family farm planting; Quarter 6, Winter Quarter harvest work is finished and thus Ag enrollees have a higher number that quarter; Quarter 8, Spring Quarter, Ag enrollees again participate in family farm planting.

Students participated in the Precision Agriculture (PA) and Geographic Information Systems (GIS) programs appropriately across a wide range of courses and services that allowed the integration of the PA and GIS courses into the institutional framework at Southeast Community College (SCC).

Employment Status Upon Enrollment

As with most all community colleges across the country, many different types of students attended within the context of the PA and GIS programs. When looking at their employment status upon enrollment in both programs the following table represents the context.

Quantitative Table 3. Student Employment Status Upon Enrollment in PA or GIS

Student Employment Status	N	Percent
Full time	57	17.1%
Part time	184	55.3%
Self-Employed	27	8.1%
Unemployed or No Employment	65	19.5%
Totals	333	100.0%

Additional Status Documentation

As consistent with guidelines from the Department of Labor, additional status on the areas of TAA and Disability for each student was also recorded.

Quantitative Table 4. TAA Status

Status	N	Percent
Don't Know	275	82.6%
Not Eligible	33	9.9%
TAA Enrolled	1	0.3%
Blank	24	7.2%
Totals	333	100.0%

Quantitative Table 5. Disability Status

Status	N	Percent
No	231	69.4%
Yes	10	3.0%
Blank	92	27.6%
Totals	333	100.0%

The status related to program average credits were also collected. It is important to note that at the time of this report, some students were in progress and thus the credits were varied by program status.

Quantitative Table 6. Total Credits GIS

Total Credits Variable	Statistic
Sample Size	333
Mean	3.78
Standard Deviation	7.85
Min	0.00
Max	31.5

Quantitative Table 7. Total Credits PA

Total Credits Variable	Statistic
Sample Size	333
Mean	23.15
Standard Deviation	13.58
Min	0
Max	40.5

Additional Results Associated with Observed Outcome Relationships

The overall outcomes observable from the quantitative data are associated with the following tables. The project established an innovative new coaching model. The majority of students in the reporting spreadsheet participated at least once per month in the coaching.

Quantitative Table 8. Success Coaching Contact with Students

Regular Contact with a Coach	N
Transitions Lab	15
Recruiter/Success Coach	42
Placement Specialist	6
<i>Surveys/Phone Calls</i>	270

Outcomes: Community College Certificates

The project sought to assist students to get a related community college certificate within the process of participating in the GIS and PA programs. Many of the SCC students are in the process of completing certificates.

Quantitative Table 9. Community College Certificate Completion Status

Community College Certificate Completion Status	N
Certificate in GIS	16
Certificate in PA	65
Total Certificates Awarded	81*

**5 students opted out on the intake form; and 5 students did not sign form, that would have increased the Completer total to 91, closer to the goal of 100.*

Quantitative Table 10. Program Degree Earned

Community College Degree Status	N
AA Academic Transfer	1
AAS Ag Bus & Mgmt	121
AAS ARCH	1
AAS Bldg Constr	1
AAS Business Administration	2
AAS CADD	2
AAS Land Surveying	1
AAS Weld Tech / Ag Bus & Mgmt Tech	1
AS Academic Transfer	1
Totals	131

It is important to note that many students continue to be in process and the outcomes are continuing to be updated. The program has endeavored to continue to articulate and seek compatibility of the program course offerings across the full range of possible SCC academic programs.

Quantitative **Table 11. Community College Certificate Achieved**

Community College Certificates Achieved	N
No	168
Yes	81
<i>In Progress/Blank</i>	84
Totals	333

Quantitative **Table 12. Associate of Arts Degree Achieved**

Student Achieved AA Degree	N
No	118
Yes	131
<i>In Progress/Blank</i>	84
Totals	333

It is difficult to tell when a student actually leaves the community college environment, since many students are appropriately lifelong learners and come back to an institution for additional technical training or certificate opportunities.

Quantitative **Table 13. Employment Status After Leaving PA or GIS Program**

Record of Employment Status on Exit	N
No	40
Yes	25
N/R (Not required for Incumbent workers)	268
Totals	333

Note: Outcome B.8 is only about non-incumbent worker (If they were unemployed at the start and then did get a job offer after completing the certificate program). There are 65 non-incumbent workers and 268 incumbent workers who had jobs when they started.

The available wage data for a sample of students across the PA and GIS programs was available by post-graduation survey. The data were secured by the college modifying its regular post-graduation survey, or from having contact with a coach that followed up with the student. The wage information is provided in the following table and figure.

Quantitative Table 14. Wage Increase (Follow-Up Contacts)

Student Achieved AA Degree	N	Percent
No	139	41.7%
Yes	74	22.2%
N/R	65	19.5%
N/A	55	16.5%
Totals	333	100.0%

Note: Outcome B.10 participants employed at enrollment who received a wage increase post-enrollment. This question only pertains to the 268 incumbent workers. The N/R are the 65 non-incumbents; this does not pertain. The N/A are follow-up outcomes we are still trying to get answers from.

Quantitative Table 15. Wage Data

Wage Hourly	Statistic
Sample	214
Missing	119
Mean	\$12.01
Standard Deviation	\$6.70
Min	\$1.44
Max	\$62.50

5.3 Qualitative Data Summary

Case study data were gathered during quarterly site visits with the college. The external evaluator utilized a nine (9) point agenda when interviewing the site coordinators and participant coaches at the respective colleges. The interviews were taped, with the only person having access to the tapes was the evaluator, who reviewed the tapes, taking notes and translating them into a quarterly series of narratives. The external evaluators also asked what extra assistance the staff might need from them and any “final thoughts,” but those responses will not be included in the following narrative.

Management Structure/HR

One of the keys to the successful development and implementation of the Precision Agriculture (PA) and the Geographic Information Systems (GIS) certificate programs at the community college was the selection of a “Champion” who could focus exclusively on managing the various facets of the two separate programs. The college was successful at this key item, with a seamless “handoff” from the initial Project Manager to the new manager. The Project Manager worked closely with the Deans of both of the programs, with the Instructors in both PA and GIS, with the support staff at SCC Finance, HR, Data Center, and Transitions Lab Coaches. In addition the Project Manager and staff maintained an open communication process with the External Evaluators to provide direction and information on a timely basis.

Curriculum/Course Development and Implementation/Instructional Resources

An Instructional Designer (ID) was hired to develop the overall curriculum including the five (5) courses for the Geographic Information Systems (GIS) program; another instructional designer/instructor was hired to develop the curricula and coursework for the Precision Agriculture (PA) program. Each curricula included the appropriate, innovative and functional instructional resources. The IDs fully developed the

syllabi, with course descriptions, objectives, lesson plans and assessments. They were adopted and in some cases adapted to meet the guidelines the community college had regarding curriculum. The college completely fleshed out the courses and passed them through their educational service departments and on to the Nebraska Post-Secondary Coordinating Commission. The PA Certificate was approved by the Commission. The GIS courses merged the certificate into existing Land Surveying AAS. The GIS Technician Certificate is also an option (see course requirements below). The GIS courses are all online; the PA courses are “hybrids,” with some content via the internet and some more “hands-on” with lab and field work. Both courses in the PA and the GIS programs are continuously updated by the Instructors as new content and new instructional modes are developed. The GIS Instructor has even developed a “wish list” of new courses (See Appendix 6). A GIS General Education (Gen Ed) course was developed and will be considered in the future. The college developed a “latticed” and “laddered” approach to the courses and the Certificate, allowing students to build from a certificate to a diploma to an AAS degree. It was hoped that this developmental approach would seamlessly be accepted for a Bachelor’s degree at one of the state colleges or universities. However, most would accept the courses merely as electives. The curriculum was reviewed by outside curriculum experts and experts in the field of PA and GIS as part of the initial DACUM (Development of Curriculum).

GIS Technician Certificate Core Courses

A grade of “C” or higher in all program classes is required to progress through the program.

