Phillips Community College of the University of Arkansas:

"ATE-DISC Year 1 Student Satisfaction Survey"

A Report To:

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Mullins Consulting
Inspired Social Research & Program Evaluation
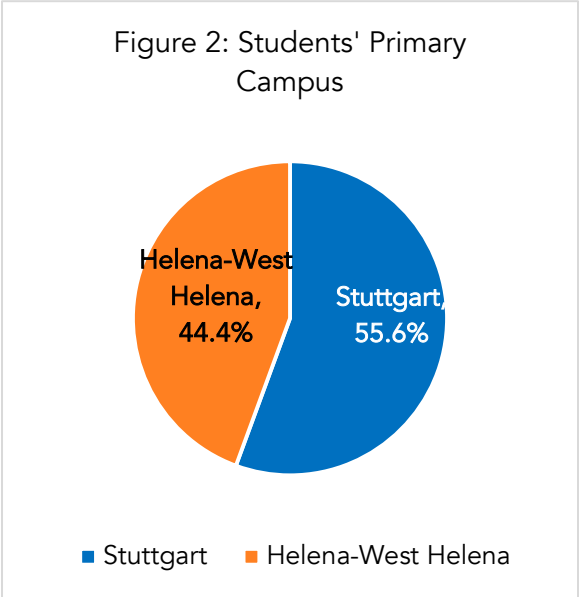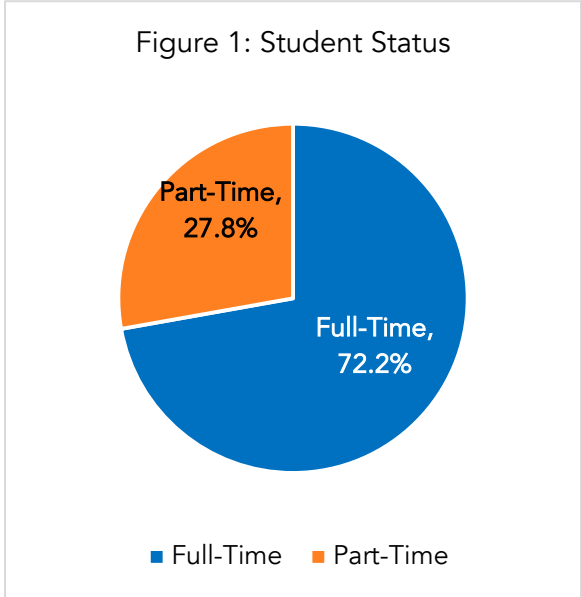
Table of Contents

Introduction

Phillips Community College of the University of Arkansas (PCCUA) Advanced Technology Education (ATE) – Delta Information Security and Cyber (DISC) program has completed its first year with sponsorship from the National Science Foundation (NSF). This report summarizes the results of a survey distributed in Spring 2020 to program students to collect data on student satisfaction with the program, their experiences in transitioning to an online program format amidst the CODIV-19 pandemic, and future career goals. In total, 18 students responded to the survey. Results reported here can help inform the continued development of the PCCUA DISC program.

Student Satisfaction

Demographics

The demographic information reported in this section will help provide an understanding of the 18 PCCUA students who responded to the year one student satisfaction survey.

Respondents are predominantly full-time students. These students come from a relatively balanced split between the Stuttgart and Helena-West Helena campuses.

Figure 1: Student Status

Part-Time, 27.8%
Full-Time, 72.2%

■ Full-Time ■ Part-Time

Figure 2: Students' Primary Campus

Helena-West Helena, 44.4%
Stuttgart, 55.6%

■ Stuttgart ■ Helena-West Helena

Most respondents identify as male and just over half are in their second year of the program. Of the students who indicate "other" as their academic year, they note they are in their "final year," beyond their second year, or between their first and second year.

Figure 3: Students' Gender Identity

Figure 4: Students' Academic Year
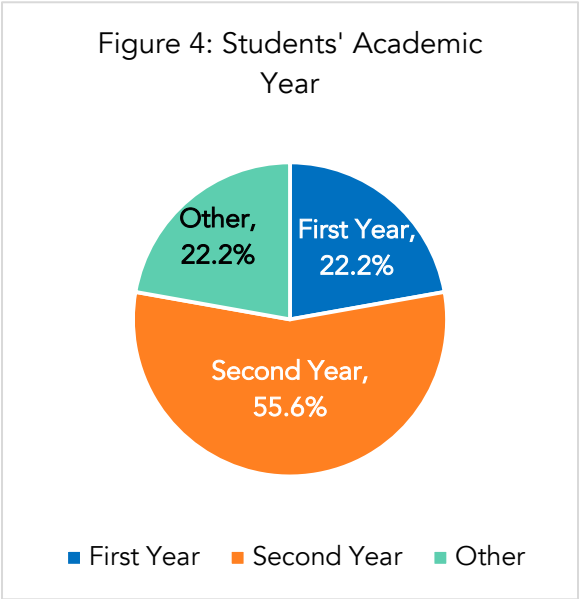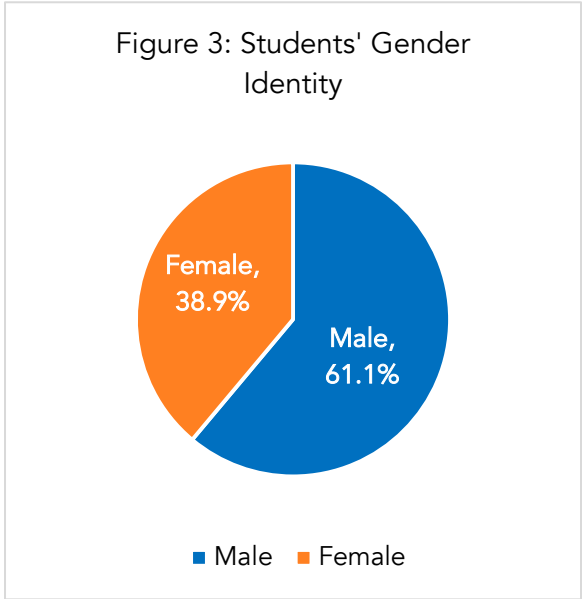
When asked how they learned about the DISC program, about half of respondents indicate that a college advisor made them aware of the program. One student indicated that the program was introduced to them by a family member.

Table 1: How Students Discovered the PCCUA ATE-DISC Program	
	%
College Advisor	55.6% (n=15)
Faculty Recommendation	11.1% (n=3)
Word-of-Mouth From Another Student	11.1% (n=3)
Flyer or Advertisement	7.4% (n=2)
Career Fair or Recruitment Event	7.4% (n=2)
Other	3.7% (n=1)

Note: Students were able to indicate multiple sources, thus the total percent exceeds 100%.

Students were then asked what one thing the program has provided them that they believe will be helpful as they prepare for a career in the Information Systems Technology field. Their responses focus on the tools and programs provided that are important to their future success.

