THE RUCKS GROUP LLC

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INFORMATION TECHNOLOGY CAREER PATHWAYS THROUGH A FLEXIBLE APPRENTICESHIP MODEL YEAR 3 EVALUATION REPORT

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EXECUTIVE SUMMARY

Across the country, there is a growing need for a skilled information technology (IT) workforce. While the availability of these jobs has continued to expand, especially in Central Ohio, there have been few opportunities for apprenticeships in the IT sector, despite employers' preferences for employees with "real world" experience. To address this discrepancy, Columbus State Community College (Columbus State) received an award in 2019 from the National Science Foundation (NSF) for IT Work Study Flexible Apprenticeship Model (ITFA). ITFA is aligning students' educational experiences with industry needs through the creation of a model for flexible apprenticeships in IT and IT-related fields.

The current grant builds upon Columbus State's successful Modern Manufacturing Work Study project (NSF DUE # 1400354), funded by the NSF's Advanced Technical Education (ATE) program, to inform the development of the apprenticeship project. Additionally, this project complements funding provided from the Department of Labor's (DOL) Scaling Apprenticeship Through Sector-Based Strategies initiative, which has a focus on adaptation and replication of the program at other institutions (#12730498). Another component of the DOL project is the alignment with five hallmarks for a funded apprenticeship program (FOA-ETA-18-08); however, this alignment has bolstered the development of ITFA, as well. This ITFA grant will have a specific emphasis on the creation of pathways to IT positions for high school students and at other colleges.

Overview of the Evaluative Approach

The Rucks Group, LLC (see Appendix A for author biographies) was contracted to provide external evaluation services for ITFA. Working in collaboration with the project team, The Rucks Group articulated an evaluation plan to address the overarching question of the efficacy of the ITFA project. The evaluation questions centered around six themes: 1) successes and challenges of program implementation; 2) effectiveness of student recruitment and selection to the program and apprenticeships; 3) efficacy of student onboarding and retention processes; 4) apprentices' job-related outcomes; 5) effectiveness of credentialed high school instructor training; and 6) dissemination and adaptation outcomes. Evaluation findings utilized a mixed-method approach that included document review, interviews with the project team, surveys with participants, and other documents indicative of the implementation process.

Findings

Evaluative Question #1: How effectively are the IT programs of study being adapted to include experiential experiences and aligning with industry needs? What opportunities and challenges are emerging in scaling-up the program?

In Year 3, the project team continued and refined their recruitment, orientation, career readiness, employer engagement, CCP pathway, and expansion activities. Notable achievements include improvements to the advisory model, introduction of a gamification mentoring initiative, and expanded employer engagement. The project team continued to successfully navigate the virtual environment, but personnel changes, limited teacher interest, and nascent adaptation at MTC were challenges.

Evaluative Question #2: How effectively are students in general being recruited to the IT work study programs of study? To their apprenticeships?

Recruitment efforts continue to attract an applicant pool that results in solid program enrollment. Program participants are primarily female and White, with young adults comprising a large percentage of the population. While gender demographics reflect the program's success enrolling females as an historically under-represented population in the IT field, disparities remain in apprenticeship selection, with Black or African American students disproportionately under-represented in offers received. Employers report that fewer than 70% of students they interviewed possess the technical skills and knowledge for the position, but both employers and students are satisfied with the apprenticeship selection process, which resulted in 33 placements.

Evaluative Question #3: How effective are the program-specific orientation and work-readiness advising model in increasing student retention and other student outcomes? What components of these models are most and least effective?

Participants continue to view orientation, advising, and career readiness activities as effective. Findings suggest that knowledge gain related to job placement varies, with some indications that interview skills may be a weaker area. However, employers and apprentices both perceive that they are generally well-prepared for their apprenticeship experiences. Just over half of students complete their apprenticeships, but fewer also complete their degree.

Evaluative Question #4: Overall, what differences are the programs of study having on student outcomes?

Over half of students who complete an apprenticeship are converting to full-time employment. Both employers and apprentices express high levels of satisfaction with the apprenticeship experience.

Evaluative Question #5: How effective is teacher recruitment? To what extent are teachers making pedagogical changes based on professional development educational opportunities?

The first cohort of the teacher preparation program highlighted some crucial lessons about ideal candidates, communication, and district readiness. A second cohort has not been identified, and the project team is considering other options for these scholarship funds.

Evaluative Question #6: How has the project and related findings been disseminated and adapted by other institutions?

The project team continues to be engaged in numerous dissemination efforts with frequent conference presentations to share their lessons learned on a variety of project areas. Adaptation at MTC has been limited in Year 3, but a new PI has begun to consider possible additions to their program.

Recommendations

1. The evaluation findings point to continued disparities in a career readiness, and a considerable percentage of apprentices who do not complete their workplace-based experience. The project team must work to understand the barriers that students face both on the Columbus State campus and in their interactions with employers, particularly Black/African American populations.

2. Teacher recruitment stalled in Year 3, and feedback from the first cohort provide some areas that could improve participation in this initiative. First, identify the necessary criteria for this initiative to be operationalized within district structures and consider how the project team representative can provide guidance on a district's CCP processes to achieve effective student recruitment and placement in appropriate courses. Second, engage with districts and with CCP staff to understand the extent to which districts can meet those criteria and the support they need from Columbus State.

3. As Marion Tech continues to work to adapt the model to their campus, the Columbus State team should engage the PI to identify communication and collaboration needs to support implementation. In particular, regular one-on-one conversations outside of project team meetings would help to identify how MTC can learn from Columbus State's experience and how grant funds might be used to increase capacity. In addition, the MTC project team should consider how they might leverage the shift toward virtual roles within in IT to mitigate the scarcity of similar roles within their rural environment.