Course # Course title Credit hours

- GIST1110 Introduction to Geospatial Technology 4.5
- GIST1120 Spatial Analysis and Modeling 4.5
- GIST1130 Data Acquisition and Management 4.5
- GIST1140 GIS Capstone 4.5
- GIST1900 Internship or
- GIST1901 Cooperative Experience 4.5

Total: 22.5 hours

Precision Agriculture Certificate Core Courses

- Course # Course title Credit hours
- AGRI1131 Crop & Food Science 4.5
- AGRI1153 Soils & Plant Nutrition 6.0
- AGRI1171 Ag Technology 3.0
- AGRI1172 Ag Precision Hardware 4.5
- AGRI2279 Precision Technology 4.5
- AGRI2295 Advanced Precision Technology 4.5

Total: 27.0 hours

Recruitment/Success Coaching and Placement

The Project utilized full or part-time recruiter/success coaches to assist students in a variety of ways, functioning as a “wrap-around” service. They provided support academically, career/job-wise and from a personal/social standpoint. They helped students navigate their way through the various systems that might otherwise stymie them. One example was during Advising Days; when students were enrolling, the instructors, the advisors and coaches from the Transitions Lab (T-Lab) were all in the same room. If any of the potential students had questions or if they were thought to require academic assistance, the T-Lab coach was there to lend support. This “wrap-around” service also assisted with enrollment, course selection, tutoring (or helping them find a tutor), seeking financial aid, trouble-shooting with them on

transportation dilemmas, and more personal concerns. They served as “guides-on-the-side” for a number of students. The Recruiter/Success Coach with the Precision Agriculture (PA) program worked with students to help them complete the certificate program; The Placement Specialist with the Geographic Information Systems (GIS) program functioned more as assisting completers in securing employment.

Dr. Paul Illich-President, Southeast Community College, stated the following:

“In July 2015, the College implemented its 2015-19 Strategic Plan: Creating Futures through Inquiry, Knowledge and Application. This plan provides SCC with a roadmap to ensure the College focuses on meeting student and employer demand for higher education. The plan emphasizes SCC’s student-centered focus through positive and engaging learning environments and comprehensive support services. SCC is committed to student success in the workforce and in higher education settings. The College believes that learning extends beyond the classroom and specific academic content. SCC students will have opportunities for personal and cultural enrichment through wellness programming, global and diversity education, field experiences, research initiatives, and many other challenging and engaging endeavors.”

Data Collection Process

As stated earlier, the External Evaluators have utilized a developmental evaluation approach, with a Quasi-Experimental mixed method study. Qualitative data were gathered using a case study approach, with quarterly site meeting, supplemented with a survey of MNCGT staff and other personnel associated with the program, and annual Advisory Committee meetings. Quantitative data were collected through the site coordinator and placed into an SPSS spreadsheet for analysis. In addition, formative curriculum review conversations were conducted by the External Evaluators that including utilizing experts in curriculum and in Precision Agriculture and Geographic Information Systems.

Recruiting and Outreach

The Project Manager and staff developed and implemented a variety of outreach and recruiting “tools.” They designed and disseminated brochures, posters and flyers. They presented at local and regional gatherings, such as career fairs, job placement events, conferences and other places where perspective participants and/or potential employers might gather. The Project staff developed and maintained an electronic presence including posting on social media (FaceBook, SnapChat, etc.). They also worked internally with the college’s admissions, student services and counseling departments to make them aware of the certificate programs. Finally, they used the most effective methods of recruiting: word-of-mouth, with instructors, students already in the program, PA and GIS staff and employers who have hired graduates talking to individual perspective students, students already enrolled in other departments who are seeking other options, and basically anyone who is seeking training that would lead to a greater opportunity for employment. The latter proved most effective in recruiting.

Partnerships with Business, Government and Education

The Project Manager and staff worked with the agricultural and GIS agencies to build internship opportunities and/or recruitment partnerships. They collaborated with Workforce Development offices, human service agencies, alternative education programs, and individual large and small businesses to provide information and training opportunities. They also worked with governmental agencies, including the Nebraska Department of Economic Development (NDED), the Nebraska Department of Education (NDE), and the Nebraska Department of Labor (NDOL). They met semi-annually with advisory committees to discuss the latest developments in Precision Agriculture and Geographic Information Systems.

Program Integration/Sustainability

Program sustainability and scaling was brought up early and often by the external evaluation team and the Project Manager. The Precision Agriculture (PA) and Geographic Information Systems (GIS) Certificate programs were viewed as an “island” external to the community college departments. One of the tasks in sustaining programs was to bring the program into the mainstream of the college and assist the instructors, administrators and support staff to do the same. The sustainability and integration of the PA and GIS courses into the mainstream of the community college has been completed. For GIS, one full-time instructor was hired by the college. The program has an Adjunct Instructor available to use as a backup or to help with additional classes. Precision Agriculture has one full-time Instructor with the college. The college is in the process of hiring an additional Instructor; there have been several Instructors who were brought on the staff, but didn’t work out. As the college administration is discovering, quality Instructors in both PA and GIS are hard to find in this geographical location.

6.0 Evaluation Results Discussion

The overall discussion of the evaluation summary results is now undertaken within the context of referencing the key outcome evaluation questions, the TAACCCT research questions, and the MNCGT analysis research questions.

6.1 Discussion by Key Outcome Evaluation Questions

- 1. To what extent does the project increase attainment of certificates, diplomas, and other industry-recognized credentials to better prepare TAA-eligible workers and other adults for high-wage, high-skill employment or re-employment in growth industry sectors?**

The Precision Agriculture (PA) and Geographic Information Systems (GIS) coursework prepared TAA-eligible workers and other eligible participants for employment or re-employment in potential high-wage and high-skill employment in a number of ways. They effectively addressed a need for introductory-level training in Precision Agriculture and Geographic Information Systems. The GIS program did a great service to non-traditional students through instructor flexibility and online curriculum. The two programs provided coursework and support services to facilitate the completion of certificates, diplomas and further degrees. The programs also provided a variety of approaches to achieving training in PA and GIS fundamentals (traditional coursework on campus, online courses, and hybrid coursework). Completers of the GIS program also seem to find high-wage, high-skill employment. The PA Program is lacking in the ability to serve non-traditional participants and for most that completed the PA Certificate, their jobs seem to be in line with general agriculture professions, not specifically Precision Agriculture at this time. This will change with the implementation of Precision Agriculture as an Associate of Applied Science (AAS) Degree in the very near future.

- 2. To what extent does the project introduce innovative and effective methods for curriculum development and delivery that address specific industry needs and leads to improved learning outcomes and retention rates for eligible participants?**

The core curricula of the Precision Agriculture (PA) and Geographic Information Systems (GIS) programs aligned precisely with Southeast Community College (SCC) and the U.S. Department of Labor (DOL) outcomes.

The courses included (see following page):

Precision Agriculture Certificate Core Courses		
Course #	Course Title	Credit Hrs.
AGR1131	Crop & Food Science	4.5
AGR1153	Soils & Plant Nutrition	6.0
AGR1171	Ag Technology	3.0
AGR1172	Ag Precision Hardware	4.5
AGR2279	Precision Technology	4.5
AGR2295	Advanced Precision Technology	4.5
Total:		27.0

GIS Technician Certificate Core Courses*		
GIST1110	Introduction to Geospatial Technology	4.5
GIST1120	Spatial Analysis and Modeling	4.5
GIST1130	Data Acquisition and Management	4.5
GIST1140	GIS Capstone	4.5
GIST1900 or 1901	Internship/Cooperative Experience	4.5
Total:		22.5

**The GIS coursework is also embedded in the AAS degree for Land Surveying/GIS/Civil Engineering Technology.*

All GIS courses are offered totally online which allows to students to complete the assignments at a convenient time for them throughout the week. The program also opens up opportunities for students throughout the U.S. to obtain a Certificate in GIS. Students do not have to purchase GIS software because they gain access to the software by logging onto a remote Southeast Community College (SCC) server with a virtual desktop. The programs are very hands-on for each program. The main goal was to make sure that participants were able to touch, feel, and see the activity or concept the instructors wanted to achieve. The GIS program introduces innovative and effective online curriculum for participants that both addresses industry needs and allows for retention of participants because it is so flexible. The PA program in theory is innovative and effective for serving traditional and non-traditional participants but needs some adjusting for success in the future to better serve both populations. Both the GIS and PA curricula were designed with these objectives in mind, to teach innovative and effective coursework that addresses specific industry needs and produces graduates who can bring a new level of expertise and knowledge to the industry. The Transitions Lab (T-Lab) provided services to improve students’ skills in reading/writing and math. No specific industry needs are addressed in the T-Lab. This intervention targeted college entrance and retention, orienting participants toward program completion.

