

**Understanding the Impact of the ATE Delta Information  
Systems and Cyber (DISC) Initiative at  
Phillips Community College**  
*~Year 1 Evaluation Activities~*

**A Report To:**



**Phillips Community College**

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## Introduction

This report presents key findings from evaluation work supporting Year 1 activities conducted for Phillips Community College's ATE program, "Arkansas Delta Information Systems and Cyber (DISC) Initiative." Through this NSF-ATE project, Phillips Community College will (1) increase the quality and capacity of technicians in the Information Systems Program that graduate with certificates and degrees ready to enter the workforce, and (2) increase the quality and capacity of the faculty that teach in the Information Systems Program. As this is the first year of program implementation, results focus on the student outcomes that best fit anticipated achievements within the first year of programming:

- ✓ Industry relevant, "hands on" curriculum is created,
- ✓ Student enrollment increased by 20%/year,
- ✓ Student retention rate increased by 5% each year,
- ✓ 12 students enrolled in Information Technology degree program,
- ✓ 9 additional students graduate with Certificate of Proficiencies,
- ✓ 9 additional students graduate with Information Systems degree,
- ✓ 80% of graduates obtain industry certifications, and
- ✓ Faculty earn three high level certifications each.

To assess progress toward these outcomes, program evaluator Dr. Megan Mullins, in partnership with the Principal Investigators, conducted the following evaluation activities<sup>1</sup>:

- ✓ Analysis of Secondary Institutional Data: Assessment of 2019-2020 academic enrollment and demographic data,
- ✓ Survey Research: Spring Student Satisfaction Survey, and
- ✓ Telephone Interviews: Spring 2020 Key Stakeholder Interviews.

## Year 1 Progress Toward Outcomes

The following performance measures are linked to the program's short-term outcomes. Evaluation results will be organized under each indicator subheading.

- The extent to which the project is implemented as intended (timeline, participants, activities, cost),
- Satisfaction with recruitment efforts,
- Increased student information technology knowledge and "hands on" skills,
- The extent to which stakeholders are satisfied with program components, and
- The extent to which investigators gain increased understanding of faculty and student needs and challenges as the DISC Initiative is implemented.

### Extent to Which Project is Implemented as Intended

The program is being implemented as planned for its first year. Enrollment in each course by transfer students is high and the project is also operating within cost and inside its projected timeline for activities.

Table 1. Course Enrollment Demographics	Pre-Award Enrollment (n=19)		Year 1 2019-2020 (n=18)		Total Active Enrollment (n=37)	
	#	%	#	%	#	%
<b>Sex</b>						
Female	10	52.6%	3	16.7%	13	35.1%
Male	9	47.4%	15	83.3%	24	64.9%

<sup>1</sup> The first scheduled site visit and in-person student focus groups were canceled due to COVID-19 and resulting campus closures in Spring 2020.

<b>Ethnicity</b>						
White/unknown	8	42.1%	9	50.0%	17	46.0%
Domestic students of color	11	57.9%	9	50.0%	20	54.0%
<b>First generation</b>	5	26.3%	6	33.3%	11	29.7%

The program is on target for its enrollment goals. The beginning of the project (July 2019), saw enrollment at 18 new students, increasing the program from 19 to a total of 37 currently enrolled students. Certifications were not achieved this year due to the closing of the college and testing center site. Enrollment, retention, and demographic information for Year 2 program participants will be finalized for reporting in Fall 2020 after program enrollment has closed.

### Extent to Which Curriculum is Implemented as Intended

Curriculum implementation did not come without challenges but is being implemented as planned. Software allowing for learning and troubleshooting, NetLab+, a high-tech virtualization software, was purchased for student use. Faculty also created modules in NetLab which were then integrated into course curriculum to provide “hands-on” experiences for students where they were able to apply classroom knowledge and practice skill sets that mirror the job experience. As reported further on in this report, students found use of this software to be a valuable enhancement to their learning. Due to COVID-19, all classes were moved to online instruction. While NetLab+ provided a seamless transition that allowed students to continue learning and demonstrating skill sets, some students struggled with poor Internet connection in using the software to support their learning.