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BACKGROUND

Across the country, there is a growing need for a skilled information technology (IT) workforce. While the availability of these jobs has continued to expand, especially in Central Ohio, there have been few opportunities for apprenticeships in the IT sector, despite employers' preferences for employees with "real world" experience. To address this discrepancy, Columbus State Community College (Columbus State) received an award in 2019 from the National Science Foundation (NSF) for IT Work Study Flexible Apprenticeship Model (ITFA). ITFA is aligning students' educational experiences with industry needs through the creation of a model for flexible apprenticeships in IT and IT-related fields. The current grant builds upon Columbus State's successful Modern Manufacturing Work Study project (NSF DUE # 1400354), funded by the NSF's Advanced Technical Education (ATE) program, to inform the development of the apprenticeship project. Additionally, this project complements funding provided from the Department of Labor's (DOL) Scaling Apprenticeship Through Sector-Based Strategies initiative, which has a focus on adaptation and replication of the program at other institutions (#12730498). Another component of the DOL project is the alignment with five hallmarks for a funded apprenticeship program (FOA-ETA-18-08); however, this alignment has bolstered the development of ITFA, as well. This ITFA grant has a specific emphasis on the creation of pathways to IT positions for high school students and at other colleges.

This project's specific objectives are to:

1. Create, pilot, and scale an experiential learning model for students in IT pathways to engage employers by leveraging existing and developing new partnerships with industry.
2. Prepare a pipeline of technicians to meet industry demand by partnering with regional high schools to engage students in high school through IT dual credit options.

To meet these objectives, the ITFA project is not only creating an apprenticeship program for IT students but also providing pathways to IT positions for high school students through adapting IT courses for dual high school credit and credentialing high school instructors. Additionally, the ITFA program will be adapted and piloted at the partnering institution, Marion Technical College (MTC).

This report provides an evaluative summary of the ITFA project in its third year.

PURPOSE AND DESIGN OF THE EVALUATION

The Rucks Group, LLC (see Appendix A for author biographies) was contracted to provide external evaluation services for ITFA and has worked collaboratively with project leadership to distill the evaluation methods. Guided by the logic model (see Appendix B), the evaluation is designed to continually gather evidence of impact and enfold formative evaluation for project improvement.

The evaluation questions to be addressed over the life of the project, and which influence the evaluation plan, are outlined below:

1. How effectively are the IT programs of study being adapted to include experiential experiences and aligning with industry needs? What opportunities and challenges are emerging in scaling-up the program?
2. How effectively are students in general being recruited to the IT work study programs of study? To their apprenticeships?
3. How effective are the program-specific orientation and work-readiness advising model in increasing student retention and other student outcomes? What components of these models are most and least effective?
4. Overall, what differences are the programs of study having on student outcomes?
5. How effective is teacher recruitment? To what extent are teachers making pedagogical changes based on professional development educational opportunities?
6. How has the project and related findings been disseminated and adapted by other institutions?

The evaluation uses a mixed-method approach by collecting data from multiple sources to gather data. Towards that end, The Rucks Group reviewed project-level documents such as meeting notes and marketing materials, interview results, survey data, and other documents suggestive of the process of implementing key activities. Additionally, The Rucks Group evaluation team meets regularly with the project team to compare completed activities against planned activities (see Appendix C), as well as to discuss evaluation findings overall and how the findings can inform the implementation of activities.

FINDINGS

Evaluative Question #1: How effectively are the IT programs of study being adapted to include experiential experiences and aligning with industry needs? What opportunities and challenges are emerging in scaling-up the program?

The team has either completed or is on track to complete each of the activities that were planned during the third year. A complete list describing each planned activity and its status is provided in Appendix C. As identified through interviews with the project team (see Appendix D for protocol), Year 3 activities revolved around six main functions: student recruitment, onboarding, advising and preparing pre-apprentices, employer engagement, College Credit Plus (CCP) pathways, and adaptation at Marion Technical College (MTC).

Student Recruitment

Student recruitment efforts begin in the fall with multiple touchpoints to keep students engaged and reiterate key program deadlines and expectations. The program looks for academic success (GPA, placement, college readiness), Ohio residency, interest in technology when identifying potential program participants, and commitment to working towards industry-recognized credentials. Recruitment strategies include a mix of small-scale information sessions for specific populations (e.g., veterans and active duty, ex-offenders, women, persons of color), large-scale community events, camps for high school students, and a targeted email campaign to students who meet eligibility requirements for the program. In Year 3, the project team's consideration of how

to reach specialized populations led to *Be in Demand* diversity panels[1] for women and persons of color. In Year 3, the program team also partnered with Admissions to include ITFA in their events and hired a contract recruiter focused on ITFA recruitment.

Columbus State hosted an IT Night event in October 2021 via live stream, providing an opportunity for current students, prospective students, family members, industry representatives, secondary school administrators, and invited guests to meet Columbus State staff, IT faculty members, employer representatives, and current and former IT apprentices. Attendees learned about career opportunities and the related educational and training options available through Columbus State's IT degrees. The evening event included a general admissions overview of Columbus State, an overview of the ITFA program, a panel discussion that included students and industry representatives, and small-group breakout sessions. A copy of the agenda is provided in Appendix E. Of those attendees who responded to a post-event survey, 100% reported that the program elements were very effective (Figure 1).

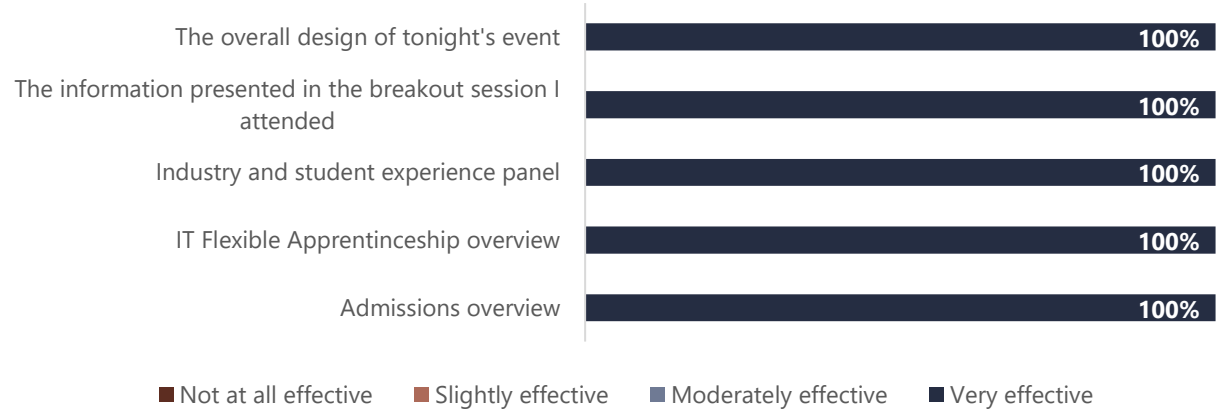


Figure 1. Respondent perceptions of IT Night recruitment event effectiveness (n=4).