This includes a focus on <u>programming languages and commands</u>, the <u>internal workings of computers</u>, and <u>how to use an assortment of software</u>.

<u>Tools and Programs</u>

"Better understanding of operating systems."

"The way that the programs work and the commands you use to make the programs executable."

"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."

"That there are different coding languages that I can learn to be more successful."

"Learning the acronyms of the commands and programs so we know how they work."

"How to run Microsoft Office effectively."

"The specifics of router function, from IP pooling & distribution to DHCP. Unfortunately, though, Helena's ISP still doesn't allow IPv6 connectivity, so I have no way to put the knowledge on, say, DHCPv6."

<u>Understanding Computers</u>

"All the important parts of a computer."

"I learned how to build a computer and I was able to get my CIS certificate."

"I learned that computers may seem difficult to others but it's very easy and understanding. Creating programs and taking all the parts from a computer and putting them back together is the most fun part."

<u>Other Comments</u>

"There is more than one way to complete goals, and it is a good idea to work with others to solve problems."

"Social engineering."

"I learned that it's important to back up files."

"How to think outside of the box."

"Computers are only as smart as the person operating it."

Program Components

Assessment of the potential impact of the program curriculum and related activities was a focus for the main section of the survey. More specifically, students were asked to indicate their confidence in, satisfaction with, and utilization of an assortment of skills, concepts, and resources. First, students were asked to rate their confidence with 11 skills and concepts that are introduced in the program on a scale from one ("Not At All Confident") to five ("Extremely Confident"). Concepts and skills listed in Figure 5 averaged at least a 4.00 rating and represent

those that received the highest average confidence ratings. The items in Figure 6 are those that received moderate average confidence ratings.

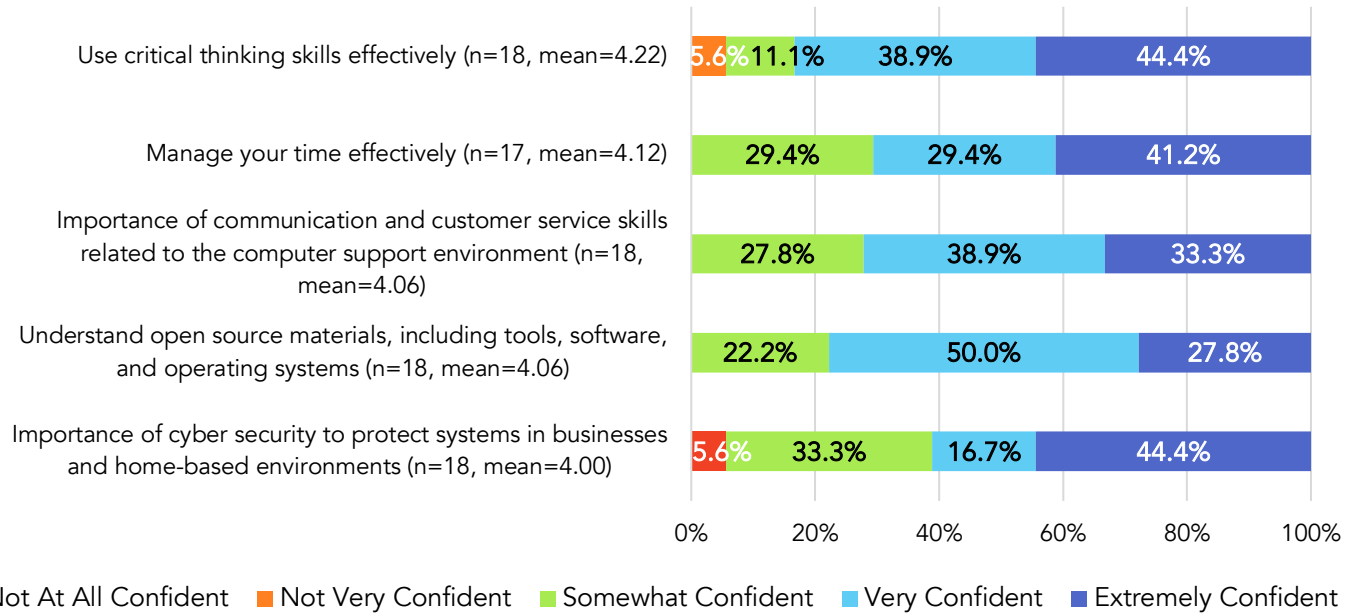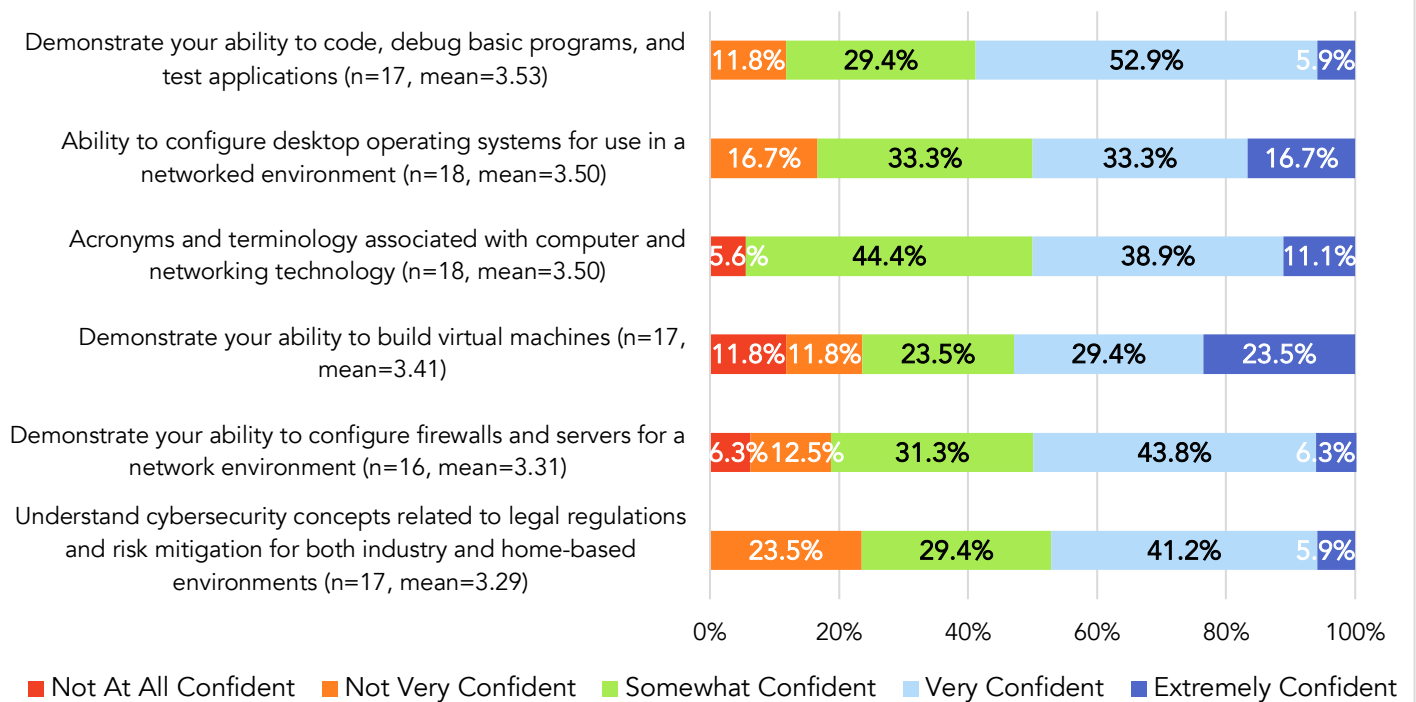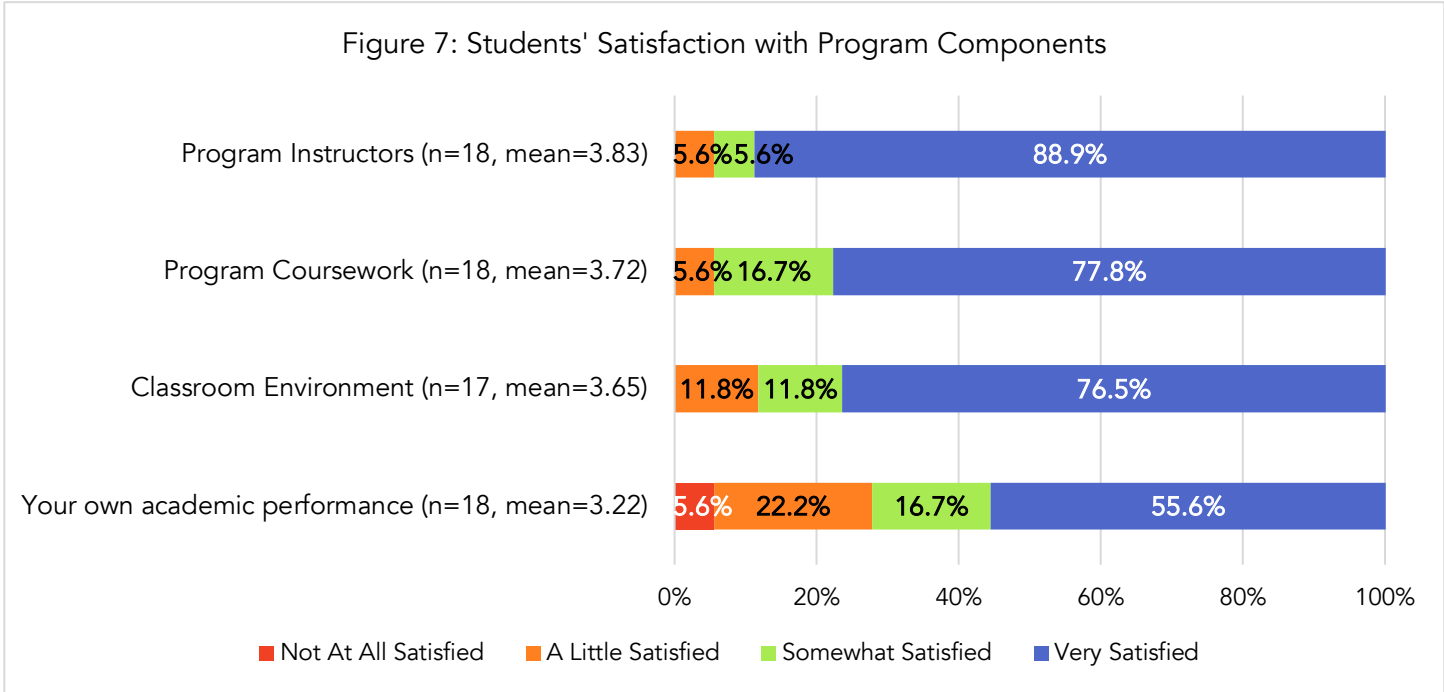**Figure 5: Confidence with Program Skills & Concepts - High Confidence**