### Satisfaction with Recruitment Efforts

Feedback from students on recruitment efforts for this first year indicate that students became aware of the program from a college advisor (55.6%), followed by a faculty recommendation (11.1%), word-of-mouth from another student (11.1%), a flyer or advertisement (7.4%), or career fair/recruitment event (7.4%). Program leadership should carefully investigate which of these recruitment strategies are most advantageous to grow in order to ensure they can successfully grow the program.

Stakeholder interviews reveal that recruitment is important to the program’s sustainability as well as retention and graduation. Retention and graduation numbers will bring the state funding that will allow the program to continue. Effective recruitment while facing a pandemic is a concern for these stakeholders.

### Verbatim Comments:

- *“We could have tons of enrollment, but a lot of our state funding is based on points for retention and completion and whether you retain from freshman to sophomore year. You can get good enrollment for the freshman year but that doesn’t really relate to any state dollars down the road. We have to keep them, we have to complete them, we have to see them all the way through. We look at the whole picture. If a program has 100% completers, we’re going to keep them because they help us on our funding points. It’s not an easy little picture.”*
- *“I think this program is growing and I think if we can get through COVID-19, I think we will see more growth.”*
- *“Low enrollment - our region is a declining population area so every executive council meeting we have, it’s always enrollment as one of our topics. So that’s always on the front burner.”*

### Increased Student Information Technology Knowledge and “Hands On” Skills

Much valuable information on program impact has been gained from the Year 1 Student Satisfaction Survey. When asked to identify, top of mind, something they have learned in the program that is helpful as they prepare for their career, students identify:

- Programming skills,
- Teamwork,
- Problem-solving, and

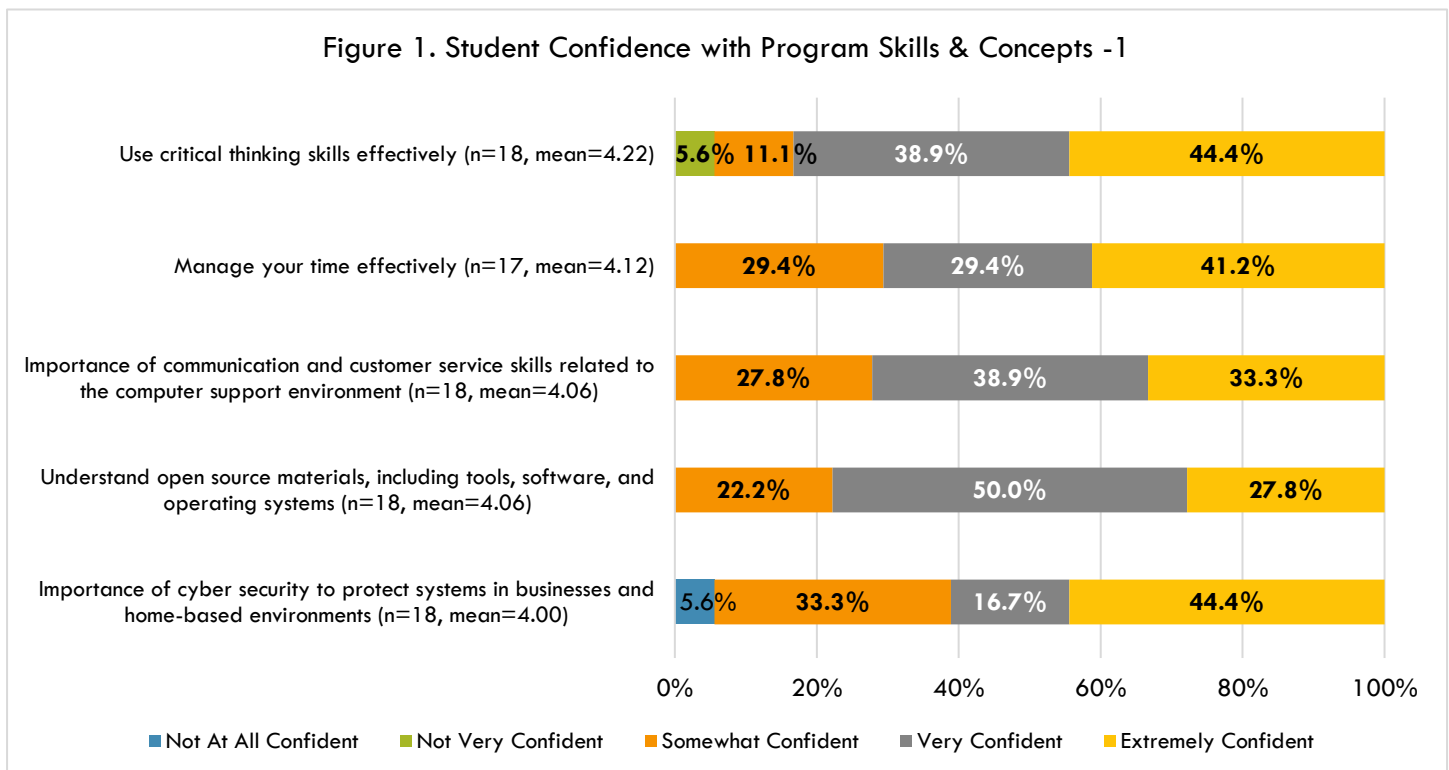
- Understanding operating systems.