The team faces several challenges related to recruitment, including attracting specific populations and limited student applications for scholarship opportunities. One goal for the ITFA program is to attract individuals who are under-represented in the IT field, including women, persons of color, and veterans, but many of these individuals are older and already have additional responsibilities such as families and existing jobs that limit their flexibility to commitment to the program's full-time schedule in the first year. Summer camps, such as GenCyber and Alexa Skill Builder, offer free educational programming and career exploration for high school students and recent graduates, and half of the available spots are reserved for students who identify as women.

Columbus State has multiple scholarship opportunities to support student recruitment and enrollment into information systems technology (IST) programs but has experienced some difficulty in getting students to apply for this financial support. Among the options available to incoming students, *Choose Ohio First* is a full-tuition scholarship for in-demand fields like IST and includes a learning community with access to special services and events. Other scholarships, like Columbus Promise, are open to all Columbus City Schools graduates who are applying to Columbus State regardless of field and with no high school GPA requirement, and the NSF

[1] https://www.cscc.edu/go/be-in-demand.shtml#:~:text=Every%20day%2C%20Columbus%20State%20students,of%20these%20in%2Ddemand%20industries.

Scholarship Program for IST majors is aimed at supporting groups underrepresented in the IT sector, with a 2.6 GPA or alternative criteria requirement for eligibility. As noted on the scholarship website[2], the college "recognizes that many community college students are non-traditional, and a high school GPA may not be sufficient to demonstrate academic promise. Therefore, the team considers students whose GPAs rose significantly during their last two years of high school, and those who have done particularly well in mathematics and science courses and in AP or other advanced courses, participated in computer science-based clubs or competitions, or have been strongly recommended by faculty and teachers. Non-traditional adult students can be evaluated based on other criteria, such as work history, military service, and volunteer activities. These scholarship programs offer variety of wraparound services to further support students in their path to a credential.

Orientation

In Year 3, the project team made several changes to their orientation process to provide more structured support for students. Orientation is a two-part process at Columbus State: Onboarding Workshops and Program Orientation. The Onboarding Workshop, formerly call "pre-orientation," is a program overview facilitated by the advising and students services support team. The "pre-orientation" term was confusing for students, so the project team adopted a term consistent with employers by calling them "onboarding workshops" where key program concepts and responsibilities are explained and tools for their success are provided.

First, the project team developed new Onboarding Workshops (see slides in Appendix F), which are held before the Program Orientation for all Columbus State ITFA students. It instructs new students on the program requirements and how to navigate college resources, register for classes, and apply for financial aid, as well as other topics. These sessions are limited to 20 students and review specific information and timelines, including the benefits of experiential learning, program requirements, college resources (academic calendar, learning management system, email, etc.), financial aid, and ITFA support.

The purpose of the Program Orientation is to build enthusiasm for the program, build relationships amongst program participants and all stakeholders/staff, and to help the students understand their commitment and responsibilities as program participants. The Program Orientation builds on the Onboarding Workshop providing a more in-depth overview; introducing students faculty in the program, the ITFA staff team, employer partners, career services team members, program alumni, and current students; and Career Services leads training on the Handshake system. Students who attended the ITFA orientation found it to be an effective program, as shown in Figure 2.

[2] https://www.cscc.edu/services/financial-aid/choose-ohio-first/

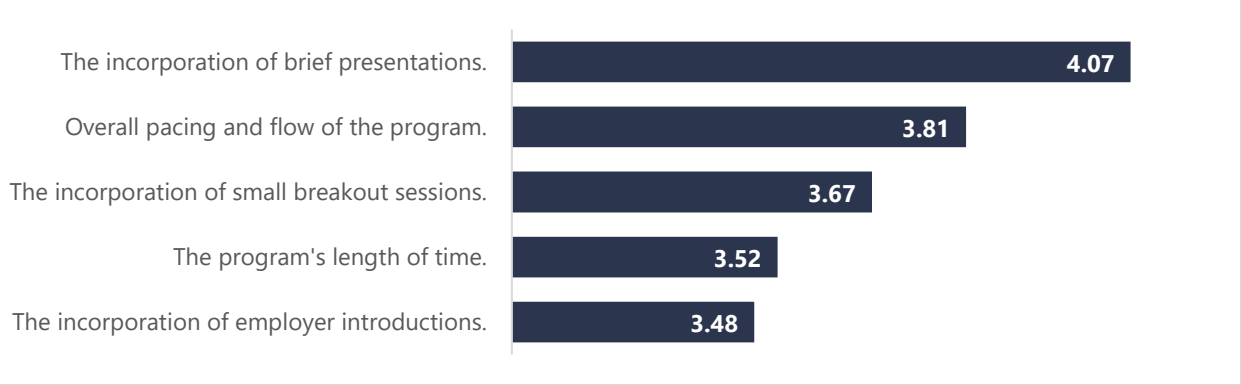


Figure 2. Mean participant ratings of the orientation program components. The response scale: 1=not effective at all to 5=extremely effective.

