SCC GIS.PA
MAPPING NEW CAREERS IN GEOSPATIAL TECHNOLOGIES

Executive Summary of the Final Evaluation Report

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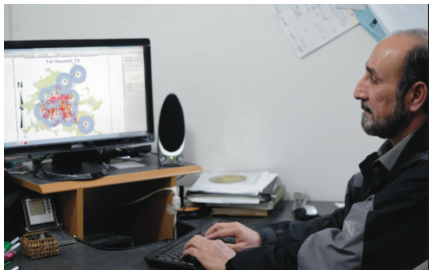

The following is the executive summary of a larger Final Evaluation Report for the Mapping New Careers in Geospatial Technologies (MNCGT) project, funded by the U.S. Department of Labor's TAACCCT (Trade Adjustment Assistance Community College and Career Training) project. The larger full report contains extended detailed sections, as well as charts and figures, and supportive appendices.

I. TAACCCT Program/Intervention Description and Activities

A. Briefly describe your TAACCCT project and purpose

MNCGT, as a TAACCCT – DOL-funded initiative of Southeast Community College in Nebraska, sought to increase the achievement of credentials through blended learning combined with experienced instructors, advanced labs, and modern technology in the context of innovative and accessible Precision Agriculture (PA) and Geographic Information Systems (GIS) coursework.

B. Describe each program/intervention that was evaluated

MNCGT was primarily comprised of two carefully designed, articulated and integrated sets of courses focusing on Precision Agriculture (PA) and Geographic Information Systems (GIS). In addition to this coursework, the programs included "success" coaching; innovative instructional approaches; a specialized "Transitions Lab" for remediation in math and reading/writing; and hands-on and web-based formats to meet participations' varied learning styles. There was also focused project collaboration with Southeast Community College (SCC) and local businesses in PA and GIS. A total of 333 active student participants were recorded in the project database by the community college. MNCGT utilized a research-based student engagement and coaching strategy for conceptual foundations to the interventions.

II. Evaluation Design Summary

A. Describe the goals of the evaluation

The purpose of this external evaluation was to assess the ongoing and final effectiveness of MNCGT's project in developing an innovative model for curriculum development, instructional innovation and support services; in training a diverse set of participants to be prepared for Precision Agriculture and/or Geographic Information Systems careers and passing community college certifications; and to help these students to qualify for and acquire high skill, high wage and high need employment opportunities in Precision Agriculture and Geographic Information Systems. The project evaluation team used a systematic Developmental Evaluation approach to undertake the process (Patton, 2014). There were three (3) sets of evaluation related research questions, with two pertaining to the nine

TAACCCT – DOL required outcomes and one dealing with implementation, with various related sub-questions for the analysis process.

B. Discuss implementation study design

The project used a case study approach for the implementation study design that carefully followed the ongoing curriculum development and its interventions, with periodic quantitative evaluation summaries of progress that aligned closely with seven TAACCCT implementation research questions below. The full report details answers to each of them.

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 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")?*

The conceptual framework of the implementation study was aligned with Developmental Evaluation principals and the context of the Precision Agriculture (PA) and Geographic Information Systems (GIS) work plans in the approved proposal, with its six priorities associated with five curriculum related deliverables (Section 2.5). These deliverables included 1) a *PA* Certificate with courses aligned with industry-recognized needs; 2) a *GIS* Certificate with courses aligned with industry-recognized needs; 3) the development of a variety of resources; 4) an enhanced success coaching model to reduce attrition and accelerate progress toward achieving each student's success; 5) the articulation of at least twenty-five percent (25%) of courses to coordinate with two articulated pathways to four-year baccalaureate programs; and 6) a coordinated effort with the University of Nebraska-Lincoln. The five curriculum deliverables were best analyzed using a blended qualitative and quantitative approach within a case study method, supported with survey feedback, as well as various quantitative count summaries and data analyses, and an external expert curriculum review process. The overall capacity building was also measured via a survey of PA and GIS staff, partners and stakeholders with feedback from an expert curriculum team. The survey indicators included perceptions of the following: curriculum, instructional and resource effectiveness, sustainability and scaling, partner involvement, recruiting and outreach activities, among others.

C. Discuss outcomes/ impact study design

The outcomes and impact research questions the evaluation study addressed follow and were aligned with the nine required Department of Labor (DOL) outcomes as represented within the context of 48 different data fields collected for each of the student participants in the project. These research questions included:

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

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

c. *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?*

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

The evaluation design was a longitudinal Quasi-Experimental Study, mixed method study which from a statistical approach, compared data on students who completed elements of the Precision Agriculture (PA) and Geographic Information Systems (GIS) programs of study with those students who had no exposure or very limited exposure. A total of 333 students were included in the dataset. A randomized design was not possible due to the community college policies. Wage and employment data was limited since only aggregate and not individual data could be retrieved from the Nebraska Department of Labor (NDOL). Thus some wage and employment outcome data was limited to a subset of students that self-reported wage and employment outcomes in follow-up student surveys. To assist in the quantitative analyses, a case study format was further utilized to ascertain innovative approaches to curriculum, instruction and support services; and potential impacts on department and overall community colleges systems, and community college and business interactions. Causal inferences from the quantitative data are very limited due to the NDOL data contexts.