Verbatim Comments:

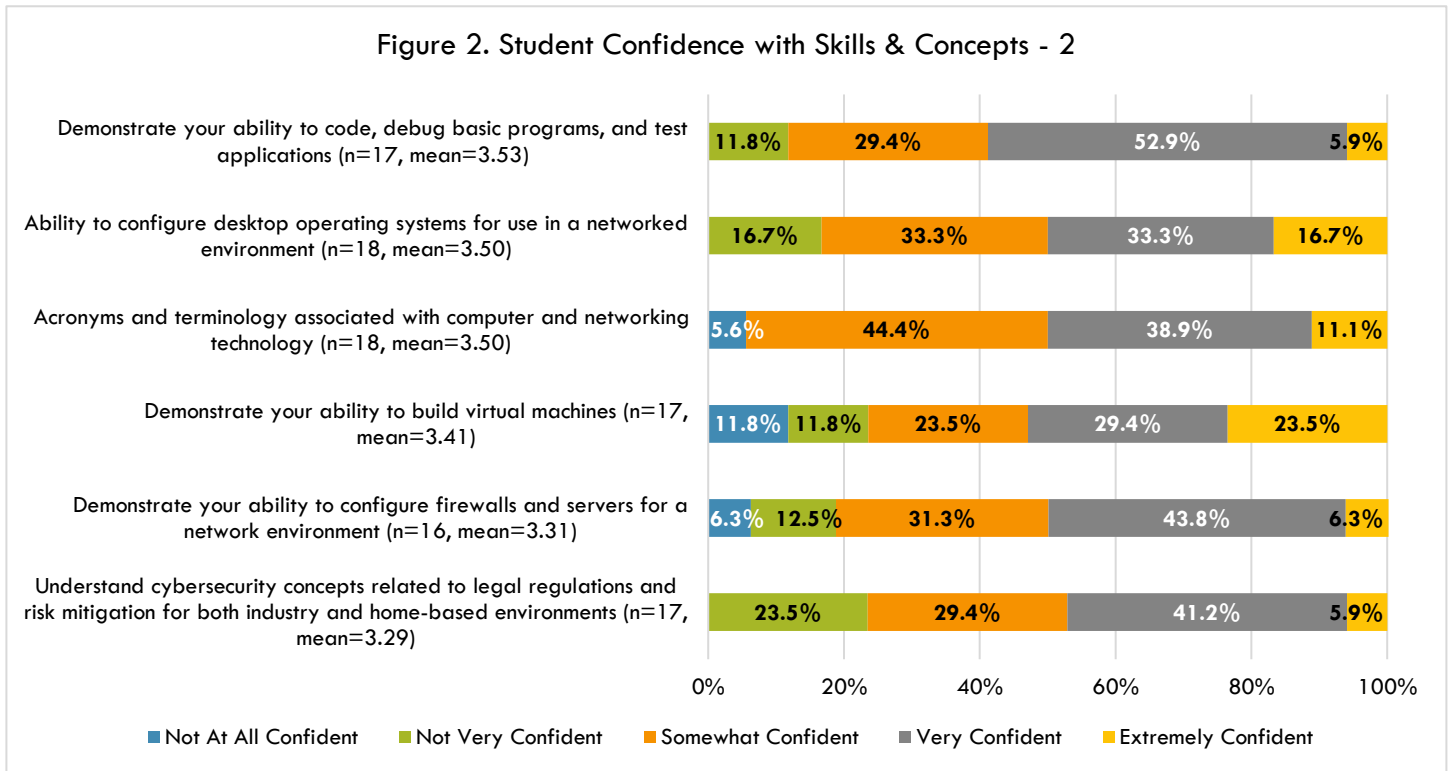
- “There is more than one way to complete goals, and it is a good idea to work with others to solve problems.”
- “The way the programs work and the commands you use to make the programs executable.”
- “The specifics of router function, from IP pooling & distribution to DHCP. Unfortunately, though, Helena’s ISP still doesn’t allow IPv6 connectivity.”
- “That there are different coding languages that I can learn to be more successful.”
- “I learned that computers may seem difficult to others but it’s very easy and understandable. Creating programs and taking all the parts from a computer and putting them back together is the most fun part.”
- “I learned how to build a computer and I was able to get my CIS certificate.”
- “I have learned so many things that it is very difficult to choose just one. Most notably, I have really enjoyed using Netlabs and virtual machines to experience what it’s like working with different OS’s, not to mention the different programs and software we work with in class.”
- “How to think outside of the box.”
- “Computers are only as smart as the person operating it.”