Advising and Career Readiness

Advising. In Fall 2021, the project team implemented an advisory meetings model to help students keep up with program requirements. Three advisory meetings are held during the academic year – one at the start of each term and another at mid-Fall in time for spring registration – with individual follow-up appointments after each meeting. Spring workshops are aimed at helping students with class registration and includes an opportunity to hear from students who have had apprenticeships. This model was adopted in part as a response to students' reported difficulty registering for capstone in Year 2 and it provides an additional opportunity for students to meet one another.

In addition to advisory meetings, the project team has also made several improvements to student communication. In particular, the increased use of text messaging in addition to email to reach students has been particularly successful. The team also implemented Microsoft™ Bookings for students to schedule appointments and communicate what they need ahead of time and Handshake for career readiness and employer interactions. To improve case management, the advising team worked with Institutional Advancement to generate automatic reports on key success indicators, such as class drops and grade changes, so that they can track student progress and intervene more effectively.

Career Readiness. Career readiness activities continued to include a series of workshops aimed at helping students to prepare for networking and interviewing with employers. These workshops address resume writing, professionalism, LinkedIn, networking, and interviewing.

In addition, a new gamification initiative was introduced in response to employer partners' desire to connect with students earlier in the program. (e.g., engage earlier than the resume sharing and/or networking phases of the process). Led by Career Services, this four-part program is low-risk for students and can be less intimidating than more formal "high-stakes" employer engagement opportunities for students.

The team articulated a few challenges in the career readiness process, particularly around student awareness, balancing expectations and opportunities, and student engagement. They noted that students did not seem to understand the importance of the career readiness components and were not attending needed appointments. The advising interventions described above are intended to help address this issue.

In addition to coursework and career readiness workshops, students have the opportunity to participate in several synergistic activities to further develop their skills and marketability, including Cyber Meet-ups, Hackathon events, and AWS Academy bootcamp. Cyber Meet-ups are designed to facilitate student learning in both a technical area and in a career development topic. While survey data are limited (see brief report in Appendix G), respondents found the event to be effective. Hackathon events in both the fall and spring semesters attracted over 100 registrants; post-event survey respondents reported that these events were very valuable and found the coding-related content and access to consultants to be very helpful (see Appendices H and I for summary reports). These virtual events were conducted using both Discord and Microsoft Teams with three project tracks that included Java, JavaScript and Python. The events focus on equipping participants with the opportunity to contribute to open-source code via GitHub.

In Year 3, the ITFA program also offered a self-study, bootcamp, and certification opportunity for AWS Cloud Foundations. A virtual information session was held in January 2022 (see slide deck in Appendix J) during which a faculty member and a student shared their perspectives on certification. As show in Figure 3, 25% of students who logged into the course completed all knowledge checks and 10% passed the exam.

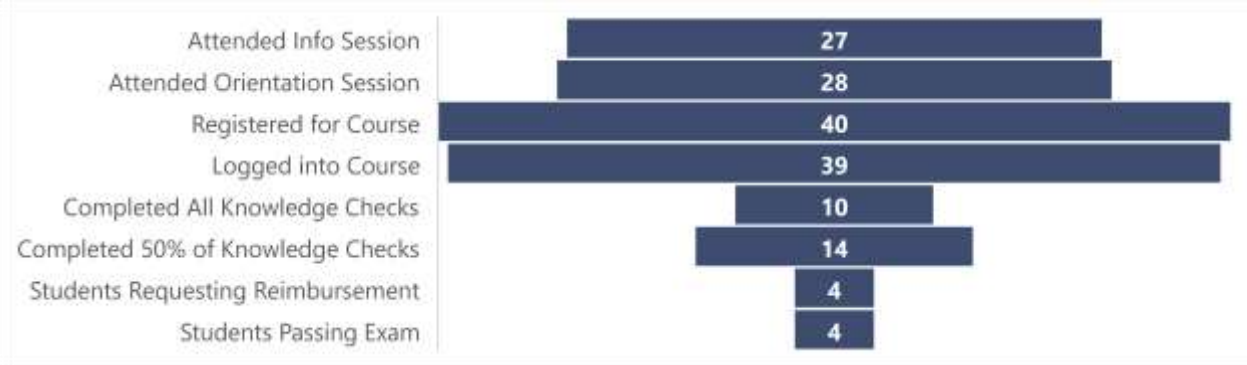


Figure 3. Student progress through AWS Cloud Foundations process.

Students who participated in the bootcamp expressed high level of satisfaction with all aspects of the course, including the materials, instructor, and content (Figure 4). Respondents commented that they would have liked more hands-on practice and a practice exam but indicated that they felt prepared for the exam. All five respondents reported that they planned to register for the exam.

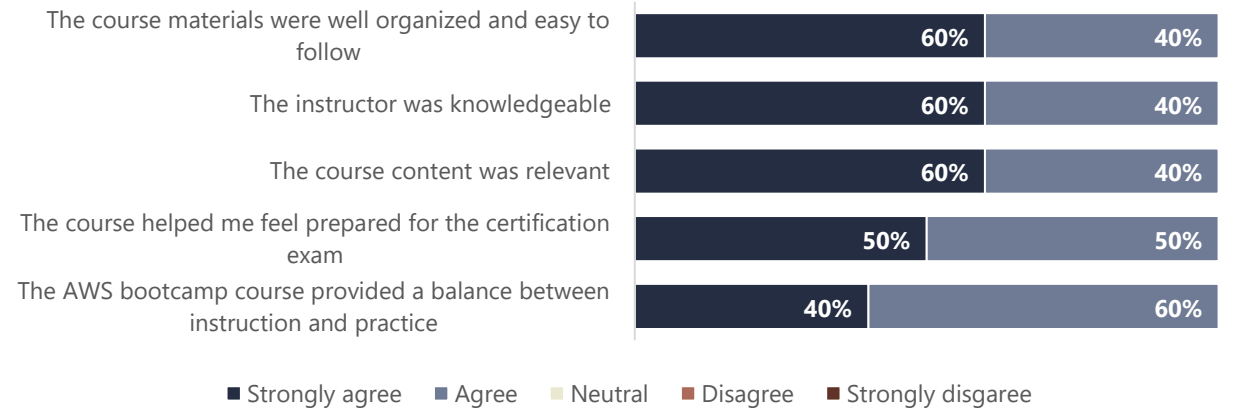


Figure 4. AWS Bootcamp participant satisfaction.