Item	Not Very Confident	Somewhat Confident	Very Confident	Extremely Confident
Use critical thinking skills effectively (n=18, mean=4.22)	5.6%	11.1%	38.9%	44.4%
Manage your time effectively (n=17, mean=4.12)		29.4%	29.4%	41.2%
Importance of communication and customer service skills related to the computer support environment (n=18, mean=4.06)		27.8%	38.9%	33.3%
Understand open source materials, including tools, software, and operating systems (n=18, mean=4.06)		22.2%	50.0%	27.8%
Importance of cyber security to protect systems in businesses and home-based environments (n=18, mean=4.00)	5.6%	33.3%	16.7%	44.4%

Legend: ■ Not At All Confident ■ Not Very Confident ■ Somewhat Confident ■ Very Confident ■ Extremely Confident

Figure 6: Confidence with Program Skills & Concepts - Moderate Confidence

Item	Not At All Confident	Not Very Confident	Somewhat Confident	Very Confident	Extremely Confident
Demonstrate your ability to code, debug basic programs, and test applications (n=17, mean=3.53)		11.8%	29.4%	52.9%	5.9%
Ability to configure desktop operating systems for use in a networked environment (n=18, mean=3.50)		16.7%	33.3%	33.3%	16.7%
Acronyms and terminology associated with computer and networking technology (n=18, mean=3.50)	5.6%		44.4%	38.9%	11.1%
Demonstrate your ability to build virtual machines (n=17, mean=3.41)	11.8%	11.8%	23.5%	29.4%	23.5%
Demonstrate your ability to configure firewalls and servers for a network environment (n=16, mean=3.31)	6.3%	12.5%	31.3%	43.8%	6.3%
Understand cybersecurity concepts related to legal regulations and risk mitigation for both industry and home-based environments (n=17, mean=3.29)		23.5%	29.4%	41.2%	5.9%

Legend: ■ Not At All Confident ■ Not Very Confident ■ Somewhat Confident ■ Very Confident ■ Extremely Confident

4

In addition to the 11 provided skills and concepts, two students added additional skills and concepts the program provided them:

- *"Planning is step one in any project."* and
- *"Uses of IPv6 tunneling tools like Teredo, 6to4 and ISTAP."*

Second, students rated their satisfaction with four program components on a scale from one ("Not At All Satisfied") to four ("Very Satisfied"). These students register the highest average satisfaction with their program instructors. However, all four components received average ratings above a 3.00 ("Somewhat Satisfied"). It is noteworthy that the only component to receive a "Not At All Satisfied" rating was the student's own academic performance.

