



# Training Precision for Agricultural Technicians Final Evaluation Report

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## Glossary of Statistical Terms

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**Effect size** – Measure of the strength of a relationship and most often referred to as a measure of practical significance and reported using Cohen’s  $d$ . It is calculated by taking the difference between the participant and comparison groups’ means and dividing that difference by the standard deviation of the comparison group’s scores or by the standard deviation of the aggregated scores of both groups. McREL researchers consider an effect size of 0.25 or greater to be educationally meaningful, and an effect size between 0.13 and 0.20 to be substantively important. These benchmarks are based on the What Works Clearinghouse’s methodological guidelines (U.S. Department of Education, 2014) and on a Lipsey et al. (2012) article, which reported an average effect size of 0.13 for 227 randomized controlled trials that examined the effect of curricula or broad instructional programs.

**$n$**  – The lower case  $n$  refers the number in a sample (as contrasted with the number in a population).

**Mean ( $M$ )** – The arithmetic average which is calculated by adding the values for each case and dividing by the total number of cases.

**$p$  value** – This term refers to the probability value or, in other words, the probability that a statistic could occur by chance or sampling error if the null hypothesis (i.e., no difference) is true.

**Statistical significance** – A finding is said to have statistical significance when the value or measure of a value is significantly larger or smaller than would be expected by chance alone.

**Standard deviation ( $SD$ )** – This is a descriptive measure of variability or spread of scores around the mean. The wider the scores are spread, the larger the standard deviation. The standard deviation is calculated by taking the square root of the variance.

**Student’s  $t$  distribution ( $t$ )** – A test for statistical significance that uses tables of a statistical distribution is called a Student’s  $t$  distribution. It is referred to as Student’s  $t$  because the author of the article that made this distribution well known used the pen name “Student.” In articles and reports, it is often referred to as simply “ $t$ .”

**$t$ -test** – A test of statistical significance which shows the differences between two group means.

## Executive Summary

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### TAACCCT Program/Intervention Description and Activities

In September 2012, Lake Region State College (LRSC) received approximately \$3 million from the U.S. Department of Labor (DOL) as part of the Round 2 Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program to create career pathways focused on precision agriculture and technology to support a statewide agriculture industry. LRSC then contracted with McREL International in October 2013 to serve as the third-party evaluator for the Training Precision for Agricultural Technicians (TPAT) project.

The goal of the TPAT project aimed to create career pathways focused on precision agriculture and technology to support a statewide industry that, in the short-term, needs half of its new hires to have basic knowledge of precision farming and half of its new hires to have specialized training in precision technologies (Dakota Center for Technology-Optimized Agriculture, 2011). To meet the industry's needs, LRSC faculty and staff conceived several TPAT design strategies that seek to address core elements of the TAACCCT grant and support an efficient, effective training program to prepare trade-impacted workers and other adults for agriculture positions requiring higher skill levels and offering higher wages. The TPAT project attended to each of the DOL's five priority areas with the activities summarized below.

In particular, the TPAT project's accelerated and modularized approach to education focused on the specialized topic of precision agriculture and the associated computer technology and electronics skills needed; human relations in the workplace was also a focus of skill development. This program structure supported flexibility, allowing students to enter and exit at various points and lattice to other training programs if desired.

#### Activities by DOL Priority Area

##### ***Priority 1: Use of Evidence-Based Design by the TPAT Program***

- Coordinate with North Dakota's job training and workforce centers, other employment agencies, the North Dakota Department of Veterans Affairs (ND DVA), and private sector partners to identify potential trainees
- Hire part-time regional cognitive tutors who buttress retention and achievement via prior learning assessments, advanced placement, and personal coaching during TPAT course instruction
- Place trainees in correct training/classes through the use of Accuplacer®, ACT WorkKeys®, and Tests of Adult Basic Education (TABE®) assessment tools
- Use learning communities to provide team-based learning and peer-to-peer assistance in coursework

- Integrate “mastery” modules of learning that contain contextualized STEM (science, technology, engineering, and mathematics) content into training program “blocks”
- Deploy staff within the LRSC Adult Learning Center and use TRIO student support services (TRIO-SSS) as needed by TPAT trainees
- Use individualized education action plans (EAPs) and structured follow-back

**Priority 2: Create and Use Stacked and Latticed Credentials**

- Engage precision agriculture industry partners and relevant academic program directors in the creation of plans for stacking and latticing
- Specify in writing the stacking steps and latticing
- Develop a prior learning assessment strategy for the TPAT program

**Priority 3: Use of Online and Technology-Enabled Learning**

- Design and build sophisticated online modules containing contextualized STEM content

**Priority 4: Develop and Implement All Transferability and Articulation Agreements**

- Review NDUS-sanctioned agreements
- Execute a Memorandum of Understanding between LRSC and North Dakota State University to complete a 1 x 2 x 4 articulation

**Priority 5: Strategically Align All Partners Within the TAACCCT Initiative so the Proposed TPAT Program Meets Industry Needs: (1) High Plains Production Agriculture and Entrepreneurial Sectors of Regional Economic Service Areas, (2) the Public Workforce System, (3) the ND DVA, (4) the DOL, and (5) Other Educational Institutions (and their nonprofit entities)**

- Sustain coordination with employers and industry
- Sustain coordination with the public workforce system
- Sustain outreach and coordination with educational institutions and the North Dakota STEM Network
- Contract for the conduct of an external evaluation

## Evaluation Design Summary

The overarching goal of the TPAT evaluation was to document and monitor implementation of the key components described in the TPAT Technical Proposal and to understand how the TPAT model worked to support the project’s goals. Implementation evaluation examined the extent to which the priority areas were addressed and if the program strategies were implemented as planned. The implementation evaluation was organized into four overarching formative evaluation:

1. How were the key strategies and activities of the TPAT project implemented?
2. To what extent were the key TPAT project strategies and activities implemented as planned?
3. What changes were made to the program of study during implementation and for what reasons?
4. To what extent is the TPAT program sustainable and transferable?

Additional subquestions were identified, including those required to be answered as a part of the DOL's Solicitation for Grant Applications (SGA).

With regard to the evaluation of the TPAT program's outcomes, McREL evaluators examined the extent to which the project impacted the target participant outcomes encompassing training, earning of certificates/degrees, and employment (i.e., nine key TAACCCT outcome measures). Additionally, evaluators measured a few intermediate outcomes (i.e., mediators, such as motivation and barriers to learning) that were intended to help the project team understand the underlying mechanisms explaining the associations between program implementation and its outcomes.

Five data collection methods were used to monitor and document the TPAT project's implementation including a partner survey, a review of project records, stakeholder interviews, student group interviews, and student surveys. To measure the program impact, students were invited to complete Student Entrance and Exit Surveys upon entry and exit of the Precision Agriculture AAS degree program. Both surveys included a series of questions about participants' motivation and barriers to learn, which have been adapted from the College Persistence Questionnaire (CPQ; Davidson et al., 2009). In addition to the CPQ items, the exit survey also included questions related to participants' perceptions and experiences with all aspects of the program activities (e.g., technology, networking opportunities, experiential learning experiences, and advising and coaching services).

The Student Entrance Survey was administered to Cohort 1 participants near the end of the first year of the two-year program. Cohort 2 participants completed the survey approximately two months after the beginning of the term they enrolled. A total of 47 Cohort 1 and 2 participants responded to the Student Entrance Survey. The Student Exit Survey was administered to Cohort 1 and 2 participants two to three weeks before they completed their program. A total of 28 participants completed the exit survey. Descriptive statistics were calculated for quantitative data and thematic analyses were conducted for qualitative data.

Year 3 was the final year for evaluating the TPAT program implementation. The Year 4 evaluation (October 1, 2015 – September 30, 2016) examined the impact of the project on participants as measured by pre and post surveys. This executive summary portrays a summary of



findings from the Year 3 annual evaluation report (Good & Knotts, 2015) and findings from the participant impacts and outcome study completed in Year 4.

## **Implementation Findings**

A summary of the findings for each of the implementation evaluation questions are presented below.

### **How were the key strategies and activities of the TPAT project implemented?**

The key findings of the TPAT project's progress at the conclusion of Year 3 (i.e., end of the TPAT implementation) are highlighted as follows.

#### ***Development of Comprehensive Precision Agriculture Curricula:***

- Curricula have been implemented as planned with minor adjustments to meet students' needs. Faculty members assess the interests and background knowledge of their students to tailor the content to their needs in order for them to successfully complete the program and succeed in the workforce. Student feedback following their internships and other experiential learning opportunities also contribute to ensuring that a comprehensive curriculum is being offered that focuses on the specific content and skills required of students completing the program.
- Technology plays a major role in contextualizing content in the TPAT project. Faculty members provide exposure to various technologies and equipment utilized in precision agriculture to prepare students for the tasks required in their future careers.

#### ***Development of Comprehensive Student Support Services:***

- The cognitive tutoring coach funded by the TAACCCT grant has been identified as a major proponent of success in supporting the TPAT students. Faculty, project leaders, and students alike voiced that this staff member supplied tutoring and academic advising while tracking students' progress and communicating with faculty about student needs. Faculty and partners are also credited for providing students with support services (e.g., career guidance).
- The TRIO-SSS has and will continue to be available to students seeking academic support once the TAACCCT funding ceases. Faculty indicated that the services support students with tutoring, advising, and career guidance.

### ***Development of Online and Technology-Enabled Learning:***

- The curriculum design coordinator has worked with faculty members to create online modules for their web-based courses. The modules include electronic notes, recorded lectures, presentation slides, and simulation labs.
- Many courses have online components, whether offered entirely online or as a hybrid model (i.e., online and in-person). TPAT project staff shared their hope to transfer the program to being offered fully online.

### ***Strategic Alignment with Partners in Industry and Workforce:***

- Partners have been involved in several ways including loaning equipment and technology for the TPAT program to utilize as well as providing course lectures and training to both students and faculty on agriculture equipment, software, and technology. In addition, partners have informed students of workforce needs and effective strategies in gaining employment.
- Based on findings from the project staff interviews and partner survey results, the partners have provided positive feedback regarding their involvement and the program's ability to train quality workers in agricultural fields.

### ***Development of a Successful Recruitment Strategy:***

- TPAT leaders have actively recruited for the precision agriculture program via mediated communication (i.e., magazine articles and infomercials), conferences, expos, and word of mouth.
- The number of students in Cohorts 1 and 2 were at the project targets. However, the number of TAA-eligible and veteran students was lower than proposed. The favorable economy in North Dakota was referenced as an explanation for the less-than-desired TAA-eligible enrollment.
- Strategies to increase enrollment in specific targeted groups were implemented. For instance, project staff have contacted Job Search North Dakota in an attempt to increase TAA-eligible student enrollment. TPAT staff have also partnered with Veterans Education Training to recruit returning veterans who may want to receive training in the classroom or via online.

## **To what extent were the key TPAT project strategies and activities implemented as planned?**

The fidelity of implementation was measured using three dimensions cited in implementation science literature: adherence, quality, and participant responsiveness (Century, Rudnick, & Freeman, 2010; Dane & Schneider, 1998; Fixsen, Naoom, Blase, Friedman, & Wallace, 2005; Mowbray, Holter, Teague, & Bybee, 2003). Key findings for each dimensional aspect are presented below.

**Adherence:** Adherence refers to the extent to which the critical components of an intended program are present when the program is enacted.

- At the start of the TPAT project, 30 deliverables were identified in the project's work plan. These deliverables are organized around the five priority areas, with a sixth area focusing on activities related to the project's start-up. For this Year 3 evaluation report, more than two thirds of the deliverables have been identified as ongoing; all seven of the start-up related deliverables are complete; and two deliverables have yet to be started (i.e., the written stacking plan/written latticing plan and the North Dakota University System [NDUS] problem report).

**Quality:** Quality measures the qualitative aspects of program delivery that are not directly related to the implementation of prescribed content.