Students were asked to rate their confidence with 11 skills and concepts that are introduced in the program on a scale from 1 (“Not At All Confident”) to 5 (Extremely Confident”). These results indicate that students are benefiting from a curriculum that emphasizes both adaptive and technical skills. More specifically, results indicate that, after this first year of programming, students are feeling more confident about their ability to troubleshoot and problem solve, as well as understand the role of information technology and cyber security in the world – while feeling less confident in their improvement in successfully mastering the technical skills required to be successful in the program and, ultimately, receive their certification.

Figure 1. Student Confidence with Program Skills & Concepts -1



The six items below are those that received lower average confidence ratings from students - none of them average a rating above “Somewhat Confident.”



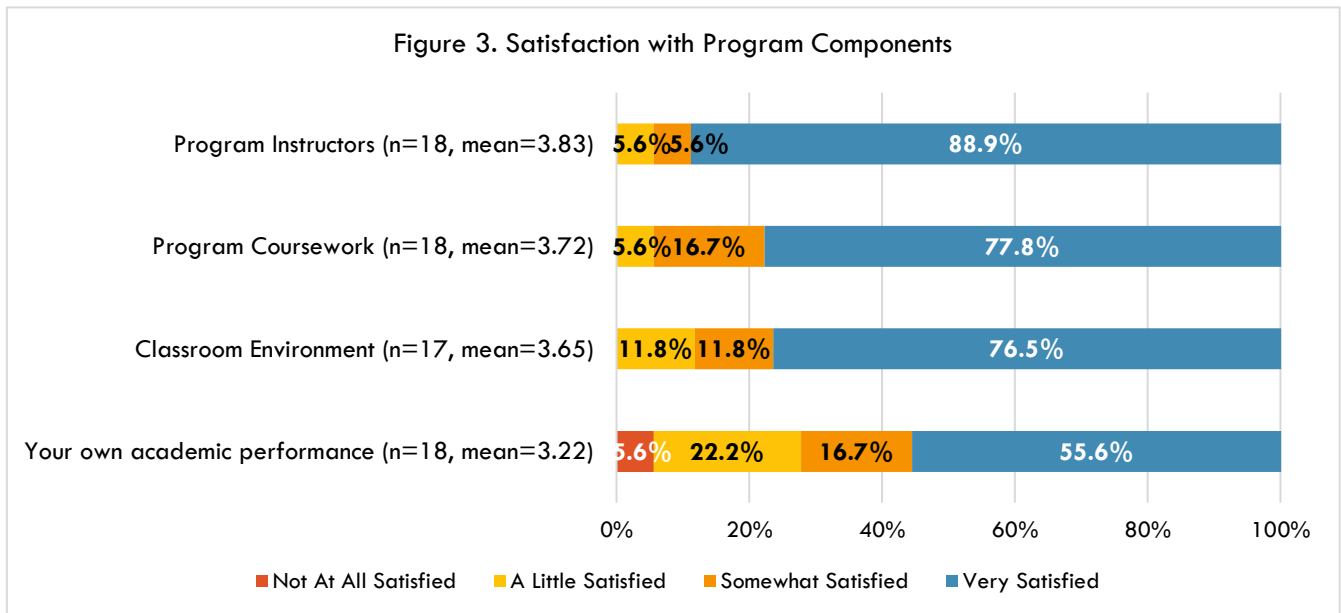
Year 2 feedback from students will uncover whether students gain increased confidence in their technical abilities as they advance further in the program.

**Satisfaction with Program**

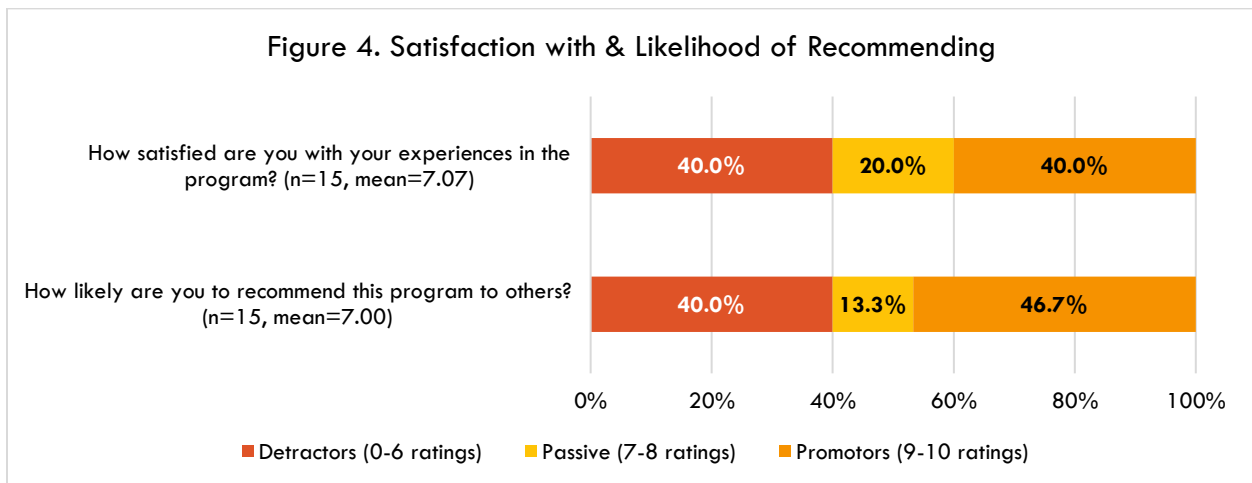
These results are informed by data collected from (1) the Spring 2020 Student Satisfaction Survey, and (2) the Year 1 Advisory Committee survey.

**Satisfaction with Program - Students**

Students are, overall, very satisfied with their participation in the program. Survey results demonstrate that students provided the highest average satisfaction with program instructors. Notably, the only indicator to receive a “Not At All Satisfied” marking was when students rated their own academic performance (see Figure 3, next page).