Figure 7: Students' Satisfaction with Program Components

Component	Not At All Satisfied	A Little Satisfied	Somewhat Satisfied	Very Satisfied
Program Instructors (n=18, mean=3.83)		5.6%	5.6%	88.9%
Program Coursework (n=18, mean=3.72)		5.6%	16.7%	77.8%
Classroom Environment (n=17, mean=3.65)		11.8%	11.8%	76.5%
Your own academic performance (n=18, mean=3.22)	5.6%	22.2%	16.7%	55.6%

Finally, students indicated how often they used a phone, a personal computer, or computer lab to complete personal assignments. The average rating provided by students is highest for using a personal computer to complete their assignments (mean=3.83).

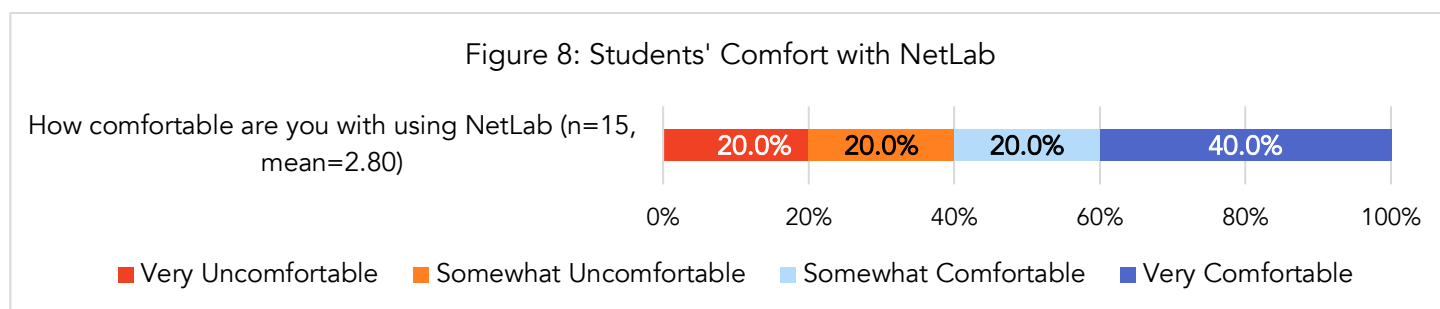| Table 2: Students Use of Electronic Resources for Assignments				
	Not At All (1)	Not Very Regularly (2)	Somewhat Regularly (3)	Very Regularly (4)
Personal Computer (n=18, mean=3.83)	--	--	16.7% (n=3)	83.3% (n=15)
Computer Lab (n=18, mean=3.38)	5.6% (n=1)	5.6% (n=1)	33.3% (n=6)	55.6% (n=10)
Phone (n=18, mean=2.17)	44.4% (n=8)	16.7% (n=3)	16.7% (n=3)	22.2% (n=4)

Support Services and NetLab

To better understand utilization of support services and NetLab, students were asked to respond to a series of questions about their interaction with these services and resources. Specifically, students were asked to indicate how often they used and how helpful they found three support services: study groups, campus computer labs, and faculty tutoring sessions. Both of these questions allowed students to rate each service on a scale from one ("Not At All") to four ("Very Much"). Computer labs averaged the highest *utilization* rating by students (mean=3.71). Comparatively, study groups average the lowest rating (mean=2.38)

Table 3: Student Use of Support Services				
	Not At All	A Little	Somewhat	Very Much
Computer Labs (n=17, mean=3.71)	5.9% (n=1)	--	11.8% (n=2)	82.4% (n=14)
Faculty Tutoring (n=14, mean=2.71)	14.3% (n=2)	28.6% (n=4)	28.6% (n=4)	28.6% (n=4)
Study Groups (n=13, mean=2.38)	23.1% (n=3)	30.8% (n=4)	30.8% (n=4)	15.4% (n=2)

Computer labs also received the highest average *helpfulness* rating (mean=3.82), and all three services received an average *helpfulness* rating above a 3.00 ("Somewhat" helpful). The high helpfulness ratings suggest that these services are important to student success.

Table 4: Student-Rated Helpfulness of Support Services				
	Not At All	A Little	Somewhat	Very Much
Computer Labs (n=17, mean=3.82)	5.9% (n=1)	--	--	94.1% (n=16)
Faculty Tutoring (n=14, mean=3.14)	14.3% (n=2)	14.3% (n=2)	14.3% (n=2)	57.1% (n=8)
Study Groups (n=13, mean=3.00)	15.4% (n=2)	15.4% (n=2)	23.1% (n=3)	46.2% (n=6)

Students were also asked a series of questions focusing on their use of NetLab. First, they indicated how comfortable they are using NetLab. The students averaged a comfort rating of 2.80, which is near "Somewhat Comfortable" on the scale.
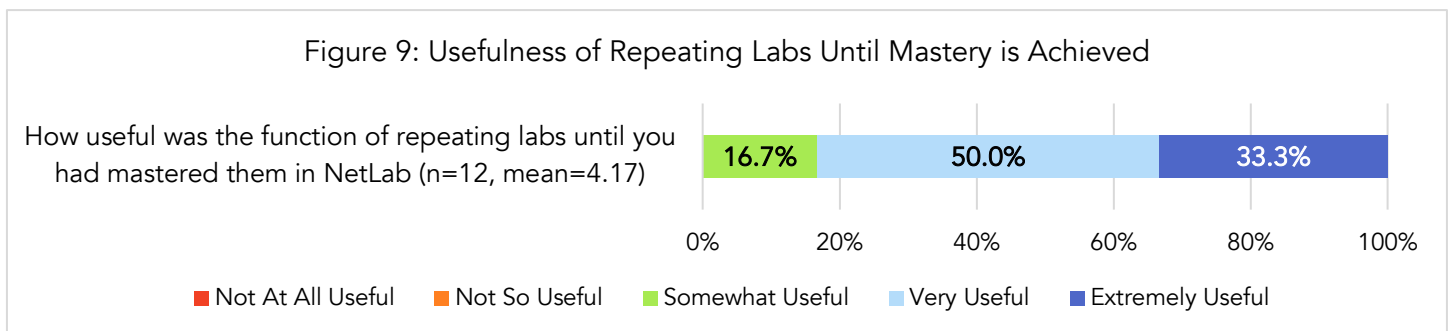
Figure 8: Students' Comfort with NetLab

How comfortable are you with using NetLab (n=15, mean=2.80)

| 20.0% | 20.0% | 20.0% | 40.0% |

0%   20%   40%   60%   80%   100%

■ Very Uncomfortable   ■ Somewhat Uncomfortable   ■ Somewhat Comfortable   ■ Very Comfortable

Second, students were asked to indicate how useful NetLab has been by rating four items on a scale from one ("Not At All") to four ("Very Much"). Providing a "hands on" learning experience received the highest average rating (mean=3.26), while "easy to learn how to use" received the lowest average rating (mean=2.86). This indicates that while NetLab is a beneficial resource, some students need extra support becoming accustomed to the program.