- For this project, indicators of quality (i.e., technology use, instruction, and academic advising) have been measured through student responses to the entrance and exit surveys. Using a 5-point Likert-type scale, Cohort 2 participants gave these Student Entrance Survey items average ratings of 3.95 to 4.55 while Cohort 1 participants gave similar items on the Student Exit Survey average ratings of 2.38 to 3.63.
- For both cohorts, satisfaction was highest with the academic advising items and lowest with technology use.
- Project partners indicated on the Partner Survey that they have moderately high perceptions of the quality of the key project components with average ratings ranging from 3.50 to 4.00 on a 5-point scale.

**Responsiveness:** Respondents' level of satisfaction with the TPAT program serves as an indicator for whether project staff have been responsive to the participants.

- On average, Cohort 2 students rated their level of satisfaction as 4.19 on a 5-point scale, whereas Cohort 1 students rated their level of satisfaction as 2.63.
- The likelihood of TPAT participants recommending the program to friends or other prospective students received an average rating of 4.19 on a 5-point scale for those students enrolled in Cohort 2 while Cohort 1 students provided an average rating of 2.63.
- In addition, partners said they would *likely* or *very likely* recommend the program to others with whom they collaborate (average rating of 4.30 on a 5-point scale).
- While TPAT partners generally rated their level of engagement in the key project components and activities as relatively low (average ratings of 1.29 to 2.71 on a 5-point

scale). They did report having satisfaction with TPAT project staff members' efforts to engage them in the project (3.71 on a 5-point scale).

## **What changes were made to the programs of study during implementation and for what reasons?**

- Based on the project record review and interviews with TPAT project staff, the biggest changes occurred during the project planning year and only minor adjustments have occurred to the program's implementation since then.
- In Year 1, there was a reevaluation and redesign of the program curricula from the originally proposed "mastery" learning blocks or modules to structuring the program into a two-year AAS degree. This change was made after prompting from the advisory committee.
- Adjustments that have been made during program implementation (i.e., Years 2 and 3) were made to better address student needs. During the first program implementation year, challenges occurred with ensuring that the content met students' needs in regard to relevant and comprehensive knowledge required for career application.
- Additionally, student feedback after their internships was used to better understand which content and practical skills should be incorporated more heavily into the curricula. Students' experiences and perceptions of their preparedness for the internships and their careers offered faculty insight into the areas in which they expressed that they needed more instruction.

## **To what extent is the TPAT program sustainable and transferable?**

- Given the workforce demand for precision agricultural technicians, TPAT project staff and partners indicated that the program will be sustainable.
- However, sustaining a program requires resources and necessitates continued collaboration with partners as well as identifying and securing financial supports. Industry partners have supplied support with equipment and technology, curriculum design, and instruction throughout the program.
- Graduates of the precision agriculture program are equipped with the knowledge and skills to enter the workforce. Additionally, LRSC has provided both non-credit and credit-bearing continuing education courses to local producers as part of the TPAT project.
- However, the main challenge identified in the sustainability plan is the loss of the DOL funding once the grant period ends. TPAT project leaders and staff have actively sought new financial support (i.e., grants and endowments) to aid future implementation. With the cessation of grant implementation funds in September 2015, TPAT project leaders sought

alternative methods for filling positions currently funded by the grant. Although TPAT project leaders acknowledge that the program is expensive, they note that it is bringing in revenue online as well as through student enrollment (e.g., tuition, room and board, and financial aid).

- An articulation agreement with North Dakota State University has been established for transferring credits that a student earns as part of the TPAT program to a program at the university. In the proposal (LRSC, 2012), it was predicted that students intending to continue their education would most likely transfer into agriculture and biosystems engineering programs at the College of Agriculture at North Dakota State University. However, faculty and staff realized that students are often transferring into agronomy and crop science majors instead. Therefore, LRSC aims to form articulation agreements with those departments in the future to meet students' educational goals.

## Participant Impacts and Outcomes

- Overall, students enrolled in the TPAT program at LRSC tended to have consistent perceptions of persistence and retention related survey constructs from the beginning of the program to the end.
- Cohort 1, on average, assigned neutral to somewhat positive ratings for each category, with financial strain yielding the least favorable rating. By the end of the program, Cohort 1 rated career integration significantly lower than previously rated at the beginning of the program. These findings may be consistent with a sense of unpreparedness for the workforce as they complete their training program and pursue careers in their field. Primarily, students indicated that they no longer felt confident that their training they received would help them get the job they want.
- Students from Cohort 2 reported positive perceptions toward the majority of retention related survey constructs. They experienced some financial strain, which contributed to worries about having enough money to meet their needs or their ability to handle college costs.
- Cohort 2 exuded confidence that they could complete coursework successfully to receive not only the necessary skills and knowledge but to also earn the grades they desire. They also believed the training program would prepare them for the jobs they want.
- Findings revealed that Cohort 2 reported more positive ratings of all retention survey constructs (i.e., academic efficacy, career integration, academic integration, advising effectiveness, financial strain and grit) than those of Cohort 1. Ratings were significantly higher for career integration, academic integration, advising effectiveness, and financial strain.

- Students' perceptions of technology were more favorable among Cohort 2 respondents than Cohort 1 respondents. The differences between the cohorts' ratings regarding the use of state-of-the-art labs and equipment and the use of technology to facilitate their learning experience yielded statistical significance.
- The aforementioned trends continued into students' perceptions of experiential learning opportunities, networking opportunities, and advising experiences as Cohort 2 reported more favorable results than Cohort 1 respondents.
- Specifically, Cohort 2 identified more opportunities to network with professionals and potential employers, and their perceptions about the quality of experiential learning opportunities were higher. Students in Cohort 2 were also more satisfied than Cohort 1 when reflecting on the opportunities for experiential learning as well as the quality and frequency of services received from advisors.
- The TPAT program was successful with its recruitment and retaining of participants. The number of unique participants served exceeded the projected number of participants that was stated in the proposal.

In general, the results indicate that adjustments and refinements made by program staff may have improved students' perceptions of and experiences in the TPAT program. What is also important in the interpretation of the findings is that Cohort 1 students differed in a number of characteristics that may have contributed to the variances in responses between Cohort 1 and 2. Cohort 1 had a higher number of nontraditional students who had prior work experiences (although not in the agricultural field) and required a number of supports and resources available through LRSC that facilitated their successful completion of the TPAT program. These extraneous variables may account for some variance in the differences between the two groups. Comparisons between Cohorts 1 and 2 should be made with caution. However, program staff can use the findings from this report as they continue to make program improvements to ensure training and support meets the needs of students in achieving academic and professional success.

## Conclusions

The following conclusions are offered for other TAACCT grantees and evaluators to help them in understanding the challenges that McREL evaluators have encountered when evaluating TAACCCT grants as well as some of the successes. The challenges and successes reflect McREL's experiences in the evaluation of multiple Rounds 2 and 3 TAACCCT projects.

## Challenges

- Getting data sharing agreements established has been a huge issue. Discussions of data sharing expectations, logistics, and costs should have been discussed as proposals were being developed. Not only do some states not permit the sharing of data, but in states that do there have been misunderstandings about what is possible and for what fees. This has taken considerable time to address and in some situations data sharing agreements were still unable to be established.
- More recently (June 2016) it was made known that other data sources are permissible for reporting on the outcome indicators. It would have been ideal to have this information as structures and processes were being established for data collection (i.e., Year 1 of a TAACCCT grant).
- An expectation of TAACCCT evaluations was to employ either an experimental or quasi-experimental design. Experimental designs were not permissible for TAACCCT evaluations McREL conducted due to the fact grantees could not (colleges would not permit) random selection of who could participate in the grant. Quasi-experimental designs were proposed in the evaluation plan (e.g., comparison with students in similar programs at same college or students in same programs at a non-TAACCCT college). Securing data from comparison students was virtually impossible due to limited resources and time required to communicate with other colleges and secure their buy-in. Therefore, often times we reverted to a historical cohort. However, there were limits in the type of data available for that comparison group and the meaningfulness of any conclusions that could be drawn from an impact study.

## Successes

- Engaging the project staff in the evaluation and ongoing communication of expectations and their roles is important. A kick-off evaluation meeting with project staff is valuable. It is beneficial for articulating expectations to stakeholders, establishing a common understanding of the evaluation, and helping stakeholders understand the value and purpose of evaluation.
- Defining key project staff's roles and expectations with respect to the evaluation aids in data collection, quality of data obtained, aptness of project staff to use the evaluation findings, and the overall commitment in supporting the evaluation.
- As an organization that is evaluating more than one TAACCCT, it has been advantageous to build upon economies of scale. Internally evaluators have learned from each other's projects and used common evaluation methods and scales. It would have been valuable to have all TAACCCT evaluators convene for at least one national meeting as proposed in the SGA. These types of meetings would have built a community of learners that would have

permitted each of us to share what was learned with the evaluations, instruments and processes as well as facilitated networking with one another.

The following suggestion is made for further study of TAACCT projects and their long term outcomes.

- Consider funding studies to longitudinally track a sample of participants to examine long-term outcomes and likewise study sustainability of the TAACCCT funded programs at a sample of colleges.



## Introduction

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In September 2012, Lake Region State College (LRSC) received approximately \$3 million from the U.S. Department of Labor (DOL) as part of the Round 2 Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant program to create career pathways focused on precision agriculture and technology to support a statewide agriculture industry. The targeted, hybrid education opportunities that are available through the Training Precision for Agricultural Technicians (TPAT) project are designed to provide a diverse group of North Dakotans with the unique skills required by agricultural companies around the state and help develop a workforce equipped to excel in technology-based agriculture positions.

The goal of the TPAT project aimed to create career pathways focused on precision agriculture and technology to support a statewide industry that, in the short-term, needs half of its new hires to have basic knowledge of precision farming and half of its new hires to have specialized training in precision technologies (Dakota Center for Technology-Optimized Agriculture, 2011). To meet the industry's needs, LRSC faculty and staff conceived several TPAT design strategies that seek to address core elements of the TAACCCT grant and support an efficient, effective training program to prepare trade-impacted workers and other adults for agriculture positions requiring higher skill levels and offering higher wages. The TPAT project attended to each of the DOL's five priority areas with the activities summarized below.

In particular, the TPAT project's accelerated and modularized approach to education focused on the specialized topic of precision agriculture and the associated computer technology and electronics skills needed; human relations in the workplace was also a focus of skill development. This program structure supported flexibility, allowing students to enter and exit at various points and lattice to other training programs if desired.

### **Activities by DOL Priority Area**

#### ***Priority 1: Use of Evidence-Based Design by the TPAT Program***

- Coordinate with North Dakota's job training and workforce centers, other employment agencies, the North Dakota Department of Veterans Affairs (ND DVA), and private sector partners to identify potential trainees
- Hire part-time regional cognitive tutors who buttress retention and achievement via prior learning assessments, advanced placement, and personal coaching during TPAT course instruction
- Place trainees in correct training/classes through the use of Accuplacer®, ACT WorkKeys®, and Tests of Adult Basic Education (TABE®) assessment tools
- Use learning communities to provide team-based learning and peer-to-peer assistance in coursework
- Integrate "mastery" modules of learning that contain contextualized STEM (science, technology, engineering, and mathematics) content into training program "blocks"

- Deploy staff within the LRSC Adult Learning Center and use TRIO student support services (TRIO-SSS) as needed by TPAT trainees
- Use individualized education action plans (EAPs) and structured follow-back

**Priority 2: Create and Use Stacked and Latticed Credentials**

- Engage precision agriculture industry partners and relevant academic program directors in the creation of plans for stacking and latticing
- Specify in writing the stacking steps and latticing
- Develop a prior learning assessment strategy for the TPAT program

**Priority 3: Use of Online and Technology-Enabled Learning**

- Design and build sophisticated online modules containing contextualized STEM content

**Priority 4: Develop and Implement All Transferability and Articulation Agreements**

- Review NDUS-sanctioned agreements
- Execute a Memorandum of Understanding between LRSC and North Dakota State University to complete a 1 x 2 x 4 articulation

**Priority 5: Strategically Align All Partners Within the TAACCCT Initiative so the Proposed TPAT Program Meets Industry Needs: (1) High Plains Production Agriculture and Entrepreneurial Sectors of Regional Economic Service Areas, (2) the Public Workforce System, (3) the ND DVA, (4) the DOL, and (5) Other Educational Institutions (and their nonprofit entities)**

- Sustain coordination with employers and industry
- Sustain coordination with the public workforce system
- Sustain outreach and coordination with educational institutions and the North Dakota STEM Network
- Contract for the conduct of an external evaluation

LRSC contracted with McREL International in October 2013 to serve as the third-party evaluator for the TPAT project. McREL’s evaluation focused on project implementation in Years 2 and 3. The annual evaluation reports in those two years summarize findings from the formative evaluation (Good & Knotts, 2015; Good & Lane, 2014). In Year 4, the evaluation examined the impact of the project on participants as measured by surveys. The purpose of this final evaluation report is to share the findings of pre and post surveys completed by participants<sup>1</sup> who have completed their program of study (i.e., Cohorts 1 and 2). A summary of implementation findings is included in Appendix A. A summary of the TPAT’s performance relative to the DOL TAACCCT participant outcomes is contained in Appendix B.