The project team reports that the AWS credential is highly valued by employers. One noted that during network night, employers were writing down which students had earned the AWS credential and employer feedback from last year indicated that they would like to see growth in AWS credentials. The project team is currently discussing whether students who go through AWS Academy could substitute that credential for the CSCI 1130 course, which could be a cost savings for students.

Virtual Environment

At Columbus State, IT students continue to take course loads that are primarily virtual and asynchronous. The 2021 cohort appears to be hesitant about in-person programs, which has led to students not being as involved on campus, and data from several post-event survey support the idea that there is a preference for virtual events among both students and employers (Figure 5). The project team and their campus partners have managed to provide connection and engagement with the college through advisor relationships, intrusive advising approaches, HyFlex classrooms, and co-curricular events to connect them with other students. They note that there are few incentives for students who are in a field that allows them to be at a computer every day and who have done everything virtually in the last two years. While their full-time jobs will likely be virtual as well, they believe that students still need to build a network outside of the virtual world.

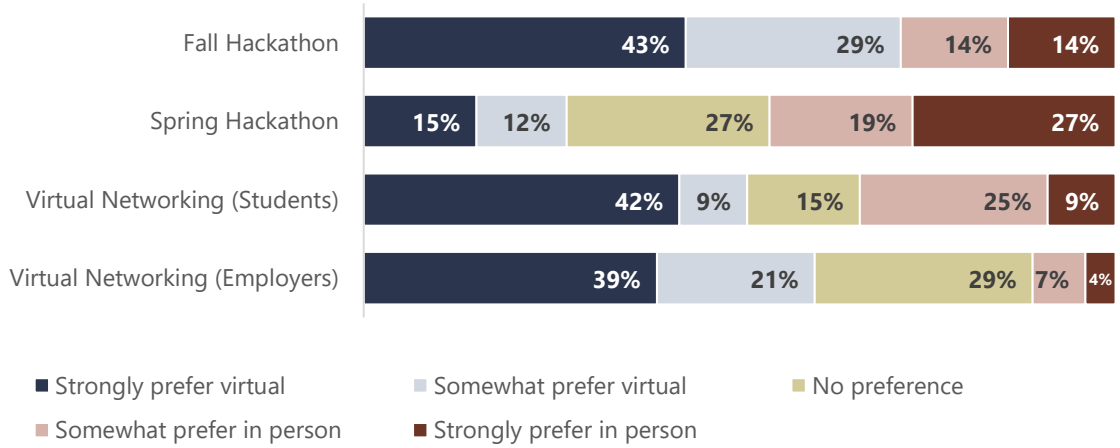


Figure 5. Virtual environment preferences.

Employer Engagement

The ITFA team continues to engage employers in a variety of ways because, as one project team member said, "ongoing employer outreach and long-haul relationship management are key to converting prospects to committed program participants." In Year 3, Columbus State engaged 26 employers in a variety of ways, including employer spotlights, curriculum review and development initiatives, and career readiness activities like the gamification program mentioned above. As one project team member said, *"Ongoing employer outreach and long-haul relationship management are key to converting prospects to committed program participants."*

Business and employer partners were also engaged through ten employer spotlight sessions as an opportunity to share information about their companies and the IT roles for which they hire. In Year 3, Honda, Ohio Department of Jobs and Family Services, State Auto, Core HCM, AEP, GBQ, Buckeye Interactive, EasyIT, The Ohio Casino Control Commission, and Rev 1 Ventures took part in this program. Employers were offered the

opportunity to participate in a spotlight session before they committed to the program, which has led to more engagement and a greater willingness to take on apprentices.

Employers were also actively involved in two key efforts to review and develop the IT curriculum. First, Columbus State faculty led an effort to review the software developer curriculum to ensure alignment with industry expectations and requirements. Employers were invited to share their perspectives through an online survey that asked about the technical and professional skills needed by entry-level employees (see Appendix K for survey questions). Second, a business and industry leadership team (BILT) engaged employers to review the knowledge, skills, and abilities (KSAs) in Cybersecurity and to discuss three-to-five-year trends in how entry-level jobs may change. Faculty are using these opportunities to hear employer perspectives and incorporate what they learn into curricular modifications. For example, employers expressed that they are seeking people who can code responses in Python so Columbus State faculty may re-purpose a course to add more practical application to Python classes and also consider how they can incorporate Python coding and scripting into the student Cyber Club.

IT Pathways in CCP

The ITFA project is also intended to provide a pathway for high school students by adapting IT courses for dual credit (see program flyer in Appendix L) and credentialling high school instructors to provide courses in their districts. In Year 3, the CSCI 1103 course was modified to include career exploration activities and a survey was developed to assess students' perceptions about their effectiveness. The survey will be disseminated in Year 4.

The first teacher to participate in the University of Cincinnati (UC) program to credential IT instructors completed the modules and began teaching in his district. At the time of this report, no additional districts/teachers have expressed an interest in participating in this program. More information about this initiative will be discussed in evaluation question #5.

Adaptation

At MTC, activities continue to be limited, reflecting both early stages of implementation as well as the smaller institutional context as the MTC team considers what elements they currently have that fit the ITFA model. MTC also has a newer PI who is still learning about the grant and what has already been implemented while planning for next year. The primary activities in Year 3 centered on building partnerships with IT professionals, but opportunities are limited in the geographic area as many companies only have one or two IT positions. The PI noted that they are considering what they can adapt from Columbus State and are planning to build a Hackathon and join the National Cyber League next year. He noted that the college's rural location has limitations in terms of the number of employers available, mostly school districts with few IT jobs. Collaboration with Columbus State has been limited.