Table 5: Student-Rated Usefulness of NetLab				
	Not At All	A Little	Somewhat	Very Much
Providing you with "hands on" learning experience (n=15, mean=3.26)	6.7% (n=1)	20.0% (n=3)	13.3% (n=2)	60.0% (n=9)
Providing you with practical opportunities to learn new skill sets (n=15, mean=3.20)	6.7% (n=1)	20.0% (n=3)	20.0% (n=3)	53.3% (n=8)
Easy to navigate (n=15, mean=2.93)	13.3% (n=2)	20.0% (n=3)	26.7% (n=4)	40.0% (n=6)
Easy to learn how to use (n=15, mean=2.86)	20.0% (n=3)	13.3 (n=2)	26.7% (n=4)	40.0% (n=6)

Third, using a scale from one ("Not At All Useful") to five ("Extremely Useful"), students indicated how useful they feel the process of repeating NetLab labs until mastery was achieved was for them. The twelve responding students report that this was a useful function for them (mean=4.17).

Figure 9: Usefulness of Repeating Labs Until Mastery is Achieved

How useful was the function of repeating labs until you had mastered them in NetLab (n=12, mean=4.17)

16.7% 50.0% 33.3%

0% 20% 40% 60% 80% 100%

■ Not At All Useful ■ Not So Useful ■ Somewhat Useful ■ Very Useful ■ Extremely Useful

Note: "Not Applicable" responses were not used in the calculation of percentages or average.

Lastly, students were given the opportunity to provide feedback on how to improve the NetLab user experience. Ten students provided a response. These students suggest clarifying, simplifying, or otherwise enhancing the user experience with NetLab. This matches the results displayed in Table 5 and student comments reflect a struggle to understand and work with NetLab at times. Some students did indicate that there are no needed changes.

How can we improve the NetLab user experience?

"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 and the VMs."

"Nothing, I really love using Netlabs and 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."

"I guess try to take a test."

"Dual screen support would help. If that is already a feature, I missed it."

"A lot of times it crashes or stays down."

Overall Satisfaction

To measure overall satisfaction with the program, students were asked to rate their satisfaction on a scale from zero ("Extremely Dissatisfied") to ten ("Extremely Satisfied"). Students provided an average satisfaction rating of 7.07 (n=15), showing that students tend to be satisfied with their experience in the DISC program. Using a similar scale, students were then asked to indicate how likely they are to recommend the program to others. The average likelihood of recommending rating provided was 7.00 (n=15).

Figure 10: Students' Satisfaction with PCCUA's ATE-DISC Program

How satisfied are you with your experiences in the program? (n=15, mean=7.07): Detractors 40.0%, Passive 20.0%, Promoters 40.0%

How likely are you to recommend this program to others? (n=15, mean=7.00): Detractors 40.0%, Passive 13.3%, Promoters 46.7%

■ Detractors (0-6 ratings)   ■ Passive (7-8 ratings)   ■ Promoters (9-10 ratings)
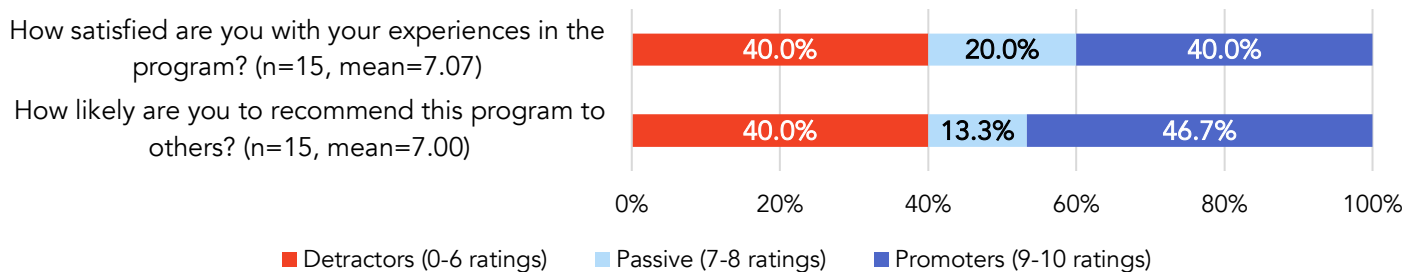
When asked if there were any additional resources or support that should be provided to students in the DISC program, nine students provided a response. While multiple students indicate there is nothing they think needs to be added or they are unsure on what to add, other students focus on the need for functioning computers and effective Internet, hands on activities, and supportive services.

> **What additional resources or support do students need to be successful in this program?**
>
> *"Working computers."*
>
> *"A really good internet connection."*
>
> *"More hands-on and things to be explained more."*
>
> *"To have learned everything I need for the future when I am going to be on my own."*
>
> *"Me, 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."*
>
> *"Time and money."*

Student Career Plans

Students were asked multiple questions related to their knowledge of potential careers, their interest in career specific certifications, and interest in specific areas of employment. To start, students were asked to rate their familiarity with the job demand for Information Systems Technology in the Delta region on a scale from one ("Not At All Familiar") to five ("Extremely Familiar"). On average, students are about "Somewhat Familiar" with the job demand in the area (mean=2.75, n=16).

Figure 11: Student Familiarity with Job Demand

How familiar are you with the job demand for Information Systems Technology in the Delta region? (n=16, mean=2.75)

18.8% 12.5% 43.8% 25.0%

■ Not At All Familiar ■ Not So Familiar ■ Somewhat Familiar ■ Very Familiar ■ Extremely Familiar
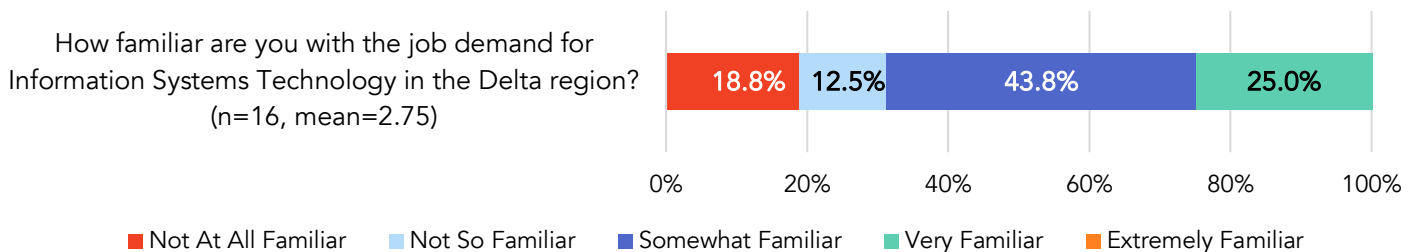
Students were also asked to explain what most influenced their decision to enter the DISC program. Most indicate their interest in computers, connections with other areas of interest, and job opportunities available to program graduates.

> <u>Interest in Computers</u>
>
> *"My love for computers and technology."*
>
> *"Fixing computer and try to program them a lot."*
>
> *"I love computers and technology."*
>
> *"I have always been very interested in computer technology and being on the computer has always been one of my favorite ways to spend my time."*

"I love working on computers."

"I wanted to learn to code. It looked interesting to me and caught my attention."

"My love for technology."