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<sup>1</sup> The terms participants and students are used interchangeably throughout the report.

## Methods and Analysis

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Upon entry and exit of the Precision Agriculture AAS degree program, students were invited to complete the Student Entrance and Exit Surveys. Both surveys included a series of questions about participants’ motivation and barriers to learn, which have been adapted from the College Persistence Questionnaire (CPQ; Davidson et al., 2009). The 30-item short version of the CPQ, validated with community and technical college populations, assesses constructs that are associated with college retention and persistence, including (1) academic integration, (2) financial strain, (3) advising, (4) scholastic conscientiousness, (5) academic motivation, and (6) academic efficacy. Additionally, McREL evaluators collaborated with the developers of the CPQ to create two additional constructs—Career Integration and Grit—that were also found to be relevant to adult learners’ persistence and retention in postsecondary education (Bremer et al., 2011). Each construct consists of three to six survey items. A construct rating is computed by adding the individual ratings for each item and dividing by the number of items forming the construct. Each of the CPQ items utilized a five-point scale and a *not applicable* response option. A higher score denotes a more favorable response. In addition to the CPQ items, the exit survey also included questions related to participants’ perceptions and experiences with all aspects of the program activities (e.g., technology, networking opportunities, experiential learning experiences, and advising and coaching services). The Student Exit Survey utilized is included in Appendix C.

The Student Entrance Survey was administered to Cohort 1 participants near the end of the first year of the two-year program. Cohort 2 participants completed the survey approximately two months after the beginning of the term they enrolled. A total of 47 Cohort 1 and 2 participants responded to the Student Entrance Survey (Table 1). The Student Exit Survey was administered to Cohort 1 and 2 participants two to three weeks before they completed their program. A total of 28 participants completed the exit survey, as shown in Table 2. Analyses of the quantitative data gathered through the two surveys involved the calculation of descriptive statistics such as frequencies, percentages, and measures of central tendency and dispersion (e.g., means and standard deviations). Independent t-tests were performed to analyze the differences between the Cohort 1 and 2 responses. Responses to the entrance and exit survey responses were matched at the student level and paired samples t-tests were used to examine change between each cohort’s entrance and exit survey responses. Statistical significance was examined using *p* values. Effect sizes were computed to examine practical significance and reported using Cohen’s *d*.

**Table 1. Participant Entrance Survey Response Rate by Cohort**

Cohort	Administration Date	# of Participants Invited	# of Participant Responses	Response Rate
1	May 2014	28	26	92.9%
2	October 2015	19	19	100.0%
2*	March 2015	5	2	40.0%
<b>Total</b>		<b>52</b>	<b>47</b>	<b>90.4%</b>

\*A small number of students started the program in spring 2015.

**Table 2. Participant Exit Survey Response Rate by Cohort**

Cohort	Administration Date	# of Participants Invited	# of Participant Responses	Response Rate
I*	May 2015	18	8	44.4%
I	December 2015	4	4	100%
2	April 2016	21	16	76.0%
<b>Total</b>		<b>43</b>	<b>28</b>	<b>65.1%</b>

\*Not all Cohort I participants were present the day the Exit Survey was administered. The survey was administered to Cohort I participants exiting the program in May 2015 as well as those planning to exit the program in December 2015.

## Findings

For the CPQ items, an analysis of the changes in each of Cohort 1 and 2 respondents' perceptions from the two survey administration points are presented (i.e., entrance and exit of the program). Also included are findings from the Student Exit Survey administered to both Cohorts 1 and 2. Results are presented separately for each cohort due to the differences in results. Overall, Cohort 2 respondents had more favorable responses than the Cohort 1 respondents. A possible explanation for these differences is that the program was newly started in 2013, making the Cohort 1 respondents the first enrollees. Program adjustments and refinements were made based on lessons learned with this first cohort. Cohort 2 responses may be indicative of program improvements to career and academic integration, for example, which enhanced respondents' perceptions of the training and content relativity for their professional practice upon completion of the program. The following sections will highlight the findings from each cohort as well as cross-cohort comparisons.

### Entrance and Exit Survey Responses by Cohort

#### Cohort 1

Summarized in this section are the findings for Cohort 1 on the six constructs related to persistence and retention. As shown in Table 3, respondents indicated that grit (i.e., motivation to complete tasks and earn a degree) was rated the highest category at both the beginning ( $M=4.32, SD=0.57$ ) and end ( $M=4.07, SD=0.68$ ) of the program. At the beginning of the program, Cohort 1 respondents had a higher rating for the career integration construct at the point the entrance survey was administered ( $M=3.91, SD=0.57$ ) than compared to the end ( $M=3.29, SD=0.85$ ). **Perceptions of career integration significantly decreased toward the end of the program** ( $t(10)=3.01, p=0.013; ES=0.86$ ). Overall, there were no other significant differences amongst the Cohort 1 respondents' construct ratings from the entrance to the exit survey.

**Table 3. Cohort 1 Changes in Perceptions of Persistence and Retention Related Constructs**

Constructs	Entrance Survey			Exit Survey			Paired-sample t-tests			
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>ES</i>
Academic Efficacy	12	3.89	0.78	12	3.75	0.84	0.49	11	0.636	0.17
Career Integration	11	3.91	0.57	11	3.29	0.85	3.01	10	0.013*	0.86
Academic Integration	11	3.15	1.32	11	2.76	1.26	1.13	10	0.284	0.30
Advising Effectiveness	10	3.73	0.98	10	3.53	1.15	0.68	9	0.515	0.19
Financial Strain	8	2.28	1.35	8	2.53	0.99	-1.13	7	0.296	-0.21
Grit	11	4.32	0.57	11	4.07	0.68	1.19	10	0.262	0.40

Note. The CPQ items used a five-point scale. A high mean score indicates better outcomes. Effect size (*ES*) estimating of the magnitude of differences over time is reported using the Cohen's *d* statistic (Ferguson, 2009; Lipsey et al., 2012).

\* $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$

Cohort 1 responses by each of the individual survey items are shown in Table 4. Cohort 1 tended to assign positive ratings to many of the persistence retention constructs presented on the entrance and exit surveys. Three items specifically measured **academic efficacy**. The respondents indicated that they were confident in earning the grades they wanted and they felt their assignments were acceptable upon submission. Cohort 1 participants experienced some to little doubt regarding their ability to achieve their desired grades. There were no significant differences in respondents' ratings of academic efficacy items over time.

**Career integration** was measured using six items. On both the entrance and exit surveys, Cohort 1 respondents expressed that they are committed to obtaining a job in the field in which they are training. Additionally, Cohort 1 indicated that their career is a key component of their identity. These results were consistent from the beginning of the program to the end. Respondents expressed confidence in gaining the necessary knowledge and skills through the TPAT program both on the entrance and exit surveys. Cohort 1 respondents were more likely to think what they are learning at the school is irrelevant at the end of the program than the beginning, but the differences were not significant. There was no change in the respondents' ratings to how much they know about the duties and responsibilities of the career and field in which they are receiving training between the two points the survey was administered. At the beginning of the program, Cohort 1 felt the training was likely to assist them in earning the job they want ( $M=4.17$ ,  $SD=0.84$ ). However, their **perceptions of the training effectiveness for gaining desired employment at the end of the program decreased** ( $M=2.92$ ,  $SD=1.51$ ). This was a **significant difference** from entrance to exit survey ( $t(11)= 2.61$ ,  $p=0.02$ ,  $ES=1.02$ ).

Three items each measured Cohort 1 respondents' perceptions of **academic integration** and **advising effectiveness**. They reported that the quality of instruction was fair when entering and exiting the program. Cohort 1 respondents feel somewhat capable of completing work successfully thanks to instructors and courses, with the same mean rating on both the entrance and exit survey. In general, respondents indicated they were *neither satisfied nor dissatisfied* with the quality of instruction at the beginning of the program but they became more dissatisfied by the end of the program. Additionally, Cohort 1 respondents were between *neutral* and *somewhat satisfied* with the academic advising they received with the same mean rating on both the entrance and exit surveys. They found it was somewhat easy to get answers to their questions related to their education and training towards the end of the training. Respondents also rated the academic advisement as *fair* on the entrance and exit surveys. None of the items for the academic integration and advising effectiveness constructs were significant.

Cohort 1 respondents also rated four items pertaining to **financial strain**. At the beginning of the program, they reported that they *rarely* worry about having enough money to meet their needs and found it *somewhat difficult* for them or their families to be able to afford the cost of college. Cohort 1 respondents also stated that they sometimes felt unable to afford things that other students can pay to do and there was *somewhat of a strain* to purchase their essential resources for courses. There were slight variations in the respondents' ratings by the end of the program; however, the only **significant difference was the increase in respondents' perception of financial strain to purchase resources such as books and supplies** ( $t(8)= -2.29$ ,  $p=0.05$ ,  $ES=-0.45$ ). Respondents' ratings decreased from the entrance to exit survey meaning they were less likely to perceive financial strain to purchase resources.

Lastly, Cohort 1 rated four items on their persistence to complete the program (i.e., **grit**). Respondents indicated on both the entrance and exit surveys that they are likely to very likely to finish whatever they begin. They also reported that they are likely to very likely to remain interested in activities and continue working on projects or tasks that require more a few months to complete. There were **significant differences in respondents likelihood to complete tasks in spite of setbacks** ( $t(10)=2.63$ ,  $p=0.03$ ,  $ES=0.64$ ). Respondents indicated lower levels of likelihood at the time the exit survey was given, but the ratings still indicated a positive grit score.

**Table 4. Cohort I Constructs Associated with Retention<sup>2</sup>**

Survey Items	Entrance Survey			Exit Survey			Paired-sample t-tests			
	n	M	SD	n	M	SD	t	df	p	ES
<b>Academic Efficacy</b>										
How confident are you that you can get the grades you want?	12	4.00	0.95	12	3.58	1.38	0.92	11	0.376	0.35
When you are waiting for a submitted assignment to be graded, how assured do you feel that the work you have done is acceptable?	12	4.00	0.85	12	3.92	0.90	0.29	11	0.777	0.09
How much doubt do you have about being able to make the grades you want?	12	3.67	1.07	12	3.75	1.06	-0.25	11	0.809	-0.08
<b>Career Integration</b>										
How likely is it that the training you are receiving here will help you to get the job you want?	12	4.17	0.84	12	2.92	1.51	2.61	11	0.024*	1.02
How confident are you that the career training you receive here will give you the necessary knowledge and skills?	12	3.42	1.17	12	2.92	1.08	1.92	11	0.082	0.44
How much of what you are learning at this school do you think is irrelevant?	11	3.45	0.93	11	2.82	0.60	2.06	10	0.067	0.81
How much do you know about the duties and responsibilities of the career and field in which you are receiving training?	11	3.18	0.98	11	3.18	1.08	0.00	10	1.000	0.00
How committed are you to getting a job in the field for which you are training?	11	4.55	0.82	11	3.73	1.35	1.70	10	0.121	0.73

<sup>2</sup> Adapted from Davidson, W. B., Beck, H., & Milligan, M. (2009). The College Persistence Questionnaire: Development and validation of an instrument that predicts student attrition. *Journal of College Student Development*, 50, 373-390.