Conclusions

In Year 3, the project team continued and refined their recruitment, orientation, career readiness, employer engagement, CCP pathway, and expansion activities. Notable achievements include improvements to the advisory model, introduction of a gamification mentoring initiative, and expanded employer engagement. The

project team continued to successfully navigate the virtual environment, but personnel changes, limited district interest, and nascent adaptation at MTC were challenges.

Evaluative Question #2: How effectively are students in general being recruited to the IT work study programs of study? To their apprenticeships?

To date, the program has served 267 emerging-workforce participants (up from 177 a year ago).

Program Recruitment

Recruitment efforts described above resulted in 93 enrolled participants from 125 applications for Cohort 3 (Fall 2021) and 117 applicants to date for Cohort 4 (Fall 2022) at Columbus State. Recruitment programming, including IT Night, is an important element in efforts to raise awareness of the ITFA program. Among attendees, survey respondents reported that the IT Night program was effective in increasing their awareness of the types of apprenticeship opportunities available and level of starting pay in IT fields (Figure 6).

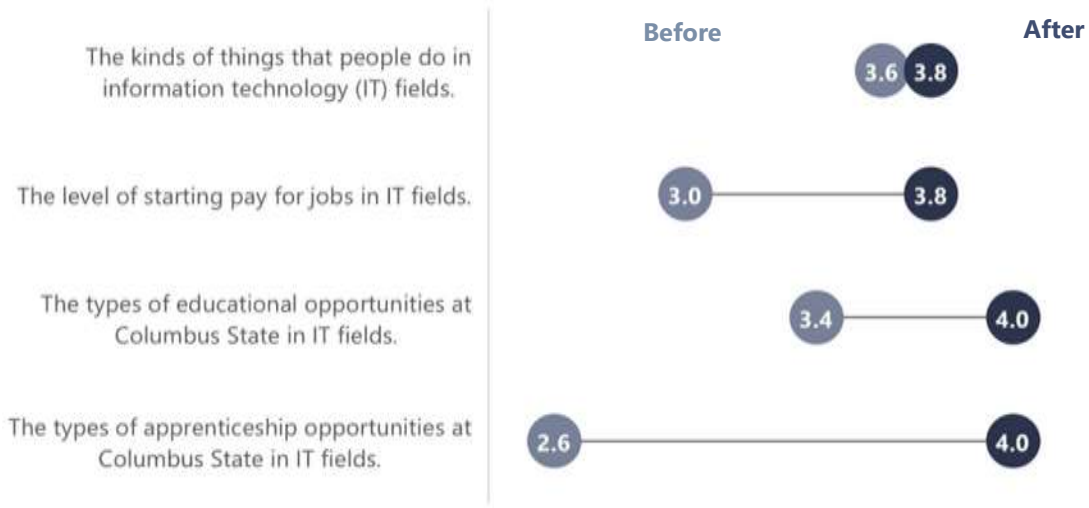


Figure 6. Participant awareness BEFORE and AFTER the IT Night event. Response scale: 1 = not aware at all to 4 - fully aware (n=5).

Diversity

As shown in Figures 7 through 10, current participants are 75% female, 47% are persons of color, and 5% are veterans. Nearly two-thirds have completed at least one year of postsecondary education or more (65%); 25% hold an Associate's, Bachelor's, or Master's degree, and over two-thirds are young adults aged 17-29 (68%).

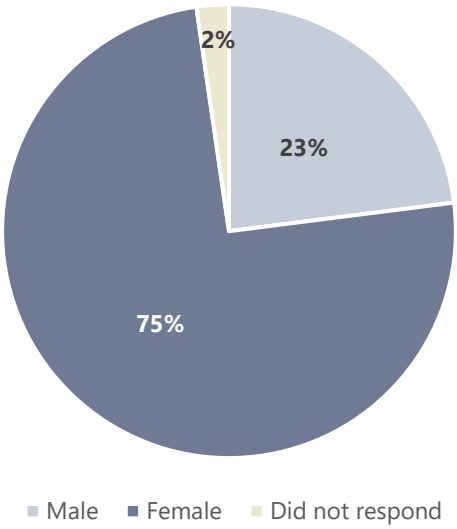


Figure 7. Program participants by gender.

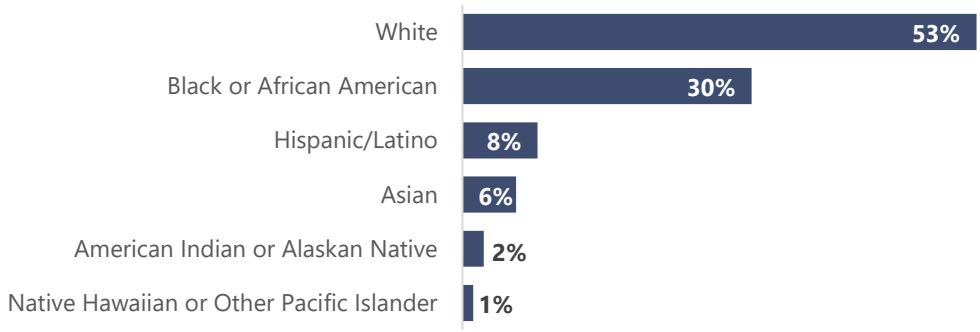


Figure 8. Program participants by race/ethnicity.