<u>Other Comments</u>

"The similarity between the construction of atoms & the construction of bits/bytes of data."

"I was most influenced by the relationship between graphic design and information systems technology. I first majored in graphic design and, during my studies, discovered how integrated the two are, and I decided to broaden my academic pursuits."

"Taking a Web Design class for my Business Management degree opened my eyes to something I never thought I would have been interested in."

"The instructor told me that there will be plenty of job opportunities in this field."

Provided with six specific careers available to program graduates, students were asked to indicate their interest on a scale from one ("Not At All Interested") to five ("Extremely Interested"). All potential areas of employment received high average ratings from students. Students provided the highest average interest in employment as a computer support/security technician (mean=3.50) and employment as a cyber security analyst (mean=3.50). One student did write in an "Other" response that they would like to be employed by the Special Forces I.T. Branch.

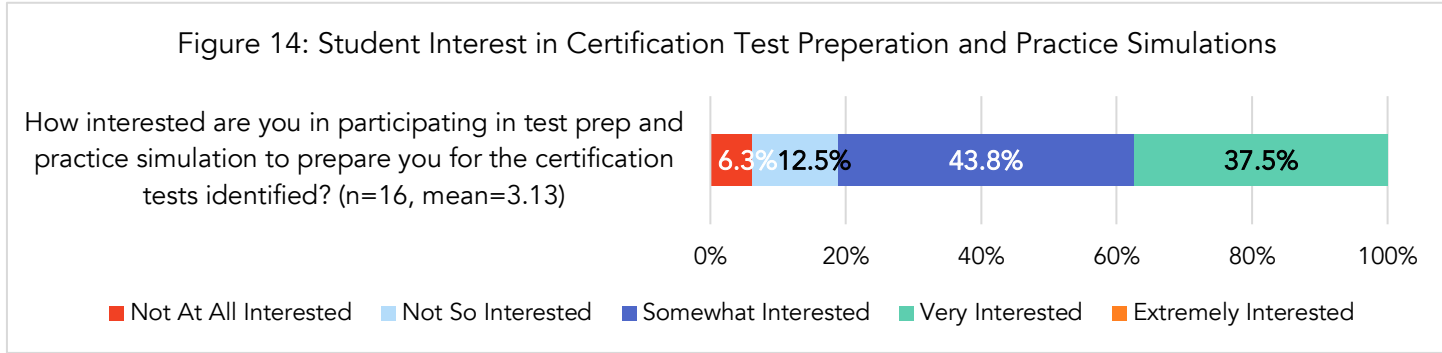Figure 12: Student Interest in Information Systems Technology Careers
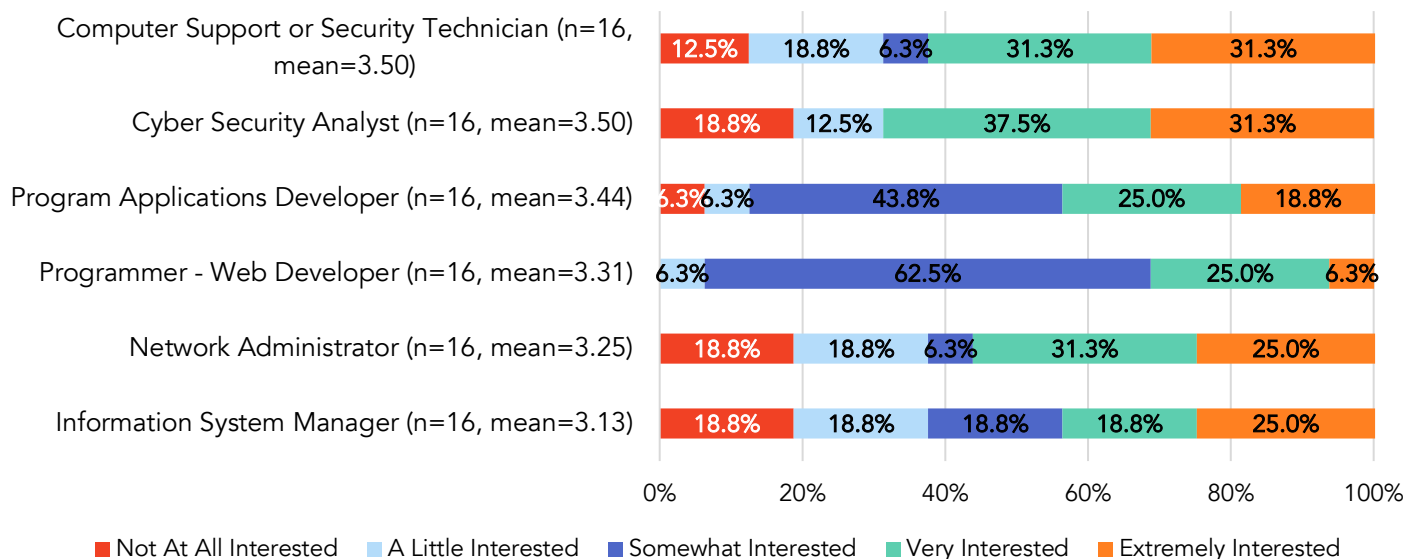
Students were also asked to rate how interested they are in earning five specific certifications: A+, Security+, Network+, Server+, and CompTIA Advanced Security Practitioner (CASP). Students indicated their interest on a scale from one ("Not At All") to four ("Very"). For each of these certifications, some students indicate they "Don't Know" if they are interested in the certification (3 for A+; 1 for Security+; 2 for Network+; 4 for Server+, and; 3 for CASP). That being said, students do report high levels of interest for all certifications. Over 45.0% indicate they are "Very" interested in attaining each of the five certifications asked about.