3. To what extent does the project demonstrate, for TAA-eligible workers in particular, improved employment outcomes as a result of the funded program?

The Precision Agriculture (PA) and Geographic Information Systems (GIS) programs have the potential to improve employment outcomes in a variety of ways. The coursework related directly to the needs of agricultural and GIS organizations for their employees. Businesses seek employees with background and Certificate directly related to PA and GIS areas. In addition, the students who completed these certificates had the assistance of a Placement Specialist to help them decide on career options and seek employment. The specialist assisted students in finding internships and setting up meetings between graduates and potential employers. The GIS program provided valuable training for students who already work in the GIS field, but have never received any formal training. The GIS program also helped workers from outside the GIS field the opportunity to gain new training to obtain a job in the GIS field. There were no TAA-eligible completers; however, the projects demonstrate substantial improvement in employment

outcomes for the “other participants”- out of the 82 completers 61 were incumbent workers. Of those 61, almost half (28) received wage increase after completing the program. Of the 21 non-incumbent completers 15 obtained employment the first quarter following graduation with the Certificate (71%) 12 of those have retained this employment for the second and third quarter after completion (9 months).

6.2 Discussion by TAACCCT Research Questions

1. **What service delivery and/or system reform innovations resulted in improved impacts for participants?**

From an instructional standpoint, Southeast Community College (SCC) piloted a variety of approaches. From a system reform perspective, several innovative features emerged. By offering on-line and face-to-face classes, the grant project was able to meet a variety of student needs, including non-traditional students, students whose employer’s required skill enhancement, and students from remote areas and/or out-of-state students who would not otherwise have had the opportunity to receive the education offered by this grant project. Transitions Lab intervention was designed to improve services for students who are challenged by the college’s entry process, including placement/testing, admissions, financial aid, and registration. Providing advising services that “wrap-around” students individual needs primarily at the point of receiving low placement test results was the innovation.

2. **Under what conditions can these innovations most effectively be replicated?**

There are a variety of “conditions” that would greatly facilitate the replication of the curriculum, instruction, assessment and systemic innovations. The first is obvious: There must be an actual need in the potential service area. Don’t go for a grant just for the money. The college must ascertain the value that businesses and industries link to various certificates (ex. community college certificates, diplomas, etc., and other credentials). Second: those who will be actively involved with the program must be part of its development from the very beginning, including the potential instructors. Third: there must be a clear understanding of the “culture” of the community college (i.e. “How we do business”) and how these programs would fit into that culture for it to be successful. Fourth: there must be constant communication at all levels in the college, from support staff to instructors to the president. In addition, there must be clear articulation agreements among potential partners, including universities and other community colleges (if necessary), the State Department of Labor, and other entities requiring written articulation agreements. Fifth: sustainability and scaling concepts will be introduced from the very inception of the project, and reinforced on a quarterly basis with information and dialogue. Sixth: a “developmental” evaluation process (i.e. external evaluators meet on a regular basis, conducting site visits, interviewing staff, surveying staff, reviewing curricula/courses, and providing feedback on an ongoing basis) can provide timely data to make mid-course corrections. Seventh: study ways to improve the connection between US DOL and state DOL more effective. The current system restricts the flow of individual data that would greatly enhance the analysis. Eighth: the use of a participant (“intrusive”) coaching service is essential in providing support for student achievement, from academic, career and personal/social standpoints. Lastly: each program will require a “champion,” someone who has the ultimate control over the project and can focus on maintaining/expanding the program.

For non-traditional students who still need to work while continuing their education, online programs should be encouraged when possible. Participant support services should be directly involved with the participant and their advisor/instructors whenever possible, especially in the agriculture area, which tends to have a culture of its own. Both the GIS and the PA programs should continue to offer coursework that meets the demands of changing industry and offers quality education that may not be as easily obtained elsewhere.

A personalized advising model can be replicated at the placement/testing center at any college. Joining testing to advising, as well as advising to other student services (admissions, registration, financial aid) is recommended. Isolating services and the staff within them isolates students and creates a physical and mental bureaucracy or maze for students to navigate. Providing an advising model that works with, within, and across all of the staff within these services is replicable by creating communication channels and team-building strategies that examines the college matriculation process through the eyes of potential students who often come from first-generation, low-income backgrounds.

3. What are the types of emerging ideas for service delivery change and/or system reform that seem the most promising for further research? Under what conditions are these ideas most effective?

There are a variety of emerging ideas for innovation at both the program level and the system level. First is the ability and willingness of the community college departments to work together to develop and share curricula and instructional methodologies. There is strength through numbers. Second is the expanded use of “success coaching” (proactive coaching) to meet the needs of students at their level of need, whether it is academic, career or personal/social. Too many times students leave college, not because they cannot do the coursework, but because they have lost their means of transportation, or their source of income or a family crisis. Colleges are recognizing the need for quality advising, but more advisors often have specializations tied to grant money and unique programs. Delivering quality advising necessitates a common advising model an institution needs to research, adopt, and continually modify across all programs. Third there is the idea of bringing the coursework to the local communities and local businesses, through online course delivery with “hands-on” lab time to provide a real-life situation. They might also consider further modularizing courses to meet the needs of potential participants who might be full-time employees. For education in general, the competency-based education (CBE) approach allowing participants to advance based on their ability to master a skill at their own pace regardless of environment seems to be a growing area and would be a good way to introduce any new programs. This method meets different learning abilities and can lead to more efficient participant outcomes. Online programs are most effective when students are motivated and are comfortable using computers, software programs, and Moodle, in addition to continue offer courses both on-line and face-to-face to meet the needs of all students who desire to better their lives and enhance their careers.

From an outreach or recruitment standpoint, one could consider the expanded use of various forms of outreach/recruiting: social media, hard copy, web-based formats, Public Service Announcements (PSAs), presentations to social service and human resources organizations, high school connections, or the use of a blog to promote dialogue on issues related to the project. In addition, the college could expand the creation of dual enrollment processes with high schools and high school career academies.

4. What directions for future research on the country’s public workforce system, and workforce development in general, were learned?

In reviewing the progress of the PA and GIS coursework and certificates, several areas would be worthy of future research. The first area is the connection between the U.S. Department of Labor (DOL) and the State Departments of Labor. The U.S. DOL rightly requested rigorous analysis of the impact of the program on employment data; however, the state DOLs could only return aggregated data to the community colleges, thus not allowing for the “cause-and-effect” analysis between an individual’s college work and his/her employment, wage and retention. The second area is expanding grant opportunities, including partnering with middle schools, high schools, communities, and four-year colleges and universities; and lengthening the duration of grants. There is a greater need to collaborate with other institutions with similar programs as well as agricultural and technical leaders to ensure comprehensive coursework

offerings, in addition to the need for effective upfront communication on a regular basis to inform and obtain stakeholder buy-in. This includes getting any new program Workforce Innovation and Opportunity Act (WIOA) eligible and referable by workforce development officers. Attempting to hire the appropriate staff, develop robust curriculum, acquire the supportive resources and design the evaluation process takes time, cutting into the first and possibly the second year of the grant. The second year can easily be one of revision; by the third year most programs are operating at maximum capacity. The fourth year is one for evaluation only. A more feasible approach may be to keep the amount intact but lengthen the scope of the grant to five or possibly seven years, giving the program time to “mature” and evaluators to gather more longitudinal data for analysis.

Entering college is often the hardest step, not final exams or graduation requirements. Providing support services that bridge gaps in a vast diversity of experiences consequently demands diversely skilled advising and college staff. Advisors not only need to study all corners of an institution but all corners of other institutions and human experience involving high school experiences, refugee and immigration experiences, cultural backgrounds, and disability/accessibility issues. The make or break point is often at entry into college where first impressions are made and relationships either begin or end abruptly.

6.3 Discussion by Implementation Analysis Questions

The project external evaluation team conducted an implementation analysis process at regular intervals in the project and was represented at all of the project leadership meetings to debrief ongoing observations and to engage the project staff, and frequently, community college administrators on perceptions of how the project was going across the PA and GIS programs. The following cumulative results were guided by the implementation analysis questions.