Survey Items	Entrance Survey			Exit Survey			Paired-sample t-tests			
	n	M	SD	n	M	SD	t	df	p	ES
How important is it for you to think of your career as a key part of your identity?	11	4.45	0.93	11	4.27	0.79	0.80	10	0.441	0.21
<b>Academic Integration</b>										
How would you rate the quality of the instruction you are receiving here?	11	3.27	1.19	11	3.09	1.45	0.48	10	0.640	0.12
How much do the instructors and courses make you feel like you can do the work successfully?	11	3.09	1.58	11	3.09	1.45	0.00	10	1.000	0.00
In general, how satisfied are you with the quality of instruction you are receiving here?	11	3.09	1.45	11	2.55	1.44	1.11	10	0.294	0.37
<b>Advising Effectiveness</b>										
How satisfied are you with the academic advising you receive here?	10	3.50	1.08	10	3.50	1.18	0.00	9	1.000	0.00
How easy is it to get answers to your questions about things related to your education and training here?	11	4.00	1.00	11	3.55	1.51	1.61	10	0.138	0.35
How would you rate the academic advisement you receive here?	11	3.55	0.93	11	3.55	0.82	0.00	10	1.000	0.00
<b>Financial Strain</b>										
How often do you worry about having enough money to meet your needs?	9	2.44	1.74	9	2.78	1.09	-1.00	8	0.347	-0.23
How difficult is it for you or your family to be able to handle college costs?	8	2.25	1.39	8	2.38	1.30	-0.42	7	0.685	-0.10
When considering the financial costs of being in college, how often do you feel unable to do things that other students here can afford to do?	9	2.67	1.50	9	2.78	1.09	-0.36	8	0.729	-0.08
How much of a financial strain is it for you to purchase the essential resources you need for courses such as books and supplies?	9	2.33	1.23	9	2.89	1.27	-2.29	8	0.051*	-0.45
<b>Grit</b>										
When you experience setbacks on tasks that are important to you, how likely are you to complete those tasks?	11	4.55	0.69	11	4.00	1.00	2.63	10	0.025*	0.64



Survey Items	Entrance Survey			Exit Survey			Paired-sample t-tests			
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>ES</i>
How likely are you to finish whatever you begin?	11	4.91	0.30	11	4.73	0.65	0.80	10	0.441	0.36
How typical is it for you to be very interested in an activity and then lose interest a short time later?	11	3.64	1.43	11	3.82	1.17	0.36	10	0.724	-0.14
How likely are you to keep working on projects or tasks that require more than a few months to complete?	11	4.18	0.98	11	3.73	0.91	1.10	10	0.296	0.48

Note. The CPQ items used a five-point scale. A high mean score indicates better outcomes. Effect size (*ES*) estimating of the magnitude of differences over time is reported using the Cohen's *d* statistic (Ferguson, 2009; Lipsey et al., 2012).

\**p* ≤ .05, \*\* *p* ≤ .01, \*\*\* *p* ≤ .001

## Cohort 2

Cohort 2 was also asked to rate their perceptions of persistence and retention related constructs at the start and end of the program (Table 4). Respondents rated items pertaining to academic integration, advising effectiveness and career integration highest among the six constructs (Table 5). Academic integration was rated highest at the beginning of the program (*M*=4.40, *SD*=0.54), while advising effectiveness (*M*=4.29, *SD*=0.92) and academic efficacy (*M*=4.28, *SD*=0.80) were the top rated constructs at the end of the program. Career integration received a mean score of 4.21 on both the entrance and exit surveys (*SD*=0.61 and *SD*=0.52, respectively). **There were no significant differences within Cohort 2 ratings from the beginning of the program (i.e., entrance survey) to the end of the program (i.e., exit survey).**

**Table 5. Cohort 2 Changes in Perceptions of Persistence and Retention Related Constructs**

Constructs	Entrance Survey			Exit Survey			Paired-sample t-tests			
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>	<i>ES</i>
Academic Efficacy	13	3.97	0.69	13	4.28	0.80	-1.95	12	0.075	-0.42
Career Integration	12	4.21	0.61	12	4.21	0.52	0.00	11	1.000	0.00
Academic Integration	14	4.40	0.54	14	4.10	0.78	1.38	13	0.192	0.45
Advising Effectiveness	14	4.36	0.65	14	4.29	0.92	0.35	13	0.736	0.09
Financial Strain	13	3.62	0.94	13	3.79	1.06	-1.03	12	0.324	-0.17
Grit	13	3.94	0.69	13	3.79	0.82	0.94	12	0.367	0.20

Note. The CPQ items used a five-point scale. A high mean score indicates better outcomes. Effect size (*ES*) estimating of the magnitude of differences over time is reported using the Cohen's *d* statistic (Ferguson, 2009; Lipsey et al., 2012).

\**p* ≤ .05, \*\* *p* ≤ .01, \*\*\* *p* ≤ .001

Cohort 2 responses by each of the individual survey items are shown in Table 6. Ratings for most constructs tended to be positive. **Findings were consistent from the beginning to the end of the program as there were no significant changes across any item scores.**

In regard to **academic efficacy**, Cohort 2 respondents expressed confidence in their ability to get the grades they desired, which was also confirmed by low levels of doubt in regard to their grades. When they submitted their work, respondents' entrance and exit survey results also show they believed their work was acceptable. Results also show positive ratings of **career integration**. Cohort 2 indicated they are committed to getting a job in their training field. They also expressed that their career is an important part of their identity, and they are confident that the training will provide them with the necessary knowledge and skills, according to mean ratings on the entrance and exit surveys.

Respondents had positive perceptions of the **academic integration** in their programs as well. Cohort 2 respondents reported that they received high quality instruction, and instructors and courses often make them feel like they can do their work successfully. In general, Cohort 2 respondents were satisfied with the quality of instruction at the beginning and end of the program. **Advising effectiveness** also received positive ratings on the entrance and exit surveys. Cohort 2 respondents reported satisfaction with the academic advising they received, and the respondents feel they can get answers to questions related to their education and training. Additionally, Cohort 2 respondents rated the quality of academic advisement as *good* with the same mean score on both the entrance and exit surveys.

Cohort 2 respondents identified some **financial strain** in managing the costs associated with their college enrollment and completion of courses. The respondents worry about having enough money at times, and they experience some difficulty while handling college costs. Cohort 2 respondents also reported feeling that, at times, they are unable to do things others can afford to do. Some of the financial strain comes from purchasing the necessary resources for their courses (e.g., books and supplies).

Cohort 2 respondents have high levels of **grit** as evidenced by responses to the four items comprising the grit construct. They are highly likely to finish whatever they begin and to complete tasks even after experiencing setbacks. Cohort 2 respondents indicated that they rarely lose interest in an activity that is important to them, and they continue working on tasks that require more than a few months to complete.

**Table 6. Cohort 2 Constructs Associated with Retention<sup>3</sup>**

Survey Items	Entrance Survey			Exit Survey			Paired-sample t-tests			
	n	M	SD	n	M	SD	t	df	P	ES
<b>Academic Efficacy</b>										
How confident are you that you can get the grades you want?	15	4.00	1.07	15	4.13	1.13	-0.38	14	0.709	-0.12
When you are waiting for a submitted assignment to be graded, how assured do you feel that the work you have done is acceptable?	15	4.07	0.70	15	4.20	1.01	-0.52	14	0.610	-0.15
How much doubt do you have about being able to make the grades you want?	14	4.00	0.96	14	4.43	0.65	-2.12	13	0.054	-0.52
<b>Career Integration</b>										
How likely is it that the training you are receiving here will help you to get the job you want?	15	4.47	0.64	15	4.40	0.83	0.27	14	0.792	0.09
How confident are you that the career training you receive here will give you the necessary knowledge and skills?	15	4.53	0.64	15	4.47	0.74	0.29	14	0.774	0.09
How much of what you are learning at this school do you think is irrelevant?	14	3.43	1.28	14	3.50	1.16	-0.16	13	0.873	-0.06
How much do you know about the duties and responsibilities of the career and field in which you are receiving training?	14	3.64	1.22	14	4.07	0.73	-1.88	13	0.082	-0.43
How committed are you to getting a job in the field for which you are training?	15	4.67	0.72	15	4.47	1.25	0.494	14	0.629	0.20
How important is it for you to think of your career as a key part of your identity?	15	4.53	0.64	15	4.47	0.92	0.24	14	0.818	0.08
<b>Academic Integration</b>										
How would you rate the quality of the instruction you are receiving here?	15	4.53	0.64	15	4.33	0.82	0.82	14	0.424	0.27
How much do the instructors and courses make you feel like you can do the work successfully?	15	4.40	0.63	15	4.33	0.82	0.27	14	0.792	0.10

<sup>3</sup> Adapted from Davidson, W. B., Beck, H., & Milligan, M. (2009). The College Persistence Questionnaire: Development and validation of an instrument that predicts student attrition. *Journal of College Student Development, 50*, 373-390.

Survey Items	Entrance Survey			Exit Survey			Paired-sample t-tests			
	n	M	SD	n	M	SD	t	df	P	ES
In general, how satisfied are you with the quality of instruction you are receiving here?	15	4.40	0.63	15	4.33	0.90	0.24	14	0.818	0.90
<b>Advising Effectiveness</b>										
How satisfied are you with the academic advising you receive here?	15	4.40	0.63	15	4.27	0.96	0.49	14	0.634	0.16
How easy is it to get answers to your questions about things related to your education and training here?	15	4.33	0.90	15	4.33	1.11	0.00	14	1.000	0.00
How would you rate the academic advisement you receive here?	15	4.40	0.63	15	4.40	0.74	0.00	14	1.000	1.19
<b>Financial Strain</b>										
How often do you worry about having enough money to meet your needs?	15	3.47	1.30	15	3.93	1.10	-1.71	14	0.110	-0.38
How difficult is it for you or your family to be able to handle college costs?	15	3.47	0.83	15	3.60	0.99	-0.70	14	0.499	-0.14
When considering the financial costs of being in college, how often do you feel unable to do things that other students here can afford to do?	14	3.86	0.95	14	4.00	1.10	-0.69	13	0.500	-0.14
How much of a financial strain is it for you to purchase the essential resources you need for courses such as books and supplies?	15	3.67	0.98	15	3.27	1.49	1.38	14	0.189	0.32
<b>Grit</b>										
When you experience setbacks on tasks that are important to you, how likely are you to complete those tasks?	15	4.07	1.03	15	4.07	1.03	0.00	14	1.000	0.00
How likely are you to finish whatever you begin?	14	4.50	0.65	14	4.43	0.85	0.322	13	0.752	0.09
How typical is it for you to be very interested in an activity and then lose interest a short time later?	15	3.67	0.82	15	3.27	1.03	1.871	14	0.082	0.43
How likely are you to keep working on projects or tasks that require more than a few months to complete?	15	3.73	0.88	15	3.53	1.25	0.716	14	0.486	0.19

Note. The CPQ items used a five-point scale. A high mean score indicates better outcomes. Effect size (ES) estimating of the magnitude of differences over time is reported using the Cohen's d statistic (Ferguson, 2009; Lipsey et al., 2012).

\*p ≤ .05, \*\* p ≤ .01, \*\*\* p ≤ .001

## Cross-Cohort Comparison of Exit Survey Responses

### Persistence and Retention

Table 7 shows the comparison between Cohorts 1 and 2 in relation to their perceptions of persistence and retention related constructs on the exit survey. Overall, **Cohort 2 respondents had significantly higher ratings of career integration** ( $t(24) = -3.51, p=0.002, ES=-1.35$ ), **academic integration** ( $t(18) = -3.47, p=0.003, ES=-1.37$ ), **advising effectiveness** ( $t(25) = -2.26, p=0.032, ES=-0.87$ ), and **financial strain** ( $t(22) = -2.66, p=0.014, ES=0.59$ ).