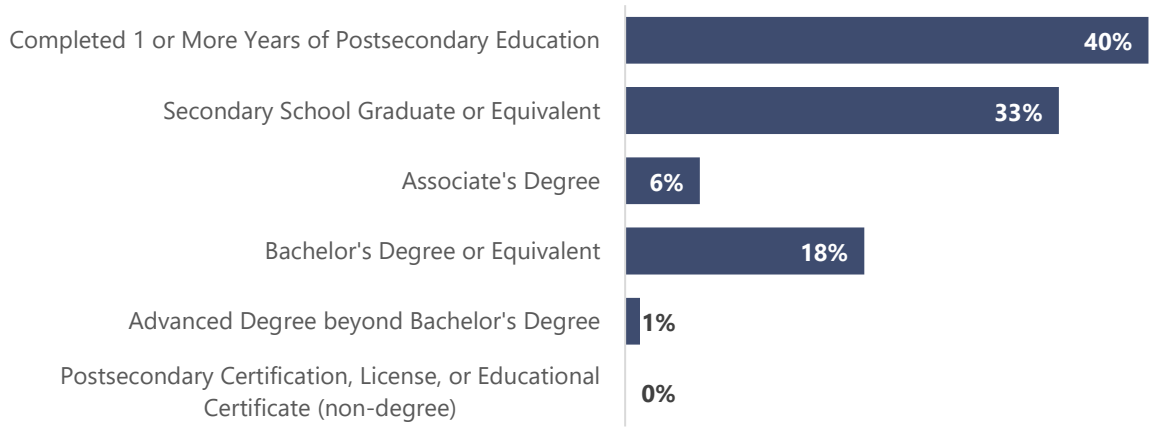


Figure 9. Program participants by previous education.

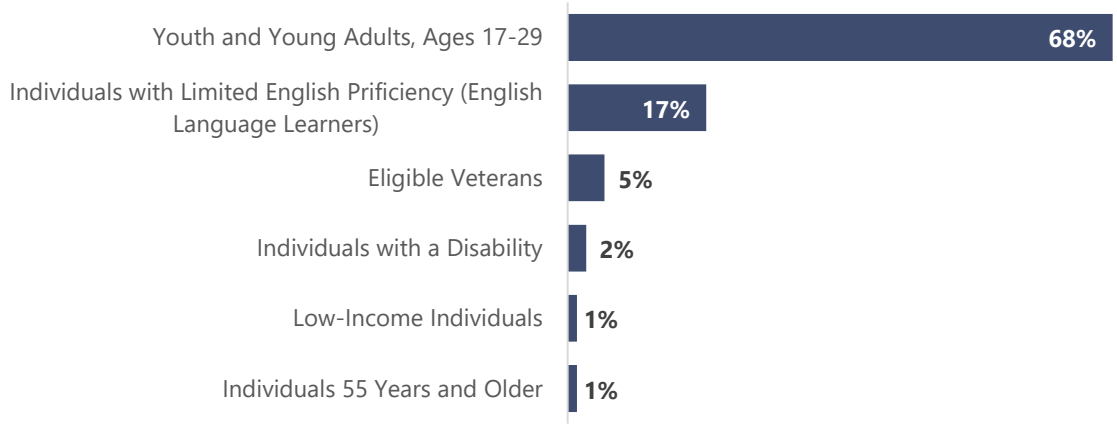


Figure 10. Special populations as a percentage of total participants.

Apprenticeship Selection (Spring 2022)

Apprenticeship selection begins with the compilation of resumes of all career-ready participants into a resume book to be shared with employers and a Virtual Employer Networking event is held. One change in Year 3 is that student GPAs are no longer included in the resume book to address equity and to focus attention on student experiences. Faculty provide narratives on student performance. A timeline overview of the networking, interview, and placement process is available as Appendix M.

Fifty four of 56 eligible students attended the networking event and met with ten employers. Students and employers expressed high levels of satisfaction with the event, with 96% indicating that it was helpful in identifying which interviews they wants to pursue (Figure 11). Both groups noted that they would have liked more time for their conversations.

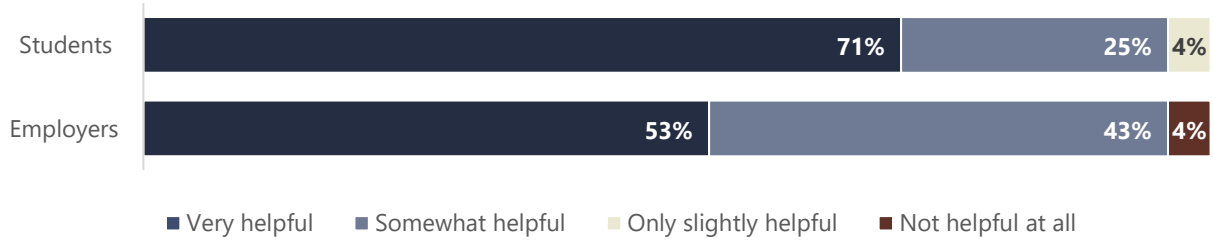


Figure 11. Helpfulness of networking event.

After the event, employers reported that most students presented themselves well (Figure 12). Ratings of "appropriate levels of professionalism" have risen since last year, while ratings of students' professional attire and location in a conducive environment has declined. These changes may be due to students' lack of experience in translating professional in-person expectations to the virtual environment. In particular, employer respondents noted that students could improve their video conferencing etiquette.