1. How was the curriculum selected, used, and/or created to undertake the overall project intervention (and related instructional activities) and how does it appear to be developing?

As of the date of this final report, the core curriculum of both the Precision Agriculture (PA) and the Geographic Information Systems (GIS) programs have aligned precisely. Professionals from across the state of Nebraska also periodically reviewed the program during the annual Advisory Committee meetings. The work of three previously funded TAACCCT projects was leveraged to assist in the setup/model of curriculum. GIS collaborated with Round 1 TAACCCT grantee Del Mar College in TX Consortium who completed ten courses in geographic technology. Final model came from GeoTech (National Geographic Technology Center of Excellence <http://www.geotechcenter.org/>). Precision Agriculture met with Round 2 TAACCCT grantee Lake Region State College (LRSC) in North Dakota for assistance in developing the curriculum. A DACUM © (“Developing A Curriculum”) was held for both PA and GIS to assist in course development. Transitions Lab was built on the successful work of Round 1 Nebraska Consortium grantee, Transforming Industry and Training (TRANS*IT), in which SCC participated. The Project Manager and staff expanded the T-Lab featuring wrap around advising and a self-paced, adaptive software solution, enabling participants to target and improve basic reading, writing and math skills according to individual needs and created a Transitions Lab on all three campuses.

Curriculum continues to develop/progress: GIS courses are constantly changing to involve new tools/techniques and desired skills required for the industry. The latest update is the use of ArcGIS Pro software. Precision Agriculture courses are also evolving to cover the latest technology updates. Both PA and GIS programs are looking to develop AAS degrees. In preparing the curricula for both programs, a 2012 Precision Ag DACUM workshop was conducted and in December, 2013, a DACUM workshop for GIS/GPS Technology was completed. Nearly every program has a DACUM workshop every 5 years. Precision Ag will have another DACUM workshop in November 2017.

T-Lab is currently focusing on collaboration with the student success center to create a more comprehensive guide to study habits and retention strategies. They are also checking into online tutoring capabilities to help reach those students who aren't physically able to come to campus for tutoring assistance for many different reasons. Curriculum was selected, used, and created in Transitions Lab after an analysis of placement test questions and freshmen level math, reading, and writing courses. Faculty from English and Math were also consulted in the creation and selection of curriculum. Some GED course materials were also drawn from. This process has been on-going as placement tests change. The software, Pearson's MyFoundationsLab, was a cornerstone resource after examining many products that could be used off-campus by students. This product was chosen based on content, student needs, adaptability, price, and service.

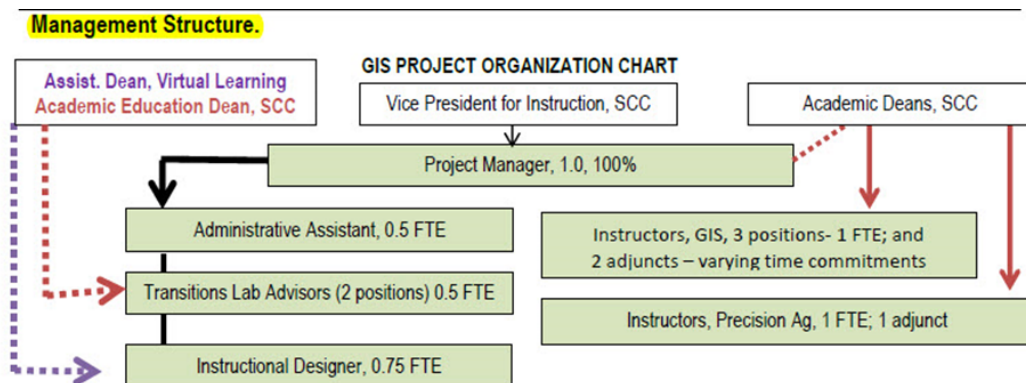
2. How were related courses, programs and program designs improved or expanded using grant funds? What delivery methods were offered? What was the program administrative structure? What support services and other services were offered?

As of September 2017, the administrative structure for the grant continues to be well established and refined, with a Project Manager providing leadership and overseeing the development of the activities, services and resources. The Project Manager, staff, and the Recruiter/Success Coach met on a regular basis, to share successes and discuss curricular and instructional issues, to receive updates from the Department of Labor and other helpful sources, to discuss quantitative and qualitative data with the external evaluators and each other, and generally to keep each other informed and connected.

In addition, the program was supported by a number of other services and resources. SCC had a full-time Recruiter/Success Coach. The coaching model was successful in working with students in a variety of ways, from providing information on the certificate program to advising on a job/career direction to assistance with personal/social issues to being that "sounding board" that so many students, both traditional and non-traditional, need to successfully navigate the coursework and successfully complete the program.

The grant-funded GIS program helped to expand the Land Surveying program by offering elective and general education options as well as new equipment (drones). The delivery method for GIS was online. The delivery method for PA was more traditional, both in-person and hybrid (traditional/online).

The organizational chart following depicts the administrative structure.



The grant has allowed Southeast Community College (SCC) to stay up to date in areas that wouldn't have been possible otherwise. It allowed them to utilize the following: VRI, Drones, Mobile Trailer, Gator, and a variety of innovative equipment and techniques. Both programs (GIS and PA) offered online classes to

students and also continuing education classes. A new course, GIST 1000/GEOG 1000, Exploring Our World: Fundamentals of Geoscience, was developed as a general educational course offered online. All of the GIST courses were developed as totally online courses using the Moodle learning platform. An Instructional Designer was hired to help construct the courses in the online learning platform. Along with the Instructional Designer, SCC provided the support of their Moodle Instructional Designers. Support services that were offered through the grant were the Transitions Lab, Recruiting/Success Coaching and Placement Services. Also, all resources of the college were available to participants such as tutoring, disability and veteran's services, career advising, academic advising, the testing center etc. Both GIS and PA curricula are being taught and evaluated, and both appear to be successful (from student and instructor feedback).

Transitions advising was created along with the Continuing Education course it offers - QuickStart. No courses, programs, and program designs were improved or expanded. The delivery method used for QuickStart was a learning management system, Moodle, for online course delivery, as well as online study materials (MyFoundationsLab). Support services include on-campus advising and tutoring.

3. What particularly important contributions did some of the partners (employers, workforce system, other training providers and educators, philanthropic organizations, and others as applicable) make in terms of program design, curriculum development, recruitment, training, placement, program management, leveraging of resources, and commitment to program sustainability? What factors contributed to partner involvement or lack of involvement in the program? What contributions from partners were absolutely critical to the success of the grant program? Which contributions from partners had less of an impact?

As the External Evaluators watched the project develop to this later stage, several partners played a crucial role in the development and implementation of the Precision Agriculture (PA) and Geographic Information Systems (GIS) curricula and coursework. The grant proposal was developed through the DACUM (Developing a Curriculum), utilizing the knowledge of experts in both areas. The GIS Instructor designed the GIS curriculum while teaching each course, recruiting students, and managing the duties of Program Chair. Early in the grant period information was shared from other community colleges and other educational institutions. The program Deans for both GIS and PA were instrumental in overseeing the curriculum development and implementation of the programs within their respective area.

The expertise of the GIS Advisory Committee members was invaluable in answering questions and providing guidance as to what needed to prepare students for jobs upon completion of the GIS Certificate. The GIS Advisory Committee members were critical in ensuring the success of the GIS Certificate program. During the Advisory Committee meetings, employers were free to make suggestions to improve the curriculum; for example, employers at the PA Advisory Committee meeting brought up the issue of hands-on experience and soft skill abilities. Their opinions were noted and heard by the VP of Instruction. Employer contributions with the greatest impact were placement for GIS internships with the support of the Placement Specialist. The partners such as the City of Lincoln, Lancaster County and the State of Nebraska provided valuable feedback on the material being covered in the GIS courses. They participated in the GIS Advisory Committee and provided internships for GIS students. The NE Local Technical Assistance Program (LTAP) enrolled several participants into the GIS program. The Project Manager and staff made numerous contacts with local businesses and organizations, seeking to build a connection where the PA and/or GIS certificate programs could function as a basic training program. The college also reached out to community agencies and organizations, with presentations and printed material among other activities. They worked with the Nebraska Workforce Development offices.