Figure 13: Student Interest in Industry Certifications

	Not At All	A Little	Somewhat	Very
CASP (n=13, mean=3.15)	15.4%	7.7%	23.1%	53.8%
A+ (n=13, mean=3.15)	15.4%		38.5%	46.2%
Server+ (n=12, mean=3.08)	16.7%	8.3%	25.0%	50.0%
Network+ (n=14, mean=3.07)	14.3%	14.3%	21.4%	50.0%
Security+ (n=15, mean=3.00)	20.0%	6.7%	26.7%	46.7%
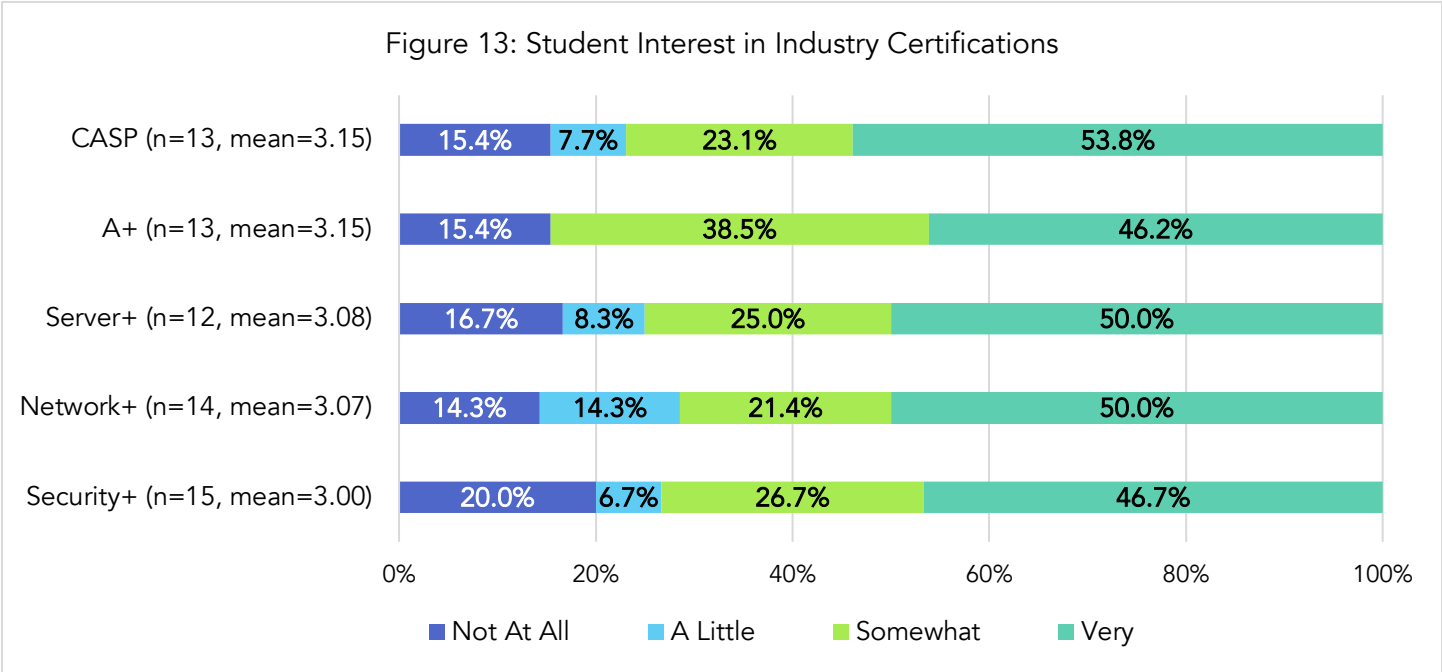
Note: "Don't Know" responses were not used in the calculation of percentages or averages.

Students also averaged a moderate interest in participating in test prep and practice simulations in order to prepare for the above certifications (mean=3.13).

Figure 14: Student Interest in Certification Test Preperation and Practice Simulations

	Not At All Interested	Not So Interested	Somewhat Interested	Very Interested	Extremely Interested
How interested are you in participating in test prep and practice simulation to prepare you for the certification tests identified? (n=16, mean=3.13)	6.3%	12.5%	43.8%	37.5%	

To better understand student interest and awareness surrounding these certifications, program students were asked to provide the extent to which they have been advised on the benefits of obtaining these certifications on a scale from one ("No Extent") to four ("A Great Extent"). Students indicate a strong familiarity with the benefits these certifications provide as they report an average above "Some Extent," and all students report at least "A Little Extent" (mean=3.06).

Figure 15: Student Awareness of Certification Benefits

To what extent have you been advised on the benefits of obtaining professional certifications? (n=16, mean=3.06)

37.5% 18.8% 43.8%

■ No Extent ■ A Little Extent ■ Some Extent ■ A Great Extent
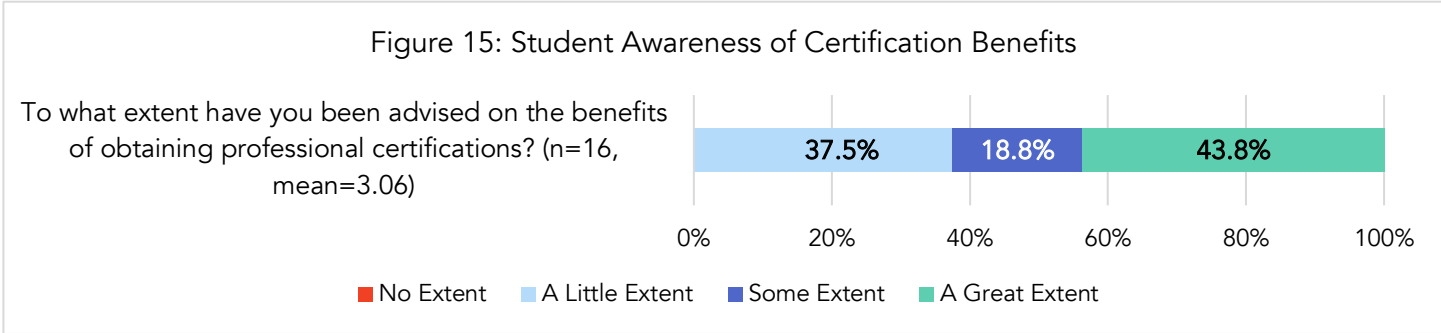
Provided with five different possible career goals, students were asked to indicate which they plan to achieve. Earning an Information Systems Technology degree was the most indicated career goal, followed closely by achieving certification of proficiency in Information Systems Technology. The least selected career goal was transferring schools to earn a higher degree in the field.

Table 6: Students' Current Career Goals	
	%
I plan to graduate with an Information Systems Technology degree	77.8% (n=14)
I plan to achieve certificates of proficiency in Information Systems Technology	66.7% (n=12)
I plan to obtain other industry certifications	50.0% (n=9)
I plan to become employed in the Information Systems Technology workforce	50.0% (n=9)
I plan to transfer for a higher degree in the Information Systems Technology field	27.8% (n=5)

Note: Students were able to indicate multiple sources, thus the total percent exceeds 100%.

When asked if there is anything else they would like the program organizers to know, eight students responded to this question. Most said that there is nothing else they wanted to share. One student reports that they believe their generation has great potential and they hope their instructors help them realize this. Another reports that they are more focused on their other academic major, and therefore unsure if they would want to focus on information systems.


Is there anything else you would like the program organizers to know?

"Our generation is brilliant, if we're given our chance. Humans are inherently varied in their skillset, and this is why it's up to educators to guide every one of us down the right path, so we can be useful to both you, and ourselves."

"I have been taking classes in the information systems technology field to broaden my skills and knowledge. Although the program has been enlightening and enjoyable, I am still not sure whether I would like to emphasize my studies solely in the field of information systems technology."

COVID-19 Pandemic

The COVID-19 pandemic required PCCUA to close the college campus and transition all classes to an online format in the Spring 2020 semester. To better understand how this impacted the students in DISC program, students were asked five questions about their experience with this transition. To start, students were asked if they have utilized the available computer labs to work on their assignments and 58.8% indicate that they have.