The qualitative data were derived on a quarterly basis from the participant colleges who completed quarterly reports, sent routine updates for a coded data spreadsheet, and descriptive information derived from meetings, surveys, and videoconferences. The data were also gathered and checked with quarterly site visits in addition to a stakeholder survey. The outcomes were derived from the TAACCCT requirements as specified in the RFA and the approved evaluation plan.

III. Implementation Findings

The implementation findings showed a very systematic, organized, and carefully structured intervention that evolved steadily at Southeast Community College (SCC). The implementation process and findings are carefully detailed and described in the full report. These findings include the following:

- Both the Geographic Information Systems (GIS) and the Precision Agriculture (PA) programs piloted a variety of innovative activities and resources, such as "success coaching," course "hybridization," capstone courses, and other carefully articulated activities and resources. Their work provided the other community college departments insights into how these innovations functioned and how they might be utilized in other contexts.

- SCC provided organized and coordinated logistical support for the GIS and PA staffs and their activities, ranging from office space, technical assistance, accounting services, recruiting connections and positive administrative supervision.

- The staffs of the GIS and PA programs were able to effectively design, coordinate and implement their curriculum, as well as the supporting and accompanying resources with a high degree of fidelity. This was an ongoing process that took considerable work and effort.

- The most significant problem in the project (and its evaluation process) was procuring employment, wage and retention data from the Nebraska Department of Labor (NDOL). Although the external

evaluation team worked periodically with NDOL in various meetings and email exchanges, policy restrictions limited the data exchanges to aggregated data only, making quantitative data analysis impossible for tracking those variables within the developing individual student data matrices, and limiting such wage and employment data to a subset of self-reported information.

- One of the key operational strengths of both the GIS and PA programs was the ability to systematically develop a standardized curriculum and find excellent instructional resources, and work together to operationalize those resources. A weakness in the program was the limited ability to gather individual employment, wage and retention data from NDOL as mentioned. Another was the turnover of Project Manager and PA Instructors; however the transitions were well managed.

IV. Participant Impacts & Outcomes – Precision Agriculture (PA) and Geographic Information Systems (GIS) programs

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**
Surveys/Phone Calls	*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***

Note:5 students opted out on the intake form; and 5 students did not sign form, that would have increased the total number of competers 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**
In Progress/Blank	***84***
Totals	**333**

Quantitative Table 12. Associate of Arts Degree Achieved

Student Achieved AA Degree	N
No	**118**
Yes	**131**
In Progress/Blank	***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 workers. 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 outcomes 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**

V. Conclusions

The Developmental Evaluation approach utilized by the external evaluators proved to be useful for an evolving, collaborative and complex program such as the Precision Agriculture (PA) and Geographic Information Systems (GIS) interventions. The Project Manager, Recruiter/Success Coach, Placement Specialist and department Deans and faculty 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 program as a

whole attempted a series of innovative activities, such as new online and simulation options, and the further partnering with a wide range of businesses, community organizations, and governmental agencies.

The activity that stood out as having the greatest potential of service to students for future projects was the student success coaching and engagement efforts. Students entering the program had a variety of needs that were not being addressed by conventional services. Having this "guide-on-the-side" was so important in helping them successfully navigate the PA and GIS certification programs. One of the limitations and challenges of the overall project was the limited duration of the grant itself, which entailed a relatively short time to hire staff, develop and implement the curriculum and gather any longitudinal data to fully analyze the impacts of the program. The Project Manager and external evaluators were also restricted in the analysis capabilities due to data policies of the Nebraska Department of Labor (NDOL), which only allowed for aggregated data on employment, wage increases and retention.

Three key lessons learned from the evaluation process included: 1) it is essential to have a source of wage and employment data that is able and willing to provide individual data so that appropriate analyses can be conducted; 2) the project has done a great job planning for sustainability and scaling into the processes from day one of the program, and that is certainly a model for other projects, and 3) evaluation of complex projects need a well-articulated quantitative and qualitative mixed methods approach, again as was demonstrated in this project. For future implications for projects such as these, it will be important for the evaluation team to work steadily and creatively to establish a detailed agreement with the relative State Departments of Labor. Without a workable state agreement to release individual employment, wage and retention data, causal analysis is challenging and substantially limited.