Though the grant had the support of contacts with Workforce System, the Nebraska Department of Labor (NDOL), Proteus (National Farm Workers Assistance Program) and others, they did not receive any participant referrals or any tangible benefits from them. In addition, the Project Manager and the External

Evaluators worked closely with the Nebraska Department of Labor in developing a process for collection employment, wage and retention data. The roadblock that kept the community college from collecting individual data was the policy that data can only be released in aggregate. This kept the External Evaluators from analyzing the impact of various levels of completion of courses with the employment status, wage increase and retention in a job.

4. Was an in-depth assessment of participants' abilities, skills and interests conducted to select participants into the grant program and to facilitate a project comparison process? What assessment tools and processes were used? Who conducted the assessment? How were the assessment results used? Were the assessment results useful in determining the appropriate program and course sequence or refinements for participants? Was career guidance provided, and if so, through what methods?

The community colleges in Nebraska are required to admit anyone into certificate programs. Therefore, the assessments (the eCompass and ACT) are not for "screening" students. This information gives college staff and the students focused information on where the deficiencies are and how to remediate them. The assessments also give success coaches information to work with students regarding remediation and career/job opportunities. In addition, they utilize the activities and workshops developed to support students' success. The coaches act as "navigators" for many of the students, assisting them with obtaining financial aid, selecting follow-up courses if they wish to pursue education beyond the certificate, directing them to other sources of information and support either within the college or in the community, and working with them on procuring employment either during their college enrollment or after they leave the college system.

There was no in-depth assessment used for participant selection or to facilitate a comparison group. Anyone who wanted to enroll in the coursework and who was accepted into the college was permitted to do so. The college uses SAT and ACT scores to determine admission; however there are no prerequisites for the programs. Career Guidance was available through SCC's Career Advisement and Placement Specialist. A computer assessment for the online GIS course is something that was discussed adding due to issues arising from folks not realizing all the skills needed to participate in an online environment. Options were located and sent to the instructor for future use.

The Transitions Lab was very useful in assisting students who needed support with reading/writing and math. In-depth assessment of participants included a placement test, usually COMPASS placement test of students' math, reading, and writing skills. SCC's Testing Center technicians administer the assessment tool and would direct participants to Transitions Advisors if students' scores were within the range of our target population. At that time, advisors would interview students to determine the appropriate selection/non-selection of participation in Transitions. An in-take interview that assessed student interest, ability to benefit, and anticipate potential barriers and needed support was part of the advisors' interview with potential participants.

5. Contextually, how are the program implementation components generally aligned with the nine required TAACCCT program indicators?

As of this final report, the program components are closely aligned with the nine (9) indicators and these indicators were established within the context of a forty-five (45) variable quantitative data spreadsheet and SPSS analysis. The TAACCCT program indicators were utilized to develop the participant spreadsheet that tracks these data, along with other important data, to monitor and evaluate the success of the grant. The Project Manager worked with her college data services to gather, clean, and refine procedures for accurate data on student enrollment. The Project Manager and the college staff has maintained contact with the Nebraska Department of Labor to accurately gather employment, wage and

retention. Several course development efforts have taken a more traditional approach, with courses in-house; others have taken a more “hybrid” approach, with a combination of online, classroom and lab work; other courses were fully online. However, no matter the method of program implementation, each has closely adhered to the nine program indicators and gathered data to meet those outcomes.

Nineteen (19) participants completed the coursework but did not receive a credential due to misunderstandings about procedure; the graduate application was due a quarter before AAS Degree application along with an extra \$25 graduation fee. Transfer courses, the ability to use a course substitution form for Ag Math, and above courses (1400 and above) (1040 and above) (1050 and above) were also not taken into consideration at the beginning of the grant but was corrected starting FY 3 Quarter 3. Intake forms were complicated and were not gathered correctly at the beginning. An online, streamlined process was also instituted FY 3 Quarter 3. Unfortunately, there was only 1 TAA-eligible participant in the program and he did not complete. A sizeable number of participants completed (81 out of 100 goal) given the late start to the program. Many participants completed credit hours but didn’t finish the certificate. A significant number of participants continued their education at four year institutions (30).

Many participants did obtain and retain employment. Most are working if they aren’t continuing their education. Of the 333 participants there were 268 incumbents to start with. They were either working part-time, full-time or listed self-employed. 98 of those were farm, farm hand, or family farm related. Of the 82 completers, 61 were incumbent workers. A sizeable number, twenty-eight (28) of the eighty-one (81) completers, indicated they received a wage increase.

6. How will the evaluation team discover, and the team respond to, unanticipated outcomes of the TAACCCT program, both positive and negative?

Throughout the project, the evaluation team worked closely with the Project Manager and the Recruiter/Success Coach. In addition, the Project Manager had 24/7 ability to connect with the evaluation team. The evaluation team also conducted quarterly site visits to gather qualitative information for a case study for the community college (see Appendix 2). They gathered quarterly quantitative data on all forty-eight items. The evaluation team monitored and evaluated the data tracked on the participant spreadsheet throughout the grant period; therefore there should be no surprises at grant closure. The grant program staff has been following up with participants to ensure data is complete and accurate. The evaluation team conducted formative curriculum review conversations and provided comprehensive feedback documents to the project team. To triangulate the incoming information from all of the above, the evaluation team conducted an online survey of the PA and GIS staff and noted trends in the twenty survey items.

By utilizing a Developmental Evaluation approach, the evaluation team gathered and analyzed the quantitative and qualitative data from the college; they then had the information necessary to provide valid feedback to the Project Manager and staff on an ongoing basis. They stayed abreast of the curriculum, instruction, recruiting/outreach and support services as they emerged, lessening the potential for “unanticipated” outcomes. The team responded to positive and negative outcomes by communicating through all the proper channels. The final report and observations will be shared with the college for consideration on implementing any influential changes to make the programs better. These same outcomes will be articulated to all stakeholders.

Flexibility has been a hallmark of transitions and it is expected to continue in order to meet student counts, and student and institutional needs. Staffing, curriculum design, and intra-institutional communication with other support staff are regularly under review.

7. How efficacious are the program interventions being undertaken (defined as “the power to produce a desired result or effect”)?

At this final report, where the external evaluation team has reviewed the four years of the program, a number of the interventions have proven efficacious; others have proven less so. The Precision Agricultural (PA) and the Geographic Information Systems (GIS) curricula both have a solid core. The syllabi, objectives and activities were well structured and readily adaptable for use by Southeast Community College (SCC) based on their individual culture. Both the PA and GIS programs were well researched with the initial DACUMs (Developing a Curriculum). They went through constant self-evaluation and updating of instructional methodologies, innovative instructional “tools” and functional resources both in the college and in agricultural and business worlds. One example was the involvement of the Transitions Lab (T-Lab) that was a vital resource for remediation in reading/writing and math. The T-Lab, along with the college’s advisory staff, became part of the “wrap-around” services for students. When students would register for courses, all of the instructors, the T-Lab coaches and the advisors would be in the same locale to provide guidance, answer any questions and direct/support students in making the best choices. From the Transitions Lab perspective, indicators such as improved placement scores, passing out of developmental coursework, retention, and program completion suggest the program interventions involving Transitions has been efficacious.

Hybrid (or blended) education evolved as a natural by-product of the rise in online education. Recognizing that face-to-face and online education both offer unique learning advantages, hybrid instruction bridges the gap by incorporating both approaches to utilize the instructional mode that is best suited to the learning objectives or activities of a particular topic. For faculty, transitioning from a face-to-face course requires not only a shift in pedagogy, but also a change in the philosophical paradigm underlying teaching and learning.

From the standpoint of “other participants” instead of “TAA eligible participants”, the project is reasonably efficacious. The GIS program on its own is substantially efficacious and *could* and did serve TAA eligible and other participants very well if/when enrolled. The PA program did not serve non-traditional participants well. They either dropped out or never registered at all because the faculty were unwilling to reform the lab/activity portion of the curriculum to suit nontraditional/off-campus needs. They reformed the courses on paper but not in practice; these needs were not accommodated according to how they were described during outreach utilizing the brochures.