**Table 7. Comparison of Cohort 1 and 2 Perceptions of Persistence and Retention Related Constructs**

Constructs	Cohort 1			Cohort 2			Independent sample t-tests			
	n	M	SD	n	M	SD	t	df	p	ES
Academic Efficacy	12	3.75	0.84	15	4.24	0.79	-1.57	25	0.129	-0.60
Career Integration	12	3.31	0.81	14	4.24	0.54	-3.51	24	0.002**	-1.35
Academic Integration	12	2.75	1.20	15	4.13	0.76	-3.47	18	0.003**	-1.37
Advising Effectiveness	12	3.47	1.07	15	4.33	0.91	-2.26	25	0.032*	-0.87
Financial Strain	10	2.63	1.01	14	3.75	1.03	-2.66	22	0.014*	0.59
Grit	12	4.15	0.70	15	3.82	0.79	1.131	25	0.269	0.44

Note. The CPQ items used a five-point scale. A high mean score indicates better outcomes. Effect size (ES) estimating of the magnitude of differences over time is reported using the Cohen's d statistic (Ferguson, 2009; Lipsey et al., 2012).

\* $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$

A breakdown of the Cohorts 1 and 2 comparison by item is shown in Table 8. Three of the six **career integration** items resulted in statistical significance when comparing the Cohort 1 ratings to those of Cohort 2. Specifically, **Cohort 2 had more positive perceptions of the likelihood that the training will help them receive the job they want** ( $t(16) = -3.06, p=0.007, ES=-1.21$ ), **their confidence in career training providing the necessary skills and knowledge** ( $t(25) = -4.40, p < 0.001, ES = -1.67$ ), and **their understanding of the duties and responsibilities in the career and field for which they received training** ( $t(25) = -3.00, p=0.006, ES = -1.13$ ).

Cohort 2 also had significantly higher ratings of all three **academic integration** items than ratings assigned by Cohort 1 respondents. Respondents from **Cohort 2, compared to those in Cohort 1, had more positive perceptions of the instructional quality** ( $t(25) = -2.25, p=0.034, ES = -0.87$ ) and **are more satisfied with the instruction they received** ( $t(18) = -3.97, p=0.001, ES = -1.57$ ). Additionally, **Cohort 2 indicated that instructors and courses gave them confidence in their ability to complete work successfully, which was also significantly higher than the perceptions of Cohort 1** ( $t(25) = -2.93, p=0.007, ES = -1.10$ ).

**Advising effectiveness and financial strain** were also rated higher among Cohort 2 respondents compared to Cohort 1 respondents. **Cohort 2 rated their satisfaction with the academic advising**

( $t(25)=-2.08, p=0.048, ES=-0.79$ ) and the **quality of academic advisement** ( $t(25)=-3.12, p=0.004, ES=-1.19$ ) **higher than Cohort 1**. Additionally, **Cohort 2 experienced less financial strain than Cohort 1**. They worry less about having enough money to meet their needs ( $t(23)=-2.89, p=0.008, ES=-1.17$ ), feel more capable of financially support themselves in doing things that others can afford to do ( $t(22)=-2.98, p=0.007, ES=-1.23$ ), and believe they can more easily handle the cost of college ( $t(23)=-3.01, p=0.006, ES=-1.21$ ) than Cohort 1 respondents.

**Table 8. Comparison of Cohort 1 and 2 Constructs Associated with Retention<sup>4</sup>**

Survey Items	Cohort 1			Cohort 2			Independent sample t-tests			
	n	M	SD	n	M	SD	t	df	p	ES
<b>Academic Efficacy</b>										
How confident are you that you can get the grades you want?	12	3.58	1.38	15	4.13	1.13	-1.14	25	0.264	-0.44
When you are waiting for a submitted assignment to be graded, how assured do you feel that the work you have done is acceptable?	12	3.92	0.90	15	4.20	1.01	-0.76	25	0.456	-0.29
How much doubt do you have about being able to make the grades you want?	12	3.75	1.06	15	4.40	0.63	-1.88	17	0.077	-0.75
<b>Career Integration</b>										
How likely is it that the training you are receiving here will help you to get the job you want?	12	2.92	1.51	15	4.40	0.83	-3.06	16	0.007**	-1.21
How confident are you that the career training you receive here will give you the necessary knowledge and skills?	12	2.92	1.08	15	4.47	0.74	-4.40	25	0.000**	-1.67
How much of what you are learning at this school do you think is irrelevant?	12	2.83	0.58	14	3.50	1.16	-1.89	20	0.073	-0.73
How much do you know about the duties and responsibilities of the career and field in which you are receiving training?	12	3.00	1.21	15	4.13	0.74	-3.00	25	0.006**	-1.13
How committed are you to getting a job in the field for which you are training?	12	3.83	1.38	15	4.47	1.25	-1.27	25	0.216	-0.49
How important is it for you to think of your career as a key part of your identity?	12	4.33	0.78	15	4.47	0.92	-0.40	25	0.692	-0.16

<sup>4</sup> Adapted from Davidson, W. B., Beck, H., & Milligan, M. (2009). The College Persistence Questionnaire: Development and validation of an instrument that predicts student attrition. *Journal of College Student Development, 50*, 373-390.

Survey Items	Cohort 1			Cohort 2			Independent sample t-tests			
	n	M	SD	n	M	SD	t	df	p	ES
<b>Academic Integration</b>										
How would you rate the quality of the instruction you are receiving here?	12	2.67	1.07	15	3.73	1.34	-2.25	25	0.034*	-0.87
How much do the instructors and courses make you feel like you can do the work successfully?	12	3.08	1.38	15	4.33	0.82	-2.93	25	0.007**	-1.10
In general, how satisfied are you with the quality of instruction you are receiving here?	12	2.50	1.38	15	4.33	0.90	-3.97	18	0.001**	-1.57
<b>Advising Effectiveness</b>										
How satisfied are you with the academic advising you receive here?	12	3.42	1.17	15	4.27	0.96	-2.08	25	0.048*	-0.79
How easy is it to get answers to your questions about things related to your education and training here?	12	3.58	1.44	15	4.33	1.11	-1.53	25	0.140	-0.58
How would you rate the academic advisement you receive here?	12	3.42	0.90	15	4.40	0.74	-3.12	25	0.004**	-1.19
<b>Financial Strain</b>										
How often do you worry about having enough money to meet your needs?	10	2.60	1.17	15	3.93	1.10	-2.89	23	0.008**	-1.17
How difficult is it for you or your family to be able to handle college costs?	10	2.30	1.16	15	3.60	0.99	-3.01	23	0.006**	-1.21
When considering the financial costs of being in college, how often do you feel unable to do things that other students here can afford to do?	10	2.60	1.17	14	4.00	1.11	-2.98	22	0.007**	-1.23
How much of a financial strain is it for you to purchase the essential resources you need for courses such as books and supplies?	10	3.00	1.25	15	3.27	1.49	-0.47	23	0.645	-0.20
<b>Grit</b>										
When you experience setbacks on tasks that are important to you, how likely are you to complete those tasks?	12	4.08	1.00	15	4.07	1.03	0.04	25	0.967	0.01
How likely are you to finish whatever you begin?	12	4.75	0.62	15	4.40	0.83	1.21	25	0.236	0.48
How typical is it for you to be very interested in an activity and then lose interest a short time later?	12	3.92	1.17	15	3.27	1.03	1.54	25	0.137	0.59

Survey Items	Cohort 1			Cohort 2			Independent sample t-tests			
	n	M	SD	n	M	SD	t	df	p	ES
How likely are you to keep working on projects or tasks that require more than a few months to complete?	12	3.83	0.94	15	3.53	1.25	0.69	35	0.496	0.27

Note. The CPQ items used a five-point scale. A high mean score indicates better outcomes. Effect size (ES) estimating of the magnitude of differences over time is reported using the Cohen's *d* statistic (Ferguson, 2009; Lipsey et al., 2012).

\* $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$

## Technology Experiences

Cohorts 1 and 2 were asked to rate the extent to which technology facilitated their learning experience. Respondents from Cohort 1 indicated that technology provided in the TPAT program somewhat facilitated their learning experiences ( $M=3.00$ ,  $SD=1.35$ ). Additionally, Cohort 1 reported that LRSC provided some state-of-the-art lab and training equipment in preparing them for precision agricultural careers ( $M=2.58$ ,  $SD=1.00$ ). Cohort 2 reported that the technology greatly enhanced their learning experiences ( $M=4.00$ ,  $SD=0.89$ ) and prepared them for the precision agriculture job market ( $M=3.94$ ,  $SD=0.77$ ). **Responses from Cohort 2 were significantly higher than those of Cohort 1**, as shown in Table 9.

**Table 9. Cohort 1 and 2 Perceptions of Technology**

Survey Items	Cohort 1			Cohort 2			Independent sample t-tests			
	n	M	SD	n	M	SD	t	df	P	ES
To what extent did the technology provided in the LRSC training environment facilitate your learning experience?	12	3.00	1.35	16	4.00	0.89	2.23	18	0.039*	-0.87
To what extent does LRSC provide state-of-the-art lab and training equipment that is preparing you to be competitive in the precision agriculture job market?	12	2.58	1.00	16	3.94	0.77	4.06	26	0.000***	-1.52

Note. A high mean score indicates a more positive response (responses ranged from 1 = *Not at all* to 5 = *Extensively*). Effect size (ES) estimating of the magnitude of differences over time is reported using the Cohen's *d* statistic (Ferguson, 2009; Lipsey et al., 2012).

\* $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$

## Networking Opportunities

Both cohorts were asked to reflect on their networking opportunities throughout the TPAT program (Table 10). Again, **Cohort 2 respondents reported more networking opportunities than did Cohort 1**. More specifically, Cohort 1 respondents indicated that they rarely (42%) or sometimes (33%) had opportunities to build networks with professional contacts, while Cohort 2 reported they sometimes (38%) or often (38%) received such opportunities. One half of Cohort 1 stated they had some opportunities to



network, connect, or interact with potential employers. Results show that 44% of Cohort 2 respondents often networked with potential employers, while an additional 25% of respondents had some opportunities for networking.

**Table 10. Cohort 1 and 2 Perceptions of Networking Opportunities**

Survey Items	Cohort 1		Cohort 2	
	n	%	n	%
<b>How often have you had opportunities to build a network of professional contacts (including peers, mentors, employers, and so on)?</b>				
Never	--	--	--	--
Rarely	5	41.7%	--	--
Sometimes	4	33.3%	6	37.5%
Often	2	16.7%	6	37.5%
All of the time	1	8.3%	4	25.0%
<b>How often have you had opportunities specifically to network, connect, or interact with potential employers?</b>				
Never	--	--	--	--
Rarely	4	33.3%	3	18.8%
Sometimes	6	50.0%	4	25.0%
Often	2	16.7%	7	43.8%
All of the time	--	--	2	12.5%

### Experiential Learning Opportunities

Cohorts 1 and 2 may have also participated in experiential learning opportunities as a part of the TPAT program. Respondents were asked to rate each opportunity based on their experiences, or they could select *not applicable* for any activities in which they did not participate. **Cohort 1 and 2 respondents both reported highest participation in paid internships, company or factory visits and job fairs.** Paid internships received the most favorable ratings, with 46% of Cohort 1 and 60% of Cohort 2 indicating the quality was excellent. Overall, Cohort 1 respondents were *neither satisfied or dissatisfied* (33%) or *somewhat satisfied* (25%) with the quality of the experiential learning opportunities, while Cohort 2 was *somewhat satisfied* (38%) or *very satisfied* (44%). Table 11 displays all ratings of each experiential learning opportunity.