To measure overall satisfaction with the program students were asked to rate their satisfaction on a scale from 0 (“Extremely Dissatisfied”) to 10 (“Extremely Satisfied”). Students provided an average satisfaction of 7.1 (n=15). Using a similar scale, students were then asked to indicate how likely they are to recommend the program to others. The average likelihood rating provided was 7.0 (n=15).



**Satisfaction with Program – Key Stakeholders**

Stakeholders involved in either implementation or sustainability planning are, overall, very satisfied with the DISC program this first year. Collectively, they tell a story of PCCUA readiness for this type of intensive programming based on their understanding of: the College’s current vision to grow its IT emphasis, the value placed on the program by stakeholders, the identified supports already in place to encourage student success, and the need for such skills in regional industry.

Key Stakeholders identify many important advantages of the DISC program and certification for their college and for their community. Specifically, they note the importance of cyber security as a growing need in the region, the ability of the new coursework to coincide with business college courses, the draw of

students the program is expected to bring, and the need to provide valuable skills to future employees in the community – most notably the banking industry.

Verbatim Comments:

- *“It’s put a higher standard on what the expectation of what we have for our students. Not just in that department, but in other areas too.”*
- *“Cyber security from a banking perspective is absolute top priority, so to have people qualified that can understand the language and the technology and stay on top of it is crucial right now in the banking world. Here in the Delta, we need more opportunities to learn and grow and the program will help get people here with that technological knowledge. So we are able to hire locally. We need more people qualified with that education.”*
- *“It will open doors to where people will consider you for a job. It does show a certain amount of achievement and accomplishment which any future employer is going to look at.”*
- *“It’s such a bonus for our Business and Information Technology departments. There’s just a huge demand for graduates in this region. Maybe not in this town, but there are so many cities and towns close by that can benefit from graduates who have this training. A lot of our students drive in, we pull from a lot of different areas around here. It’s a great draw for us, it helps with enrollment to offer this program because it is so relevant.”*
- *“It’s helped us tighten our student outcomes for work in the network environment and the grant for this program has really helped us identify really specific things that you want to say have impact. They have gone a step further and want students to be demonstrating attitudes and values as they relate to information systems, applied analysis and behavior to problem solving. These are applicable skills that go beyond just the classroom. It’s a broader picture of these applied skills.”*

That being said, Stakeholders brought up important considerations regarding: scalability, marketing during the time of COVID-19, making sure students have the supports to maintain their enrollment, and the importance of integrating critical communication skills into the program curriculum.

Verbatim Comments:

- *“I really think the funding has helped us launch the program but I would love to see other opportunities for grants to accommodate expansion for this so it really could become a more comprehensive program.”*
- *“The hardest problem is getting people, even young people, who have the skills, you have some that don’t want to stick with anything. They don’t get the skills and they come out half prepared and then they wonder why they can’t make it. They need people skills. They need to be able to communicate with people they work with. They will have to work with people whether they like them or not and they have to be able to communicate with them.”*
- *“Lack of jobs in the area. Business outsourcing.”*
- *“To be honest, COVID-19 has done a toll on all our programs here. All of these people can do what they need to do remotely if they have to, but we have students that live in areas with no access, so they rely on our computers here at school.”*
- *“There is always the challenge of getting enrollment, offering the classes, and having the instructors available. Stuttgart is a small town. Having a big enough draw for students and helping them stay and realize that the tuition of PCCUA is a heck of a big deal is a challenge.”*

When asked what decisions need to be made to sustain this program after external funding has ended and what evidence of program impact will be needed to support sustainability, stakeholders identify: modern equipment, enrollment and retention numbers, successful faculty hires, and local business interest in and hiring of program graduates.