Additional effort should have been spent to help the Agriculture faculty understand the overview and decision-making process for redesigning the PA courses into a hybrid format and examine best practices in hybrid instruction to suit both traditional and non-traditional participants. Particular emphasis should have been placed on helping faculty rethink and redesign the learning experience to maximize the benefits available via a hybrid format. These kinds of changes are difficult in and of themselves, even more so, when implementing them without 100% faculty buy-in and with such a long-standing traditionally hands-on program. These were very special circumstances due to the 900 acre farm the community college utilizes on its campus.

Most who plan to implement this type of program would not encounter this special issue as described in the last paragraphs. More change management tools and techniques should have been utilized to manage this unknown-unknown risk. Despite that risk management acts as “forward-looking radar,” it is not possible to identify all risks in advance, in part for the following reasons (Hillson, 2005):

- Some risks are inherently unknowable.
- Some risks are time-dependent.
- Some risks are progress-dependent.
- Some risks are response-dependent, i.e., secondary risks

7.0 Study Limitations and Final Comments

7.1 Evaluation Study Limitations

“Limitations are matters and occurrences that arise in a study that are out of the researcher’s control. They limit the extensity to which a study can go, and sometimes affect the end result and conclusions that can be drawn. Every study, no matter how well it is conducted and constructed, has limitations. This is one of the reasons why we do not use the words “prove” and “disprove” with respect to research findings.” (Simon, M. and Jim Goes, *Scope, Limitations, and Delimitations*, 2013). There are a number of limitations with regard to the evaluation study. Due to policy issues with the Nebraska Department of Labor, the Project Manager was only able to gather aggregated data on employment, wages and retention. This limitation minimized the ability to analyze data comparing the level of student involvement in the activities, resources and services with those data points. A second limitation could be the impact of the culture of SCC, culture defined as “the way we do business.” The culture impacts the following: the hiring process, the financial process, the recruiting process and ultimately the sustainability and scaling process after the grant funding ends. A third limitation is the students’ life outside the scope of the training program; a variety of stressors, both positive and negative, can impact the continuation and ultimate completion. Examples include getting a well-paying job and ending the program of study; having serious family issues; losing one’s means of transportation; obtaining financial support from family or employer to continue the program.

7.2 Evaluation Final Comments

The developmental evaluation approach utilized by the external evaluators proved to be very successful for an evolving program such as MNCGT’s programmatic efforts. The Project Manager, staff, coaches and administration provided open access to the developmental process of the curriculum, services and resources; the evaluators were able to meet on a quarterly basis to talk with all staff members and solicit their feedback in an open and honest manner. The activity that stood out as having the greatest potential of service to students was the supportive and engaging program, staff and coaching environment. Students entering the program had a variety of needs that were not being addressed by conventional services; having the “guide-on-the-side” was so important to helping successfully navigate the Certificate program. One of the shortcomings of the program was the limited duration of the grant itself, with such a short time to hire staff, develop and implement the curriculum and gather any longitudinal data to fully analyze the impact of the program. The Project Manager and external evaluators were also restricted in the analysis due to policies of the Nebraska Department of Labor, only allowing for aggregated data on employment, wage increases and retention.

8.0 Appendices

Numerous documents were generated by the project evaluation process. Samples of some of these documents follow as appendices. Examples included here are not the full documents, but rather excerpts of those documents, due to report space constraints. The full documents are available upon request.

Appendix 1: Curriculum Review Process Definitions (Iowa State University)

Appendix 2: Curriculum Review Checklist

Appendix 3: Curriculum-Related Review Process References

Appendix 4: Staff and Stakeholder Survey Summary

Appendix 5: Student Survey Results

Appendix 6: Potential Future Courses

Appendix 7: Example Advising/Outreach Brochures

Appendix 1: Curriculum Review Process Definitions (Iowa State University)

The following is the curriculum definitions, which were developed by Iowa State University, and used to support the MNCGT curriculum review process.

Curriculum Review Process Definitions – ISU Extension and Outreach

Program:

A coordinated set of learning experiences designed to achieve predetermined outcomes. Programs follow a continuum – starting with an initial environmental scanning, followed by application of the learning experiences, and resulting in changes in knowledge, behavior, and condition (as stated in the ISUEO program development process).

Program Review:

The assessment of the program environmental scanning process, program development, and reporting impacts. A review includes an assessment of how the program will be evaluated to determine what it has achieved.

Curriculum:

A group of planned educational offerings including materials, exercises, and activities intended to create a change in knowledge, behavior, or action

Curriculum Review:

Evaluation of educational offerings, delivery, and evaluation of those activities designed for a specific audience to maintain consistent standards of quality and credibility

Peer Review:

A process conducted by colleagues knowledgeable in the content and educational practices to assess subject matter and curriculum or program quality

Evidence-Based:

Programs that have been found to be effective based on the results of rigorous evaluations (What Works, Wisconsin, Small et al.)

Evidence-Informed:

Research-based principles of program effectiveness are incorporated into current programs (Small, Cooney and Connor)

Best Practices:

Activities and behaviors that work most effectively, informed by research and experience

Research-Based:

Careful study of a given subject, field, or problem undertaken to discover facts or principles

Information:

The communication of facts, data, or evidence

Information Checking:

Reviewing documents for errors, accuracy, and format of data being presented

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Appendix 2: Curriculum Review Checklist

The following curriculum review checklist, as developed by Iowa State University, was the basis of the focus group conversation on the MNCGT curriculum.

Curriculum Review Checklist – ISU Extension and Outreach

Procedural

- Meets the curriculum definition. (See Curriculum Review Definitions.)
- Curriculum goals match program goals and ISU Extension and Outreach’s mission.

Content

- Information and materials are research-based.
- Curriculum is sponsored by, or approved by, a land-grant university or other reputable institution. Examples include: Federal and State agencies (USDA, DOE, HHS, Commerce, etc.) and non-Land Grant public universities.
- Intended curriculum outcomes focus on positive behavior changes leading to economic, environmental, civic, and/or social conditions.
- Non-original content is clearly and appropriately cited.

Readability

- Training materials and facilitator/instructor notes included.
- Teaching materials match intended facilitator/instructor knowledge and teaching skills while addressing specified learning objectives.
- Learning objectives are clearly stated and are developmentally appropriate.

Utility

- Curriculum has been piloted or previously used with clientele in a relevant context.
- Curriculum is learner centered.
- Learner materials are culturally appropriate.
- Educational, hands-on activities accommodate different learning styles.
- Intended curriculum audience has been involved in developing or shaping the curriculum.

Evaluation

- Program evaluation methodology and outcome evaluation tools and processes are included.
- Curriculum outcomes are realistic for the audience and context.
- Information and activities are easily replicable.
- Information and activities are easily adapted for changes in types of learners, learning environments, scope of educational learning experience, etc.

Appendix 3: Curriculum-Related Review Process References

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Appendix 4: Staff and Stakeholder Survey Summary

The PA and GIS staff and contributing partners were surveyed in the Fall of 2016; the survey revealed a number of positive trends and several that remained ongoing concerns. The survey was administered via Survey Monkey with assurances of anonymity and confidentiality. The only person with access to the raw data was the external evaluator. He released the aggregated results to the Project Manager to share with the staff and partners. The sample sizes were comparatively small; the open-ended responses are representative, based on ongoing feedback during the Advisory Committee meetings and quarterly staff interviews.

Summary of Responses to Likert-Scale Survey Questions

Survey questions were rated on a scale of “strongly disagree” to “agree.” The following table summarizes the percentage of respondents who indicated that they “strongly agree” or “agree” with each of the questions listed.

Southeast Community College Precision Agriculture Survey Fall 2016 (6 respondents)

Table 8.1-A. Percentage of Respondents that “Strongly Agree” or “Agree” by Survey Question

Question #	2016
5. Right Track Curriculum Development	71.4%
6. Right Track – Alignment of Courses	71.3%
7. Right Track – Curricular Resources	71.4%
8. Right Track – Articulation Among CC Campuses	14.3%
9. Right Track – Articulation CC – UNL	14.3%
10. Right Track – Articulation CC – PA Leaders	42.9%
11. Right Track – Training of PA Staff	57.4%
12. Right Track – Outreach/Recruiting	58.2%
13. Right Track – Communication – Staff	42.9%
14. Right Track – Data Collection	57.1%
15. Right Track – Assessment of Outcomes	83.3%
16. Right Track – Completion of Outcomes	71.4%
17. Understand Purpose of PA Project	85.7%
18. Making Appropriate Progress	71.4%
19. Methods of Instruction Appropriate	57.1%
20. Deliverables Appropriate	71.4%
21. Recommend Program	71.4%
22. PA Will Be Sustained After Grant	85.7%

Recommendations:

- Too ensure that students get to fully use the training in the field labs we have.
- Continue to stay current
- I think it would be helpful to have more faculty buy in.