**Table 11. Cohort 1 and 2 Experiential Learning Opportunities**

Survey Items/Responses	Cohort 1		Cohort 2	
	n	%	n	%
<b>During the course of your training, you may have participated in some of the following experiential learning opportunities. How would you rate the quality of the experiential learning opportunities in which you have participated? Respondents could select N/A if they did not participate in the experience.</b>				
<b>Company/Factory Visits</b>				
Very poor	1	10.0%	--	--
Poor	1	10.0%	1	7.1%
Fair	3	30.0%	2	14.3%
Good	4	40.0%	5	35.7%
Excellent	1	10.0%	6	42.9%
<b>Job shadowing</b>				
Very poor	1	20.0%	--	--
Poor	2	40.0%	--	--
Fair	--	--	2	28.6%
Good	--	--	1	14.3%
Excellent	2	40.0%	4	57.1%
<b>Paid Internship</b>				
Very poor	1	9.1%	--	--
Poor	2	18.2%	--	--
Fair	1	9.1%	1	6.7%
Good	2	18.2%	5	33.3%
Excellent	5	45.5%	9	60.0%
<b>Unpaid Internship</b>				
Very poor	--	--	--	--
Poor	1	50.0%	--	--
Fair	1	50.0%	2	50.0%
Good	--	--	1	25.0%
Excellent	--	--	1	25.0%
<b>Job Fairs</b>				
Very poor	--	--	--	--
Poor	2	33.3%	1	7.1%
Fair	1	16.7%	2	14.3%
Good	3	50.0%	5	35.7%
Excellent	--	--	6	42.9%

Survey Items/Responses	Cohort 1		Cohort 2	
	n	%	n	%
<b>Overall, how satisfied are you with the quality of the experiential learning opportunities in which you participated?</b>				
Very dissatisfied	1	8.3%	--	--
Somewhat dissatisfied	2	16.7%	1	6.3%
Neither satisfied or dissatisfied	4	33.3%	2	12.5%
Somewhat satisfied	3	25.0%	6	37.5%
Very satisfied	2	16.7%	7	43.8%

Note. Percentages based on the total number of respondents reporting participation in an experiential learning opportunities. N/A responses were excluded from the analysis.

## Advising and Coaching

All Cohort 1 respondents (100%) and the majority of Cohort 2 respondents (88%) met with an advisor or coach during their enrollment in the TPAT program, as shown in Table 12. The top reason for respondents to visit their advisor was to plan for their courses (100%, Cohort 1; 93%, Cohort 2). Cohort 1 respondents also visited their advisor to discuss their academic performance (50%), whereas Cohort 2 respondents discussed finding an internship or other experiential learning opportunity (64%).

**Table 12. Cohort 1 and 2 Experiences with Advising/Coaching Services**

Survey Items	Cohort 1		Cohort 2	
	n	%	n	%
<b>Have you met with an advisor or coach since enrollment?</b>				
I know nothing about advising or coaching services.	--	--	--	--
I have not met with an advisor/coach	--	--	2	12.5%
I have met with an advisor/coach.	12	100%	14	87.5%
<b>If you have met with an advisor/coach, please indicate the major reasons for the meeting(s). (Select all that apply)</b>				
To plan for my courses	12	100%	13	92.9%
To review my placement test results	2	16.7%	3	21.4%
To review or discuss my prior learning assessment and/or credit for prior learning	3	25.0%	4	28.6%
To create or revise an individualized action plan	2	16.7%	3	21.4%
To discuss my academic performance	6	50.0%	6	42.8%
To discuss career options	4	33.3%	7	50.0%
To find an internship or other experiential learning opportunity	3	25.0%	9	64.3%

Cohort 1 and 2 respondents also rated their perceptions of the advising and coaching services by indicating the extent to which they agree or disagree with eight statements (Table 13). The majority of Cohort 1 respondents agreed or strongly agreed that their advisor was knowledgeable about his or her profession (92%) and understood their career interests and goals (67%). They also felt comfortable going to

their advisors for school-related problems (83% *agreed* or *strongly agreed*) and they were sensitive to students' personal needs (67% *agreed* or *strongly agreed*).

Cohort 2 respondents agreed or strongly agreed that their advisors were knowledgeable (86%), they understood their career interests and goals (86%), and were sensitive to their personal needs and problems (83%). Cohort 2 also tended to *agree* or *strongly agree* that they felt comfortable going to their advisor with school-related or personal problems that affect their academic performance (79% and 75%, respectively). Additionally, they believed that their advisor provided information and resources to support their learning needs and career goals (79% *agreed* or *strongly agreed*).

Respondents then rated the quality of and satisfaction with the advising services they received. Half of the Cohort 1 and Cohort 2 respondents (67% and 86%, respectively) rated the quality of advising services as *good* or *excellent*. Cohort 1 tended to be *somewhat* or *very satisfied* (58%) with the services offered, while Cohort 2 were *satisfied* or *very satisfied* (86%). The majority of Cohort 1 and Cohort 2 participants satisfied with the services they received; therefore, they did not have any recommendations for what they would like to see done differently in terms of advising (58% and 86%, respectively).

**Table 13. Cohort 1 and 2 Perceptions of Advising/Coaching Services**

Survey Items/Responses	Cohort 1		Cohort 2	
	n	%	n	%
<b>Please indicate the extent to which you agree or disagree with the following statements about the advising and coaching services you received.</b>				
<b>My advisor/coach was knowledgeable about his/her profession.</b>	<b>12</b>		<b>14</b>	
Strongly disagree	--	--	--	--
Disagree	--	--	--	--
Neither agree or disagree	1	8.3%	2	14.3%
Agree	8	66.7%	3	21.4%
Strongly agree	3	25.0%	9	64.3%
N/A	--	--	--	--
<b>My advisor/coach was sensitive to my personal needs and problems</b>	<b>12</b>		<b>12</b>	
Strongly disagree	--	--	1	8.3%
Disagree	2	16.7%	--	--
Neither agree or disagree	1	8.3%	1	8.3%
Agree	5	41.7%	5	41.7%
Strongly agree	3	25.0%	5	41.7%
N/A	1	8.3%	--	--

Survey Items/Responses	Cohort 1		Cohort 2	
	n	%	n	%
<b>My advisor/coach understood my career interests and goals.</b>	<b>12</b>		<b>14</b>	
Strongly disagree	--	--	1	7.1%
Disagree	--	--	--	--
Neither agree or disagree	4	33.3%	1	7.1%
Agree	6	50.0%	6	42.9%
Strongly agree	2	16.7%	6	42.9%
N/A	--	--	--	--
<b>I felt comfortable going to my advisor/coach when I have school-related problems.</b>	<b>12</b>		<b>14</b>	
Strongly disagree	--	--	--	--
Disagree	--	--	1	7.1%
Neither agree or disagree	2	16.7%	2	14.3%
Agree	7	58.3%	5	35.7%
Strongly agree	3	25.0%	6	42.9%
N/A	--	--	--	--
<b>I felt comfortable going to my advisor/coach when I had personal issues that affected my academic performance.</b>	<b>12</b>		<b>12</b>	
Strongly disagree	--	--	--	--
Disagree	--	--	1	8.3%
Neither agree or disagree	3	25.0%	2	16.7%
Agree	3	25.0%	4	33.3%
Strongly agree	2	16.7%	5	41.7%
N/A	4	33.3%	--	--
<b>My advisor/coach provided information and resources I needed to support my learning needs and career goals.</b>	<b>12</b>		<b>14</b>	
Strongly disagree	--	--	--	--
Disagree	--	--	1	7.1%
Neither agree or disagree	3	25.0%	2	14.3%
Agree	5	41.7%	6	42.9%
Strongly agree	2	16.7%	5	35.7%
N/A	2	16.7%	--	--

Survey Items/Responses	Cohort 1		Cohort 2	
	n	%	n	%
<b>My advisor/coach worked with my faculty advisor to make sure my learning needs were met.</b>	<b>12</b>		<b>14</b>	
Strongly disagree	--	--	--	--
Disagree	1	8.3%	1	7.1%
Neither agree or disagree	3	25.0%	2	14.3%
Agree	4	33.3%	6	42.9%
Strongly agree	2	16.7%	5	35.7%
N/A	2	16.7%	--	--
<b>My advisor/coach helped me stay on track to complete my program.</b>	<b>12</b>		<b>14</b>	
Strongly disagree	--	--	1	7.1%
Disagree	--	--	--	--
Neither agree or disagree	3	25.0%	2	14.3%
Agree	4	33.3%	5	35.7%
Strongly agree	3	25.0%	6	42.9%
N/A	2	16.7%	--	--
<b>Overall, how would you rate the quality of the advising and coaching services you received?</b>				
Very poor	--	--	--	--
Poor	--	--	1	7.1%
Fair	4	33.3%	1	7.1%
Good	6	50.0%	7	50.0%
Excellent	2	16.7%	5	35.7%
<b>Overall, how satisfied are you with the frequency of the advising and coaching services you received?</b>				
Very dissatisfied	--	--	--	--
Somewhat dissatisfied	1	8.3%	1	7.1%
Neither satisfied or dissatisfied	4	33.3%	1	7.1%
Somewhat satisfied	6	50.0%	4	28.6%
Very satisfied	1	8.3%	8	57.1%
<b>What would you like to see differently in terms of advising and coaching services offered for students like you? Select all that apply and describe if needed.</b>				
I wish my advisor/coach would have reached out to me more often.	1	8.3%	1	7.1%
I wish I would have reached out to my advisor/coach more often.	2	16.7%	1	7.1%
None of the above (i.e., I am satisfied with the amount of services I have received from my advisor/coach.)	7	58.3%	12	85.7%

Survey Items/Responses	Cohort 1		Cohort 2	
	n	%	n	%
Other:				
<ul style="list-style-type: none"> <li>• Need more help or confidence in finding work.</li> <li>• I wish my advisor was more available instead of attending agriculture shows.</li> </ul>	2	16.7%	--	--

## Quality and Satisfaction

Table 14 displays Cohort 1 and Cohort 2 respondents' overall satisfaction. Overall, Cohort 1 provided neutral responses to explain their satisfaction with the TPAT program, with a quality rating between *poor* and *fair* ( $M=2.58$ ,  $SD=1.17$ ). **Cohort 2 respondents' mean rating of 4.13 ( $SD=1.15$ ) for the quality of the TPAT program was significantly higher than Cohort 1 ( $t(26)=-3.50$ ,  $p=0.002$ ,  $ES=-1.34$ ).**

Additionally, Cohort 1 reported that they were *neither satisfied or dissatisfied* with the TPAT program ( $M=2.67$ ,  $SD=1.30$ ) and *neither likely or unlikely* to recommend the program to other prospective students ( $M=2.75$ ,  $SD=1.22$ ). Cohort 2, however, indicated they were *somewhat satisfied* ( $M=4.13$ ,  $SD=1.15$ ) and they were *likely* to recommend the program ( $M=4.00$ ,  $SD=1.10$ ). **The differences between Cohort 1 and Cohort 2 respondents' ratings of satisfaction and their likelihood to recommend the program were statistically significant ( $t(26)=-3.14$ ,  $p=0.004$ ,  $ES=-1.19$  and  $t(26)=-2.85$ ,  $p=0.008$ ,  $ES=-1.08$ ; respectively).**

**Table 14. Cohort 1 and 2 Overall Satisfaction**

Survey Items	Cohort 1			Cohort 2			Independent sample t-tests			
	n	M	SD	n	M	SD	t	df	P	ES
Overall, how would you rate the quality of the TPAT program at LRSC?	12	2.58	1.17	16	4.13	1.15	-3.50	26	0.002**	-1.34
Overall, how satisfied are you with the TPAT program at LRSC?	12	2.67	1.30	16	4.13	1.15	-3.14	26	0.004**	-1.19
How likely are you to recommend the TPAT program to friends or other prospective students?	12	2.75	1.22	16	4.00	1.10	-2.85	26	0.008**	-1.08

Note. These three items used a five-point scale. A high mean score indicates a more positive response. Effect size (ES) estimating of the magnitude of differences over time is reported using the Cohen's *d* statistic (Ferguson, 2009; Lipsey et al., 2012).

\* $p \leq .05$ , \*\*  $p \leq .01$ , \*\*\*  $p \leq .001$

## Conclusions

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Overall, students enrolled in the TPAT program at LRSC tended to have consistent perceptions of persistence and retention related constructs from the beginning of the program to the end. Cohort 1, on average, assigned neutral to somewhat positive ratings for each category, with financial strain yielding the least favorable rating. By the end of the program, Cohort 1 rated career integration significantly lower than previously rated at the beginning of the program. These findings may be consistent with a sense of unpreparedness for the workforce as they complete their training program and pursue careers in their field. Primarily, students indicated that they no longer felt confident that their training they received would help them get the job they want.