Verbatim Comments:

- *“One of them is that the student that graduates can go out and get a job and who hires them recognizes that these students have the skills they need to do the job they’ve been hired to do.”*
- *“With any program, maintaining any salaries that are funded by the grant we have to find a way to roll those over into the college budget and helpfully enrollment in those programs will sustain those salaries. The program will be maintaining an enrollment that will easily justify rolling those budgets over into a college-funded budget and the program would sustain itself and maintain itself in the long term. That’s what we aim to do.”*
- *“The businesses in the community hiring more locally instead of going into another area. Looking into the Delta region instead of others for employees. Proof of that.”*



- *“I think they need to be aware of is to have the modern up-to-date equipment, in this case, computers and networks. The industry changes so fast, if you’re learning on outdated machinery, you’re learning behind the curve. There is always going to be a lag.”*

It is this evaluator’s position that consideration of any of these themes can guide program leadership in responding to stakeholder needs in a manner that demonstrates program strengths as it continues to develop in a strong and sustainable manner.

#### Satisfaction with Program – Faculty

Year 1 activities resulted in the hiring of an additional adjunct faculty member and the implementation of the team-teaching model, in partnership with a full-time lead instructor. This provided two adjunct faculty with one full-time instructor for the program on all three campuses and allowed opportunities for faculty to collaborate and learn classroom management skills as well as practice team teaching techniques. Year 2 evaluation activities will include obtaining faculty feedback and satisfaction with program processes as the program will be fully implemented for all engaged faculty.

### Enhanced Faculty Understanding of Student Needs and Experiences

This summary is informed by data collected in the Student Satisfaction Survey and Key Stakeholder Interviews.

To understand resources needed by students, students were asked to provide the extent to which they utilize resources for their program assignments. Regarding the use and helpfulness of program-provided electronic resources, students rely the most on computer labs for program support (82.4% “Very Regularly”), while they are equally split in their use of study groups (30.8% “Somewhat” and 15.4% “Very Much”) and about 6 in 10 rely on faculty tutoring at least “Somewhat” (28.6% “Somewhat” and 28.6% “Very Much”). A majority of those that utilize these resources rate them as at least “Somewhat” helpful, with 94% agreeing the computer labs are “Very Much” helpful.

Students were also given the opportunity to provide feedback on their NetLab user experience. Specifically, students were asked to respond to four items about NetLab using a scale from 1 (“Not At All”) to 4 (“Very Much”). These items are suggestive of NetLabs as being functionally usable for students and the value students place on it providing needed “hands on” learning and practical opportunities to learn new skill sets.

NetLab Usability				
	Not At All	A Little	Somewhat	Very Much
<b>Easy to learn how to use</b> (n=15, mean=2.86)	20.0% (3)	13.3 (2)	26.7% (4)	40.0% (6)
<b>Easy to navigate</b> (n=15, mean=2.93)	13.3% (2)	20.0% (3)	26.7% (4)	40.0% (6)
<b>Providing a “hands on” learning experience</b> (n=15, mean=3.26)	6.7% (1)	20.0% (3)	13.3% (2)	60.0% (9)
<b>Providing practical opportunities to learn new skill sets</b> (n=15, mean=3.20)	6.7% (1)	20.0% (3)	20.0% (3)	53.3% (8)

Students recommend improving the Netlab user experience by providing students with more understanding of how to troubleshoot areas hard for them to understand.

#### Verbatim Comments:

- “Quicker POD loading; better HTML code in the central site. Giving us the ability to set times manually instead of having to click the magic pixel to set the start time; a built-in content panel instead of having to constantly switch between it & the VMs.”
- “I really love using Netlabs. It is one of my favorite things that we have used in classes so far.”
- “Netlab is a good tool but sometimes it can be confusing.”
- “It’s difficult to understand.”
- “It wouldn’t work properly for me.”
- “I would say nothing needs to be changed it works very well now.”
- “A lot of times it crashes or stays down.”

When asked, overall, if there were any additional resources or support that should be provided to students through this program, students recommend more hands-on experience, guidance to support services, and better Internet connection and computers available for coursework.