- Work with University extension, ask them what farmers are most interested in when it comes to PA, they are often involved in trying to answer farmer questions

Barriers:

- Qualified Staff

Suggestions:

- Reach out to the Academy of Model Aeronautics. I would also suggest hosting an International Drone Day event at one of your campuses. Reach out to any local model aircraft groups in the area. They generally are looking for a place to do things and some of them could be potential students or instructors!
- You need to go to the students and have students demonstrate what they have learned and what students who come to SCC will learn.
- Continue seeking strong and active partnerships
- It is difficult to assess how to make these connections moving forward. This seems like something that could have been done really early on in the grant because it takes time for real relationship building. It is difficult to build them in a few months. I think involving as many of these groups in advisory committee meetings could be a start!
- Businesses are generally trying to promote their products in everything they do. I would not get too cozy with any provider of a given technology (software, UAV, and irrigation companies for example)

Open Response Question Results (Selected Responses)

The surveys also included open response questions that were provided consistently on each of the survey responses. The following open-ended responses are representative of the many ideas provided from survey respondents.

- I can appreciate the forward thinking and effort to be on the cutting edge of tomorrow's agriculture.

Southeast Community College GIS Survey Fall 2016 (15 respondents)

Table 8.1-A. Percentage of Respondents that “Strongly Agree” or “Agree” by Survey Question

Question #	2016
5. Right Track Curriculum Development	76.7%
6. Right Track – Alignment of Courses	60.0%
7. Right Track – Curricular Resources	60.0%
8. Right Track – Articulation Among CC Campuses	21.4%
9. Right Track – Articulation CC – UNL	35.7%
10. Right Track – Articulation CC – GIS Leaders	69.0%
11. Right Track – Training of GIS Staff	53.3%
12. Right Track – Outreach/Recruiting	64.3%
13. Right Track – Communication – Staff	64.2%
14. Right Track – Data Collection	42.9%
15. Right Track – Assessment of Outcomes	66.7%
16. Right Track – Completion of Outcomes	60.0%
17. Understand Purpose of GIS Project	73.4%
18. Making Appropriate Progress	66.7%
19. Methods of Instruction Appropriate	60.0%
20. Deliverables Appropriate	92.9%
21. Recommend Program	80.0%
22. GIS Will Be Sustained After Grant	83.3%

Recommendations:

- More marketing materials/info about the program sent to advisors and admissions staff
- The GIS industry as a whole faces a challenge on what to teach. Many times potential employers are seeking an individual with technical expertise on an extremely narrow list of GIS software (mainly ArcGIS). It is important that students have a broader education on GIS as a whole, and how it can be used to enhance other industries such as agriculture, engineering, construction, local government... I believe that other courses of study could tap into the GIS certificate program in a more meaningful way to provide context to what students are learning in the GIS program.
- Hiring additional instructors to meet the growing demand of the program.
- I would like to see it become a 2 year credited program. There definitely are enough GIS related classes to make this an Associate Degree.
- Ditch the whole thing and start over.
- Work in cooperation with the computer division to add GIS as a component for computer students. Since it has to do with geospatial mapping, it could interest students who want to create mapping for online use.
- Get the information at this website updated- <http://www.geotechcenter.org/>

Barriers:

- We have had two interns from the program work with us and it has been very successful. Our only problem is our hiring timeframes. This is more a problem with our agency rather than the GIS program.
- N/A--I am not in an organization that would participate in the SCC-GIS program. I work for the program.
- We are a county government with no money for a internship unless it would be free and I would have to have approval. We also are on the other end of the state.
- GIS is still unknown to many school administrators in the state - as well as the public as a whole. You might consider sponsoring a booth at the state adm. days conference. It is usually at the beginning of the year in Kearney

Partnerships:

- Identify student projects that provide actual value to the partners to directly show the value of GIS. For example, provide a small town with updated utility map, work with agricultural associations to map meaningful phenomena that may affect yield. Many of the partners are struggling to understand what GIS is and what it can do. If they see and feel that value, they will be more engaged, and the GIS program will better understand the role it can and should play. I feel very strongly that a project delivered to a critical audience will create a better opportunity to for the students to learn.
- The program has done a very good job seeking out partners. If they continue in this direction I believe they will continue to find more partners interested in working with them.
- Dedicated staff to assist with developing these partnerships; the instructor(s) don't have adequate time to do this work, nor should it be their responsibility alone.
- By what I have heard in the board meeting I believe that this program is reaching out and working with the local university students.
- Work with Academic Transfer advisors to find out where these courses could transfer if students want to continue their education.
- Have a meeting every 6 months with us at NDE to exchange ideas.

Appendix 5: Student Survey Results

Students in the Precision Agricultural (PA) and Geographic Information Systems (GIS) programs were surveyed in the Spring of 2017 regarding their prospective programs. The following summarizes the findings:

Precision Agriculture

1. How did you learn about the program?

- School personnel (SCC staff, school counselor, teacher) – 66%
- Friends – 12%
- Career Fairs and other informational sources – 15%

2. How helpful were the following (“very helpful” and “helpful”)?

- Success Coach – 73.9%
- Lab – 95.7%
- Coop/Internships – 69.6%
- Learning Supports – 65.2%
- Working with Cohort group – 91.3%
- Individual Interaction with Instructors – 91.3%
- SCC Support Staff – 73.9%

3. What has been most helpful?

- Labs
- Coop/Internship
- Instructors
- Working with Cohort members
- Hands-on Activities

4. Did the program influence your decision to continue one’s education?

- Very Influential/Influential – 26%
- Not Influential – 13%
- Do not plan to continue education – 39%
- Plan to continue in other field of study – 22%

5. What would you change to make the program better - recommendations?

- More “hands-on” activities
- More technology/software programs/etc.
- More advanced classes
- Individualize learning (students learn at different speed and in different ways)

GIS Program

1. How did you learn about the program?
 - School personnel (CC staff, school counselor, teacher) – 21%
 - Friends/Family – 21%
 - Web/Internet – 26%
 - Employers – 16%

2. How helpful were the following (“very helpful” and “helpful”)?
 - Success Coach – 21.1%
 - Virtual Lectures – 79.0%
 - Coop/Internships – 42.1%
 - Learning Supports – 11.1%
 - Individual Interaction with Instructors – 89.5%
 - CC Support Staff – 73.7%

3. What has been most helpful?
 - Instructors
 - Internship
 - Virtual Lectures

4. Did the program influence your decision to continue one’s education?
 - Very Influential/Influential – 42.1%
 - Not Influential – 36.8%
 - Do not plan to continue education – 10.5%
 - Plan to continue in other field of study – 10.5%

5. What would you change to make the program better - recommendations?
 - More “face-to-face” time
 - More technology/software programs/etc.
 - More advanced classes (possibly AAS degree option)
 - More “real-life” scenarios

Appendix 6: Potential Future Courses

GIST Introduction to GPS and Maps

An introductory course in the fundamental concepts and use of GPS technology and map interpretation. Students will gain knowledge and skills in reading and understanding maps and coordinate systems. Students will participate in field work to collect data using GPS enabled devices.

GIST Remote Sensing

This course is an introduction to remote sensing of the Earth. Topics include the physical principles on which remote sensing is based, history and future trends, sensors and their characteristics, image data sources, and image classification, interpretation and analysis techniques.

GIST Geographic Web Applications

The course involves the design, creation, configuration, optimization of geographic servers and applications to deliver content across the Internet. Students will be introduced to the design, optimization of geographic servers, and maintenance of basic geographic web services and applications. The course includes an introduction to browser and mobile enabled interactive applications.

GIST GIS Programming

The geographic industry needs professionals trained in automation of geo-processing functions using the programming language of Python for GIS and other geographic technologies. Course will cover the fundamentals of Python scripting to meet industry needs. Topics include: basic concepts using Python, creating and writing Python script for geo-processing, and customizing and automating Python in GIS.