Students from Cohort 2 reported positive perceptions toward the majority of retention related constructs. They experienced some financial strain, which was contributed to worrying about having enough money to meet their needs or their ability to handle college costs. However, Cohort 2 exuded confidence that they could complete coursework successfully to receive not only the necessary skills and knowledge but to also earn the grades they desire. They also believed the training program would prepare them for the jobs they want.

Findings revealed that Cohort 2 reported more positive ratings of all retention constructs (i.e., academic efficacy, career integration, academic integration, advising effectiveness, financial strain and grit) than those of Cohort 1. Ratings were significantly higher for career integration, academic integration, advising effectiveness, and financial strain. Additionally, students' perceptions of technology were more favorable among Cohort 2 respondents than Cohort 1 respondents. The differences between the cohorts' ratings regarding the use of state-of-the-art labs and equipment and the use of technology to facilitate their learning experience yielded statistical significance.

The aforementioned trends continued into students' perceptions of experiential learning opportunities, networking opportunities, and advising experiences as Cohort 2 reported more favorable results than Cohort 1 respondents. Specifically, Cohort 2 identified more opportunities to network with professionals and potential employers, and their perceptions about the quality of experiential learning opportunities were higher. Students in Cohort 2 were also more satisfied than Cohort 1 when reflecting on the opportunities for experiential learning as well as the quality and frequency of services received from advisors.

In general, the results indicate that adjustments and refinements made by program staff may have improved students' perceptions of and experiences in the TPAT program. What is also important in the interpretation of the findings is that Cohort 1 students differed in a number of characteristics that may have contributed to the variances in responses between Cohort 1 and 2. Cohort 1 had a higher number of nontraditional students who had prior work experiences (although not in the agricultural field) and required a number of supports and resources available through LRSC that facilitated their successful completion of the TPAT program. These extraneous variables may account for some variance in the differences between the two groups. Comparisons between



Cohorts 1 and 2 should be made with caution. However, program staff can use the findings from this report as they continue to make program improvements to ensure training and support meets the needs of students in achieving academic and professional success.

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# Appendix A: Summary of Findings from Year 3 Implementation Evaluation

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TAACCCT grantees were permitted to use grant funds for implementing their projects through the third year of the project (i.e., for Round 2 grantees Year 3 was October 1, 2014 to September 30, 2015). The following is a summary of key evaluation findings from McREL's final examination of the TPAT project's implementation. The reader is referred to the Year 3 annual evaluation report for more detail (Good & Knotts, 2015). The summary is organized by the four overarching formative evaluation questions that guided the implementation focus of the evaluation.

## How were the key strategies and activities of the TPAT project implemented?

The key findings of the TPAT project's progress to date are highlighted as follows.

### Development of Comprehensive Precision Agriculture Curricula:

- Curricula have been implemented as planned with minor adjustments to meet students' needs. Faculty members assess the interests and background knowledge of their students to tailor the content to their needs in order for them to successfully complete the program and succeed in the workforce. Student feedback following their internships and other experiential learning opportunities also contribute to ensuring that a comprehensive curriculum is being offered that focuses on the specific content and skills required of students completing the program.
- Technology plays a major role in contextualizing content in the TPAT project. Faculty members provide exposure to various technologies and equipment utilized in precision agriculture to prepare students for the tasks required in their future careers.

### Development of Comprehensive Student Support Services:

- The cognitive tutoring coach funded by the TAACCCT grant has been identified as a major proponent of success in supporting the TPAT students. Faculty, project leaders, and students alike voiced that this staff member supplied tutoring and academic advising while tracking students' progress and communicating with faculty about student needs. Faculty and partners are also credited for providing students with support services (e.g., career guidance).
- The TRIO-SSS has and will continue to be available to students seeking academic support once the TAACCCT funding ceases. Faculty indicated that the services support students with tutoring, advising, and career guidance.

## Development of Online and Technology-Enabled Learning:

- The curriculum design coordinator has worked with faculty members to create online modules for their web-based courses. The modules include electronic notes, recorded lectures, presentation slides, and simulation labs.
- Many courses have online components, whether offered entirely online or as a hybrid model (i.e., online and in-person). TPAT project staff shared their hope to transfer the program to being offered fully online.

## Strategic Alignment with Partners in Industry and Workforce:

- Partners have been involved in several ways including loaning equipment and technology for the TPAT program to utilize as well as providing course lectures and training to both students and faculty on agriculture equipment, software, and technology. In addition, partners have informed students of workforce needs and effective strategies in gaining employment.
- Based on findings from the project staff interviews and partner survey results, the partners have provided positive feedback regarding their involvement and the program's ability to train quality workers in agricultural fields.

## Development of a Successful Recruitment Strategy:

- TPAT leaders have actively recruited for the precision agriculture program via mediated communication (i.e., magazine articles and infomercials), conferences, expos, and word of mouth.
- The number of students in Cohorts 1 and 2 were at the project targets. However, the number of TAA-eligible and veteran students was lower than proposed. The favorable economy in North Dakota was referenced as an explanation for the less-than-desired TAA-eligible enrollment.
- Strategies to increase enrollment in specific targeted groups were implemented. For instance, project staff have contacted Job Search North Dakota in an attempt to increase TAA-eligible student enrollment. TPAT staff have also partnered with Veterans Education Training to recruit returning veterans who may want to receive training in the classroom or via online.

## To what extent were the key TPAT project strategies and activities implemented as planned?

The fidelity of implementation was measured using three dimensions cited in implementation science literature: adherence, quality, and participant responsiveness (Century et al.,

2010; Dane & Schneider, 1998; Fixsen et al., 2005; Mowbray et al., 2003). Key findings for each dimensional aspect are presented below.

**Adherence:** Adherence refers to the extent to which the critical components of an intended program are present when the program is enacted. At the start of the TPAT project, 30 deliverables were identified in the project’s work plan. The deliverables are organized around the five priority areas with a sixth area focused on start-up types of activities. More than two thirds of the deliverables are identified as ongoing while all seven of the start-up related deliverables are complete. Two deliverables have yet to be started (i.e., the written stacking plan/written latticing plan and NDUS problem report).

**Quality:** Quality measures the qualitative aspects of program delivery that are not directly related to the implementation of prescribed content. For this project, indicators of quality (i.e., technology use, instruction, and academic advising) have been measured through the Student Entrance and Exit Surveys. Cohort 2 participants gave the entrance survey items average ratings of 3.95 to 4.55 on a 5-point scale. Cohort 1 participants gave the exit survey items average ratings of 2.38 to 3.63. For both cohorts, satisfaction was highest with the academic advising items and lowest with technology use. Project partners indicated moderately high perceptions of quality of the key project components on the Partner Survey with average ratings ranging from 3.50 to 4.00 on a 5-point scale.

**Responsiveness:** Respondents’ level of satisfaction with the TPAT program serves as an indicator for whether the project has been responsive to participants. On average, Cohort 2 students rated their level of satisfaction as 4.19 on a 5-point scale; whereas Cohort 1 students rated their level of satisfaction as 2.63. Their likelihood of recommending the program to friends or other prospective students received an average rating of 4.19 on a 5-point scale for Cohort 2 students and 2.63 for Cohort 1 students. Partners said they would *likely* or *very likely* recommend the program to others with whom they collaborate (average rating of 4.30 on a 5-point scale). Generally, TPAT partners rated their level of current engagement in the key project components and activities relatively low, with average ratings of 1.29 to 2.71 on a 5-point scale. However, they did report satisfaction with TPAT staff members’ efforts to engage them in the project (3.71 on a 5-point scale).

## **What changes were made to the programs of study during implementation and for what reasons?**

Based on the project record review and interviews with TPAT project staff, the biggest changes occurred during the project planning year and only minor adjustments have occurred to the program’s implementation since then. In Year 1, there was a reevaluation and redesign of the program curricula from the originally proposed “mastery” learning blocks or modules to structuring the program into a two-year AAS degree. This change was made after prompting from the advisory committee. Adjustments that have been made during program implementation (i.e., Years 2 and 3) were made to better address student needs. During the first program implementation year,

challenges occurred with ensuring that the content met students' needs in regard to relevant and comprehensive knowledge required for career application. Additionally, student feedback after their internships was used to better understand which content and practical skills should be incorporated more heavily into the curricula. Students' experiences and perceptions of their preparedness for the internships and their careers offered faculty insight into the areas in which they expressed that they needed more instruction.

## **To what extent is the TPAT program sustainable and transferable?**

Given the workforce demand for precision agricultural technicians, TPAT project staff and partners indicated that the program will be sustainable. However, sustaining a program requires resources and necessitates continued collaboration with partners as well as identifying and securing financial supports. Industry partners have supplied support with equipment and technology, curriculum design, and instruction throughout the program. Graduates of the precision agriculture program are equipped with the knowledge and skills to enter the workforce. Additionally, LRSC has provided both non-credit and credit-bearing continuing education courses to local producers as part of the TPAT project. However, the main challenge identified in the sustainability plan is the loss of the DOL funding once the grant period ends. TPAT project leaders and staff have actively sought new financial support (i.e., grants and endowments) to aid future implementation. With the cessation of grant funds in September 2015, TPAT project leaders are seeking alternative methods for filling positions currently funded by the grant. Although TPAT project leaders acknowledge that the program is expensive, they note that it is bringing in revenue online as well as through student enrollment (e.g., tuition, room and board, and financial aid).

An articulation agreement with North Dakota State University has been established for transferring credits that a student earns as part of the TPAT program to a program at the university. In the proposal (LRSC, 2012), it was predicted that students intending to continue their education would most likely transfer into agriculture and biosystems engineering programs at the College of Agriculture at North Dakota State University. However, faculty and staff realized that students are often transferring into agronomy and crop science majors instead. Therefore, LRSC aims to form articulation agreements with those departments in the future to meet students' educational goals.

## Appendix B: TPAT Participant Outcomes

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As shown in Table B1, the TPAT program served 130 unique participants. This exceeded the target of 120 that was indicated in the grant proposal. Collectively the TPAT participants completed 2,616 credits.

**Table B1. TPAT Participant Outcomes Table 15. TPAT Participant Outcomes**

Outcome Indicators		Year 1	Year 2	Year 3	Year 4	Cumulative
O1	Unique Participants Served/Enrollees	23	62	42	3	130
O2	Total Number Who Have Completed a Grant-Funded Program of Study	0	0	12	3	15
O2.a	Total Number of Incumbent Workers Who Have Completed a Grant-Funded Program	0	0	3	0	3
O3	Total Number Still Retained in Their Program of Study or Other Grant-Funded Program(s)	23	41	19	34	-- <sup>1</sup>
O4	Total Number Retained in Other Education Program(s)	0	2	1	0	3
O5	Total Number of Credit Hours Completed	0	861	1286	469	2,616
O5.a	Total Number of Students Completing Credit Hours	23	61	38	31	153
O6	Total Number of Earned Degrees/Certificates	0	0	36	2	-- <sup>1</sup>
O6.a	Total Number of Students Earning Certificates (less than one year)	0	26	17	15	58
O6.b	Total Number of Students Earning Certificates (more than one year)	0	0	0	0	0
O6.c	Total Number of Students Earning Degrees	0	0	12	3	15
O7	Total Number Enrolled in Further Education After Program of Study Completion	0	0	4	1	5
O8	Total Number Employed After Program of Study Completion	0	0	5	2	7
O9	Total Number Retained in Employment After Program of Study Completion	0	0	0	2	2
O10	Total Number of Those Employed at Enrollment Who Receive a Wage Increase Post-Enrollment <sup>2</sup>	0	0	0	12	12

<sup>1</sup>The year to year values are not mutually exclusive. Therefore, adding the yearly totals would not be an accurate count of the total number of participants retained across all years of the TAACCCT program.

<sup>2</sup>For participants who were employed on the family farm at the time they were enrolled in a TPAT program of study and continued their employment there, it is difficult to determine wage increases as often times these individuals don't receive a paycheck.