#### Verbatim Comments:

- “Working computers.”
- “To have learned everything I need for the future when I am going to be on my own.”
- “More hands-on and things to be explained more.”
- “I’m autistic and the COVID19 epidemic came right in the middle of me trying to get the correct support services. Others, I imagine, would be very much positively impacted by the inclusion of the features I’ve suggested above.”

- *“A really good Internet connection.”*

### COVID-19 Challenges

COVID-19 caused both PCCUA campuses to close early Spring 2020 and greatly impacted program functioning. While about one-third (29.4%) found it “Not At All Difficult” or “A Little Difficult” to transfer all their course experiences to an online format, 41.2% found it “Somewhat Difficult” and 29.4% found it “Very” or “Extremely” difficult. Additionally, 11.8% were “Not At All/Not Very” Confident they would successfully complete all their Spring 2020 courses while 38.9% were only “Somewhat Confident” they would be successful. Overall, only half (50.0%) therefore, were “Very/Extremely” confident they would succeed in this new environment, demonstrating the dependency of students on on-campus resources and in-person instructional support – most notably the use of computer labs. Students identify the greatest challenge they overcame in this transitional environment as:

- Learning how to turn in assignments online,
- Staying motivated and focused,
- Poor Internet connection at home,
- Communicating with instructors over email, and
- Unreliability of Blackboard.

### Verbatim Comments:

- *“The bugginess & unreliability of Blackboard. Recently, in fact, I’ve learned that Blackboard has a bug that can keep you from even seeing your assignments in the first place... which is a pretty major bug, if I’m being honest. Just because it’s rare doesn’t make it acceptable.”*
- *“Not having classes to anchor my work around.”*
- *“The fact that it happened in the middle of the school year is what made it really difficult. Suddenly we had to begin holding online meetings to discuss work which just isn’t the same as being in class. It is hard for me personally to maintain a school schedule at home. I need structured class times to ensure that I have time to get my school work done.”*
- *“The greatest challenge I have had to overcome is being required to ask my instructors questions over email. I much rather prefer to ask academic questions in person, so I may more clearly communicate and even demonstrate what I do not understand or where I need help.”*
- *“My Internet connection at home and Blackboard messing up.”*
- *“Motivation and staying focused. Going to school every day but Fridays really helped my stay focused and motivated. Being at home, I have found it to be rather difficult.”*

**Students report that they need: reliable Internet access, time and space to study, computers, and communication/personal support from faculty to successfully transition to a fully online PCCUA education environment.**

### Verbatim Comments:

- *“Internet access, time and study space.”*
- *“College books and reliable Internet and Blackboard.”*
- *“Better computers.”*
- *“I have been able to acquire most of the resources I need in one form or another, however Internet access is the most lacking.”*
- *“Internet access, time, study space, PC/laptop, personal support (turns out that anxiety really sucks in a time like this).”*
- *“My personal computer and text books.”*

That being said, the progress in program structure in Year 1 helped the transition to online programming due to COVID-19 occur in a more seamless manner than what would have occurred without the grant-funded supports in place for program students.

## Toward the Future

In this first year of ATE programming, the team collected important baseline and process data from its students and stakeholders, even while COVID-19 disruptions prevented capturing more feedback on the program. Students have highlighted what they most value about the program and offered recommendations for program improvement. Continued student, faculty, and stakeholder feedback, as well as a plan to assess secondary institutional data on enrollment, retention, grades, and number of certifications produced will determine how these, and other indicators of student success, shift over the duration of the program.

Overall, this program is on track in achieving its short-term outcomes. Enrollment numbers are meeting the projected goal for Year 3 completions, the new curriculum is being implemented, the program is hiring new faculty to teach the curriculum, and the college has the support of both administration and local industry. Stakeholders have contributed their feedback on the relevance of the program, support by the community, and how they will measure program impact in considering program sustainability. Next steps in the Year 2 and Year 3 evaluations are to gather data on student retention and career success, faculty satisfaction, and detail on how industry partners become engaged with the newly developed program – with particular focus on the development of a new advisory committee at the Stuttgart campus.