Figure 16: Student Use of Campus Computer Labs
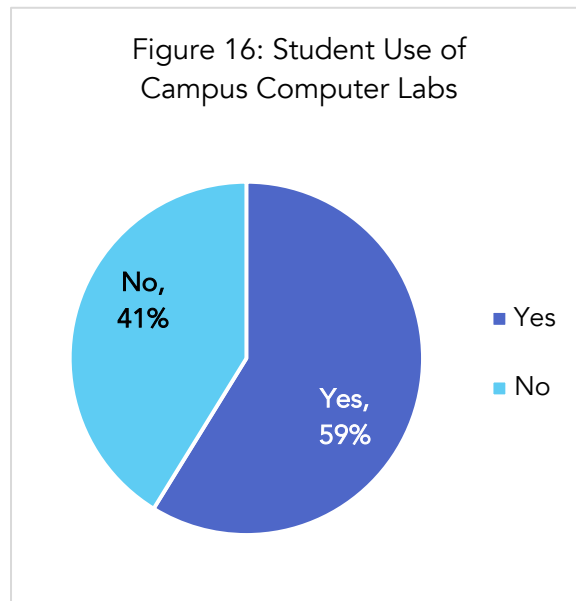
Students were asked two specific questions about the impact the COVID-19 pandemic has had on their academic lives. First, students were asked how difficult it was to transfer their course experience to the online format. Students responded on a scale from one ("Not At All Difficult") to five ("Extremely Difficult"). Students responses provide an average difficulty of
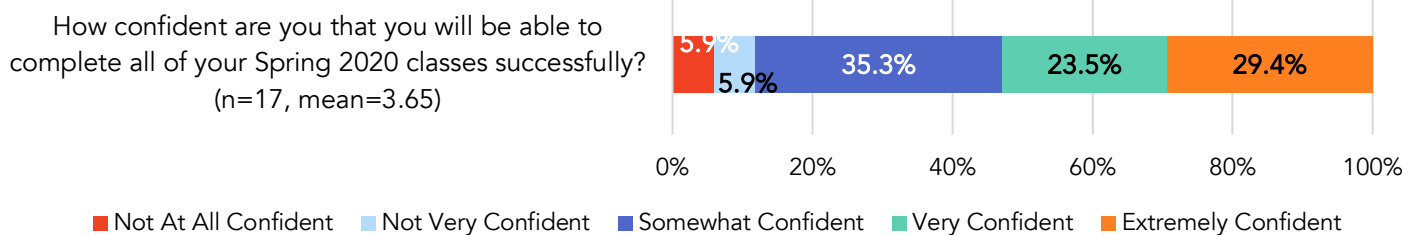
2.94 (near "Somewhat Difficult"), suggesting that there was some moderate difficulty for students transitioning to the online format.

Figure 17: Student Difficulty Transitioning to Online Courses During the COVID-19 Pandemic

How difficult was it to transfer all your course experiences to an online format? (n=17, mean=2.94)

5.9%	Extremely Difficult
23.5%	Very Difficult
41.2%	Somewhat Difficult
17.6%	A Little Difficult
11.8%	Not At All Difficult

■ Extremely Difficult   ■ Very Difficult   ■ Somewhat Difficult   ■ A Little Difficult   ■ Not At All Difficult
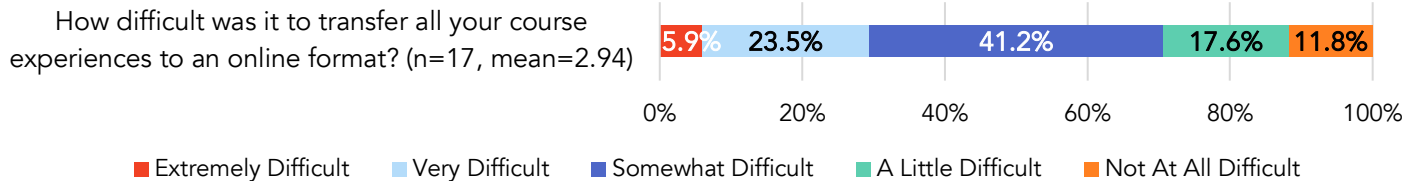
Similarly, students were asked how confident they are in their ability to complete their Spring 2020 classes successfully. Here, students responded on a scale from one ("Not At All Confident") to five ("Extremely Confident"). The high average score of student responses suggests that despite the difficulty in making the transition to the online format, students believe they will be successful in completing their courses (mean=3.65).

Figure 18: Student Confidence in Successful Course Completion During the COVID-19 Pandemic

How confident are you that you will be able to complete all of your Spring 2020 classes successfully? (n=17, mean=3.65)

5.9%	Not At All Confident
5.9%	Not Very Confident
35.3%	Somewhat Confident
23.5%	Very Confident
29.4%	Extremely Confident

■ Not At All Confident   ■ Not Very Confident   ■ Somewhat Confident   ■ Very Confident   ■ Extremely Confident

To better understand the difficulty they have faced in transitioning to an online program format, students were asked to explain the greatest challenge they experienced during the transition. Thirteen students responded, and they focus on issues with personal technology access, difficulty or confusion in doing their schoolwork online, and the increased burden from losing the physical environment around which their schedule was previously organized and within which they could previously interact with their instructors. One student also explained that Blackboard had made things more difficult for them.

In concluding the COVID-19 specific questions, students were asked what resources they need to help transition to the PCCUA online education environment. Twelve students responded, with most explaining that they need technological assistance of some sort as well as more time.

"Better computers."

"College books and reliable internet and Blackboard."

Other
"My personal computer and textbooks."

"Mostly Time."

"Communication. I didn't know how we were moving the labs online."

Conclusion

Results for Year 1 programming reveal that students in the DISC program are confident in their knowledge related to a broad selection of skills and concepts taught in the program. It makes sense, then, that students also report high levels of satisfaction with the program instructors, coursework, and classroom environment. Students do report, however, some difficulty in learning how to use NetLab. While they report a moderate degree of comfort with the program, NetLab being "easy to use" received a relatively low rating from students. Despite this, students find NetLab to be a useful resource that provides them with "hands on" experience. Students explain that they hope to attain industry certifications in order to help advance their career goals, and that they are moderately interested in help preparing for these certification tests.

All of this culminates into high satisfaction ratings from students and similarly high likelihood that students will recommend the program to others. This is despite these students' experiences in the program during the COVID-19 pandemic, which has forced many schools to transition all learning to an online format. Those responding in this survey indicated that the transition to the online format was, on average, "Somewhat Difficult." Despite this, the students explained that they believe they will still have academic success.

Given the results presented in this report, this evaluator recommends the following:
- Find ways to provide assistance for adequate technology and Internet access for students, especially when the program in in the online format,
- Continue to help students prepare for industry certifications in the program, as opposed to independent test preparation and practice simulations, and
- Provide students increased training on the use of NetLab.

Consideration of any of the above should improve program functioning and facilitate student success – ultimately, producing more IT professionals for the Delta region.