## Appendix C: Student Exit Survey

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## Training for Precision Agriculture Technicians (TPAT) Student Exit Survey

### Informed Consent

### *Lake Region State College (LRSC) Training for Precision Agriculture Technicians (TPAT)*

### *Student Exit Survey*

Your college has been awarded a Trade Adjustment Assistance Community College and Career Training (TAACCCT) grant from the U.S. Department of Labor to offer new certificate, diploma, and associate degree programs in the field of precision agriculture. The goal of the grant is to help prepare participants like you for employment in high-wage, high-skill occupations.

**Purpose of the Survey:** To determine the grant's success, McREL International is working with your college to gather information from all students who are enrolled in the grant programs. Because you have completed one of these programs, we would like you to participate in this survey. The survey includes questions about your perceptions of and experiences with the program, including your experiences with student support services. This survey will take you about 10 to 15 minutes to finish.

**Protecting Your Rights:** Participation in this survey is voluntary and should not involve any known risks above those normally encountered in daily life. There are no "right" or "wrong" answers for this survey. We just want to hear about your experiences and thoughts. If you decide that you do not want to finish taking the survey, you can stop at any time—even if you have already started. However, your experiences and feedback are important; the college will be using this kind of information from students to help improve the quality and relevance of the program for future students.

**Benefits:** While there are no direct benefits or compensation to individuals for participating, the survey is one of several data sources that will be used to evaluate the development and implementation of the program. The evaluation report will provide crucial information to project staff to help them understand the impact of the program on participants and partners. Further, the study can contribute to the larger collection of research literature about the impact of similar workforce training initiatives.

**Questions:** We appreciate your time and help in making sure the college can provide a program that suits students' needs and career goals. If you have any questions about this survey, please contact Kim Good, Managing Evaluator (800.624.9120, ext. 5449; [kgood@mcrel.org](mailto:kgood@mcrel.org)). For information on protection of your rights as a participant, you may contact Karen Bumgardner (800.624.9120, ext. 5841; [kbumgardner@mcrel.org](mailto:kbumgardner@mcrel.org)).

### Electronic Consent

**If you agree to participate in this survey, please click "Yes, I agree to participate in the survey" below. By doing so, you are indicating that you have read the information on this page, are at least 18 years of age, and that you voluntarily agree to participate in the survey.**

**If you decline to participate in the survey, click "No, I do not agree to participate in the survey" below.**

- Yes, I agree to participate in the survey.
- No, I do not agree to participate in the survey.

Next



## Training for Precision Agriculture Technicians (TPAT) Student Exit Survey

### General Information

1. What is your student ID number?

2. What is your name?

Last Name:

First Name:

Middle Initial:

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## Training for Precision Agriculture Technicians (TPAT) Student Exit Survey

### Perceptions, Expectations, and Experiences

In this section, we would like to learn more about your perceptions, expectations, and experiences. These questions<sup>1</sup> will help the college understand how to improve its programs to fit your needs and better support your educational and career goals.

Please select the answer that best represents your response to each item. Select N/A if the item does not apply to your situation or you do not have experience with that particular item.

**3.a. How confident are you that you can get the grades you want?**

Very confident	Somewhat confident	Neutral	Somewhat unconfident	Very unconfident	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.b. When you are waiting for a submitted assignment to be graded, how assured do you feel that the work you have done is acceptable?**

Very assured	Somewhat assured	Neutral	Somewhat unassured	Very unassured	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.c. How much doubt do you have about being able to make the grades that you want?**

Very much doubt	Much doubt	Some doubt	Little doubt	Very little doubt	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.d. How likely is it that the training you are receiving here will help you to get the job you want?**

Very likely	Somewhat likely	Neutral	Somewhat unlikely	Very unlikely	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.e. How confident are you that the career training you receive here will give you the necessary knowledge and skills?**

Very confident	Somewhat confident	Neutral	Somewhat unconfident	Very unconfident	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

<sup>1</sup> Adapted from Davidson, W. B., Beck, H., & Milligan, M. (2009). The College Persistence Questionnaire: Development and validation of an instrument that predicts student attrition. *Journal of College Student Development, 50*, 373-390.

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## Training for Precision Agriculture Technicians (TPAT) Student Exit Survey

### Perceptions, Expectations, and Experiences

**3.f. How much of what you are learning at this school do you think is irrelevant?**

Very much	Much	Some	Little	Very little	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.g. How much do you know about the duties and responsibilities of the career and field in which you are receiving training?**

Very much	Much	Some	Little	Very little	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.h. How committed are you to getting a job in the field for which you are training?**

Very committed	Somewhat committed	Neutral	Somewhat uncommitted	Very uncommitted	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.i. How important is it for you to think of your career as a key part of your identity?**

Very important	Somewhat important	Neutral	Somewhat unimportant	Very unimportant	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.j. How would you rate the quality of the instruction you are receiving here?**

Excellent	Good	Fair	Poor	Very poor	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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## Training for Precision Agriculture Technicians (TPAT) Student Exit Survey

### Perceptions, Expectations, and Experiences

**3.k. How much do the instructors and the courses make you feel like you can do the work successfully?**

Very much	Much	Some	Little	Very little	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.l. In general, how satisfied are you with the quality of instruction you are receiving here?**

Very satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Very dissatisfied	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.m. How satisfied are you with the academic advising you receive here?**

Very satisfied	Somewhat satisfied	Neutral	Somewhat dissatisfied	Very dissatisfied	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.n. How easy is it to get answers to your questions about things related to your education and training here?**

Very easy	Somewhat easy	Neutral	Somewhat hard	Very hard	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.o. How would you rate the academic advisement you receive here?**

Excellent	Good	Fair	Poor	Very poor	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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## Training for Precision Agriculture Technicians (TPAT) Student Exit Survey

### Perceptions, Expectations, and Experiences

**3.p. How often do you worry about having enough money to meet your needs?**

Very often	Somewhat often	Sometimes	Rarely	Very rarely	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.q. How difficult is it for you or your family to be able to handle college costs?**

Very difficult	Somewhat difficult	Neutral	Somewhat easy	Very easy	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.r. When considering the financial costs of being in college, how often do you feel unable to do things that other students here can afford to do?**

Very often	Somewhat often	Sometimes	Rarely	Very rarely	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.s. How much of a financial strain is it for you to purchase the essential resources you need for courses such as books and supplies?**

Very large strain	Somewhat of a strain	Neutral	A little strain	Hardly any strain at all	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.t. When you experience setbacks on tasks that are important to you, how likely are you to complete those tasks?**

Very likely	Somewhat likely	Neutral	Somewhat unlikely	Very unlikely	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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## Training for Precision Agriculture Technicians (TPAT) Student Exit Survey

### Perceptions, Expectations, and Experiences

**3.u. How likely are you to finish whatever you begin?**

Very likely	Somewhat likely	Neutral	Somewhat unlikely	Very unlikely	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.v. How typical is it for you to be very interested in an activity and then lose interest a short time later?**

Very typical	Somewhat typical	Neutral	Somewhat unlikely	Very unlikely	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**3.w. How likely are you to keep working on projects or tasks that require more than a few months to complete?**

Very likely	Somewhat likely	Neutral	Somewhat unlikely	Very unlikely	N/A
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**4. To what extent did the technology provided in the LRSC training environment facilitate your learning experience?**

Not at all	Very little	Somewhat	Greatly	Extensively
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**5. To what extent did LRSC provide state-of-the-art lab and training equipment that prepared you to be competitive in the precision agriculture job market?**

Not at all	Very little	Somewhat	Greatly	Extensively
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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## Training for Precision Agriculture Technicians (TPAT) Student Exit Survey

### Perceptions, Expectations, and Experiences

6. How often were you provided with opportunities to build a network of professional contacts (including peers, mentors, employers, and so on)?

Never  Rarely  Sometimes  Often  All of the time

7. How often were you provided with opportunities specifically to network, connect, or interact with potential employers?

Never  Rarely  Sometimes  Often  All of the time

8. During the course of your training, you may have participated in some of the following experiential learning opportunities. How would you rate the quality of the experiential learning opportunities in which you have participated? Select N/A if you did not participate in the experience.

	Very poor	Poor	Fair	Good	Excellent	N/A
Company/factory visits	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Job shadowing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Paid internships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Unpaid internships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Job fairs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Overall, how satisfied are you with the quality of the experiential learning opportunities in which you participated?

Very dissatisfied  Somewhat dissatisfied  Neither satisfied or dissatisfied  Somewhat satisfied  Very satisfied

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## Training for Precision Agriculture Technicians (TPAT) Student Exit Survey

### Experience with Advising and Coaching Services

To support student success in academic learning, your college provides advising or coaching to support your individual learning needs. We would like to learn more about interactions and experiences with your advisor/coach since enrollment.

**10. Have you met with an advisor or coach since enrollment?**

- I know nothing about advising or coaching services.
- I have not met with an advisor/coach yet.
- I have met with an advisor/coach.

**10.a. If you have met with an advisor/coach, please indicate the major reasons for the meeting(s). (Select all that apply)**

- To plan for my courses
- To review my placement test results
- To review or discuss my prior learning assessment and/or credit for prior learning
- To create or revise an individualized action plan
- To discuss my academic performance
- To discuss career options
- To find an internship or other experiential learning opportunity

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## Training for Precision Agriculture Technicians (TPAT) Student Exit Survey

### Experience with Advising and Coaching Services

11. Please indicate the extent to which you agree or disagree with the following statements about the advising and coaching services you received.

	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree	N/A
a. My advisor/coach was knowledgeable about his/her profession.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. My advisor/coach was sensitive to my personal problems and needs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. My advisor/coach understood my career interests and goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. I felt comfortable going to my advisor/coach when I had school-related problems.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. I felt comfortable going to my advisor/coach when I had personal issues that affected my academic performance.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. My advisor/coach provided information and resources I needed to support my learning needs and career goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. My advisor/coach worked with my faculty advisor to make sure my learning needs were met.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. My advisor/coach helped me stay on track to complete my program.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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## Training for Precision Agriculture Technicians (TPAT) Student Exit Survey

### Experience with Advising and Coaching Services

12. Overall, how would you rate the quality of the advising and coaching services you received?

- Very poor      Poor      Fair      Good      Excellent
- 

13. Overall, how satisfied are you with the frequency of the advising and coaching services you received?

- Very dissatisfied      Somewhat dissatisfied      Neither satisfied or dissatisfied      Somewhat satisfied      Very satisfied
- 

14. What would you like to see differently in terms of advising and coaching services offered for students like you? Select all that apply and describe if needed.

- I wish my advisor/coach would have reached out to me more often.
- I wish I would have reached out to my advisor/coach more often.
- None of the above (i.e., I am satisfied with the amount of services I have received from my advisor/coach.)
- Other (please specify)

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## Training for Precision Agriculture Technicians (TPAT) Student Exit Survey

### Overall Satisfaction

15. Overall, how would you rate the quality of the TPAT program at LRSC?

- |                       |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Very poor             | Poor                  | Fair                  | Good                  | Excellent             |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

16. Overall, how satisfied are you with the TPAT program at LRSC?

- |                       |                       |                                   |                       |                       |
|-----------------------|-----------------------|-----------------------------------|-----------------------|-----------------------|
| Very dissatisfied     | Somewhat dissatisfied | Neither satisfied or dissatisfied | Somewhat satisfied    | Very satisfied        |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/>             | <input type="radio"/> | <input type="radio"/> |

17. How likely are you to recommend the TPAT program to friends or other prospective students?

- |                       |                       |                            |                       |                       |
|-----------------------|-----------------------|----------------------------|-----------------------|-----------------------|
| Very unlikely         | Unlikely              | Neither likely or unlikely | Likely                | Very likely           |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/>      | <input type="radio"/> | <input type="radio"/> |

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**Training for Precision Agriculture Technicians (TPAT)  
Student Exit Survey**

**Thank you for completing this survey!**

**We appreciate your time and assistance!**

**To submit your survey, please click on the 'Submit' button below.**

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