GIST Open Source GIS

An introductory course that describes Open Source software for both desktop and internet GIS applications. Students will learn the concepts of Open Source software, and the leading desktop and web mapping Open Source software packages such as Quantum GIS (QGIS), GRASS GIS, Google Maps, OpenStreetMap, and CartoDB. Students will apply technology in lab exercises using real-world data.

Appendix 7: Example Advising/Outreach Brochures



GEOGRAPHIC INFORMATION SYSTEMS TECHNICIAN

Certificate

www.southeast.edu/GISTech

ONLINE (LINCOLN CAMPUS)




GIS careers are available in almost every field, including government, commercial, educational and many more organizations. GIS technicians assist scientists, engineers and related professionals designing or preparing data, using GIS hardware and software applications. Geographic Information Systems are one type of geospatial technology offering a radically different way to produce and use maps to manage communities and industries.

Program overview

The certificate program will provide students with the knowledge and skills necessary to develop and manage Geospatial Technology Information projects and to interpret and implement GIS as a decision support system.

GIS is a computerized database management system for capturing, storing, retrieving, analyzing, and displaying geographic information.

Geographic Information Systems technicians analyze GIS data to identify spatial relationships or display results of analysis using maps, graphs, or tabular data.

Types of jobs available:

- GIS Technician
- GIS Support Analyst
- GIS Specialist
- Cartographic Technician

Graduate Earnings

This is a new program, and no SCC graduate salary data are available. However, the Nebraska Department of Labor reports a median hourly wage of \$25.15.

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For more information contact:

Katrina Patton, Instructor
402-437-2262, 800-642-4075 ext. 2262
kpatton@southeast.edu

or the College Admissions Office
Lincoln 402-437-2600, 800-642-4075 ext. 2600



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Equal Opportunity/NonDiscrimination Policy - It is the policy of Southeast Community College to provide equal opportunity and nondiscrimination in all admission, attendance, and employment matters to all persons without regard to race, color, religion, sex, age, marital status, national origin, ethnicity, veteran status, sexual orientation, disability, or other factors prohibited by law or College policy. Inquiries concerning the application of Southeast Community College's policies on equal opportunity and nondiscrimination should be directed to the Vice President for Access/Equity/Diversity, SCC Area Office, 301 S. 68th Street Place, Lincoln, NE 68510, 402-323-3412, FAX 402-323-3420, or jsoto@southeast.edu. This publication should not be considered a contract between SCC and any prospective student. SCC's Board of Governors reserves the right to make changes in this publication during the life of the publication and without notice. A0726 - GIST (05/16)

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GIS Technician Required Courses

A grade of "C" or higher in all program classes is required to progress through the program.

Course #	Course title	Credit hrs
GIST1110	Introduction to Geospatial Technology	4.5
GIST1120	Spatial Analysis and Modeling	4.5
GIST1130	Data Acquisition and Management	4.5
GIST1140	GIS Capstone	4.5
GIST1900	Internship or	
GIST1901	Cooperative Experience	4.5
		22.5 hours

General Education Requirements:

One class from each area below

Social Science/Geography	4.5
Mathematics	4.5
MATH 1050 or higher	9.0 hours



Estimated Expenses

To determine overall costs, students should plan a budget that includes room, meals, clothing, laundry, medical care, recreation and entertainment, transportation, insurance, etc.

Nebraska Resident tuition rate is \$61.50 per credit hour. Out-of-state tuition rate is \$75.50 per credit hour. Student fee is \$1.50 per credit hour. Graduation fee is \$25.

Housing is available at Beatrice and Milford campuses only.

Quarterly tuition, books and fees are dependent upon classes taken each quarter.

31.5 credit hours to graduate with certificate.

Tuition And Fees	\$1,985
Books	567
Total Estimate For Program	\$2,552

ADDITIONAL EXPENSE:

Graduation Fee	\$25
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Southeast community college

www.southeast.edu/Agriculture

Agriculture Business & Management Technology

Beatrice Campus

Associate of Applied Science degree, Certificate

Agriculture as an industry is as complex and technological as they come. It's also one that has changed dramatically through the years. SCC has a long-standing reputation as a respected provider of concentrated technical agriculture education. A two-year degree in Agriculture Business & Management Technology gives you many career and education options. Approximately 80 percent of program graduates enter careers within the six focus areas, while 20 percent transfer to four-year colleges and universities.

Graduate Earnings

Recent graduates report an average starting salary of \$13.65 per hour.

Program Overview

This program is located on the Beatrice Campus. Students are admitted every quarter. Students may focus in Agribusiness, Agronomy, Diversified Agriculture, Golf Turfgrass Management, Horticulture, or Livestock Production.

Types of jobs available

- Golf Course Superintendent
- Grain Elevator Manager
- Livestock Genetics Salesperson
- Crop Consultant
- Landscaper
- Equipment Salesperson
- Research Technician
- Crop and Livestock Production Specialist
- Commercial Pesticide Applicator
- GPS Precision Specialist
- Agronomist
- Conservationist

Annie Erichsen - Program Co-Chair
402-228-8258, 800-233-5027, aereichsen@southeast.edu

Travis Pralle - Program Co-Chair
402-228-8254, 800-233-5027, tpralle@southeast.edu

or the College Admissions Office
Beatrice 402-228-8214, 800-233-5027 ext. 1214

This workforce product was funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. The product was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The U.S. 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.

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General Education Requirements

Contact your program advisor to select general education courses from each category which will meet your program's graduation requirements.

(One class from each area below).

Oral Communications	4.5
Written Communications	4.5
(Plus three classes from the five areas below; no two classes from the same area).	
Mathematics, Science, Social Science, Humanities, and/or Computer Technology	13.5
	22.5

Precision Agriculture Certificate

AGRI1131	Crop & Food Science	4.5
AGRI1153	Soils & Plant Nutrition	6.0
AGRI1171	Ag Technology	3.0
AGRI2279	Precision Technology	4.5
AGRI2295	Advanced Precision Technology	4.5
AGRI1172	Ag Precision Hardware	4.5
MATH1040	Business Math	4.5
		36.0

Students who wish to pursue an Associate of Science degree in agriculture should visit with an SCC-Beatrice Agriculture Business & Management Technology faculty advisor.

AGRI Core Courses:

AGRI1123	Agribusiness Careers	4.5
AGRI1131	Crop & Food Science	4.5
AGRI1171	Ag Technology	3.0
AGRI1205	Enterprise Analysis	4.5
AGRI1216	Agribusiness Management	4.5
AGRI2204	Agribusiness Seminar I	4.5
AGRI2291	Agribusiness Sales	4.5
AGRI2901	Agribusiness Cooperative Experience	12.0
		42.0

GIS Technician Certificate Required Courses

A grade of "C" or higher in all program classes is required to progress through the program.

<u>Course #</u>	<u>Course Title</u>	<u>Credit Hours</u>
GIST1110	Introduction to Geospatial Technology	4.5
GIST1120	Spatial Analysis and Modeling	4.5
GIST1130	Data Acquisition and Management	4.5
GIST1140	GIS Capstone	4.5
GIST1900	Internship or	
GIST1901	Cooperative Experience	4.5
		<u>22.5 hours</u>

General Education Requirements:

One class from each area

Social Science/Geography	4.5
Mathematics (MATH 1050 or higher)	4.5
	<u>9.0 hours</u>

Precision Agriculture Certificate Required Courses

<u>Course #</u>	<u>Course Title</u>	<u>Credit Hours</u>
AGRI1131	Crop & Food Science	4.5
AGRI1153	Soils & Plant Nutrition	6.0
AGRI1171	Ag Technology	3.0
AGRI2279	Precision Technology	4.5
AGRI2295	Advanced Precision Technology	4.5
AGRI1172	Ag Precision Hardware	4.5
		<u>27.0 hours</u>

General Education Requirements:

Mathematics (MATH 1050 or higher)	4.5
	<u>4.5 hours</u>

Or substitute the following (Must have written approval first)

AGRI1205	Enterprise Analysis	4.5
AGRI1216	Agribusiness Management	4.5
		<u>9.0 hours</u>



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