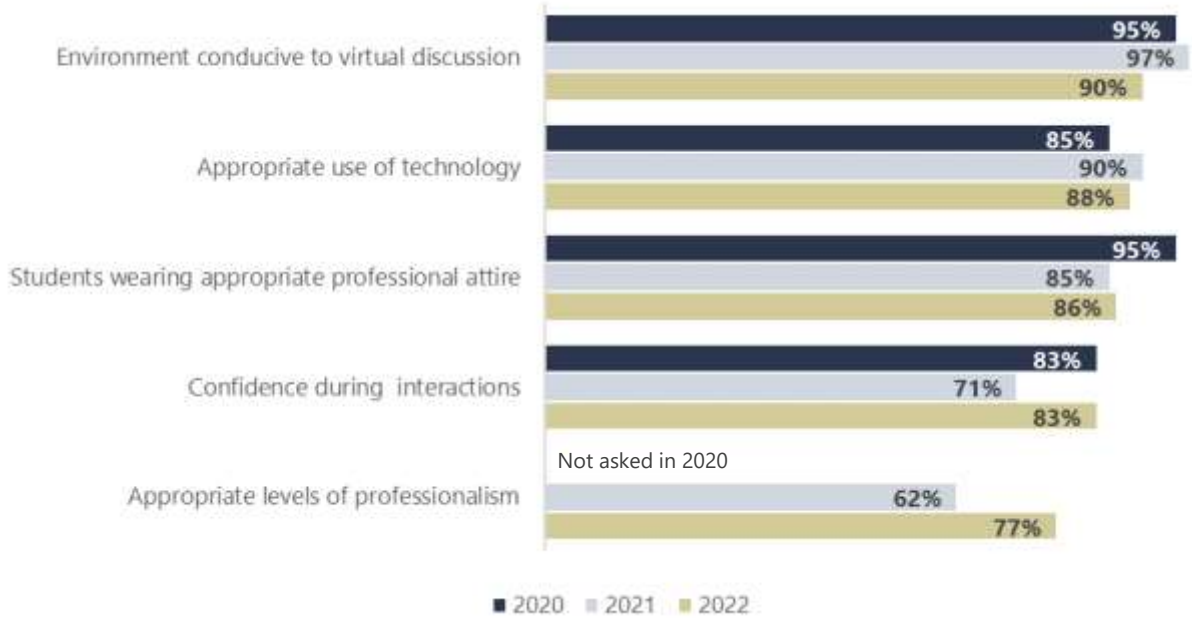


Figure 12. Employer perceptions of student preparedness (n=32).

As a result of the networking event, employers scheduled 158 Round One interviews. Employers reported that nearly all students that they interviewed exhibited appropriate use of technology and were in a conducive environment (Figure 13).

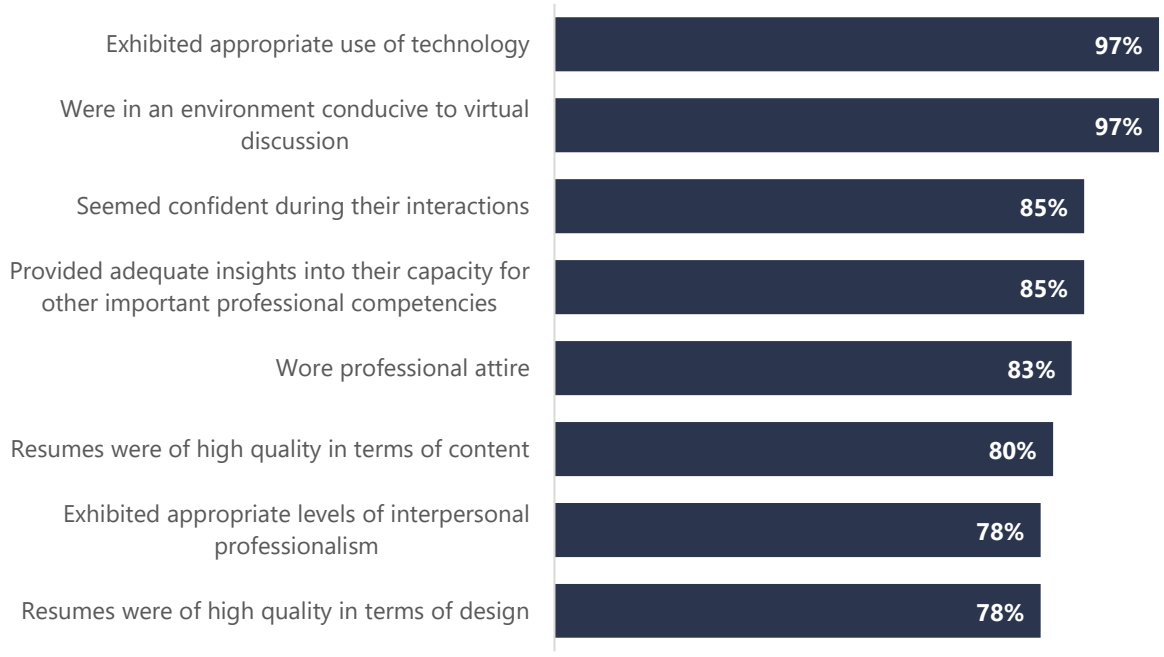


Figure 13. Employer perceptions of the percentage of students exhibiting professionalism during interviews (n=8).

From a student perspective, pre-apprentices participating in interviews felt well prepared in most aspects, but only half believed that they had presented themselves with high levels of confidence, down from 91% in 2021 (Figure 14). These data suggest that there is a disconnect between students' and employers' perceptions of their professionalism. On average, students rated themselves higher on the professionalism of their outfit (100%) compared to the percentage of students whom employers perceived as being dressed appropriately (83%). In addition, only half of students rated themselves highly on their level of confidence, while employers reported that 85% of students presented themselves confidently.

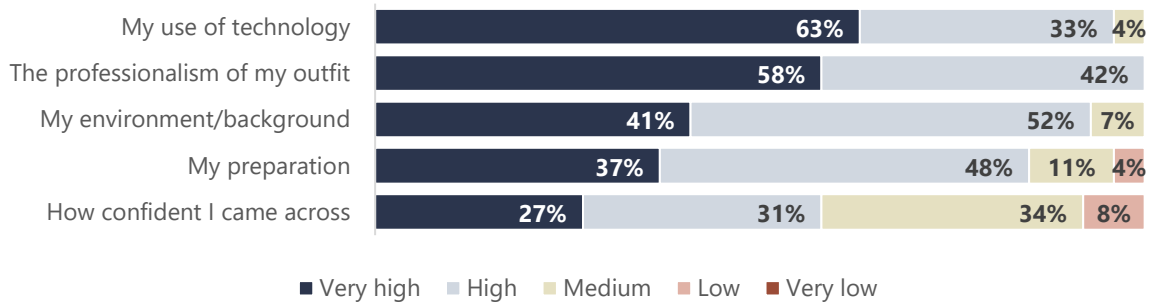


Figure 14. Student perceptions of preparedness (n=27).

While students presented themselves well during interviews, employers perceived that fewer students possessed the technical knowledge and skills needed for the apprenticeship position (Figure 15).

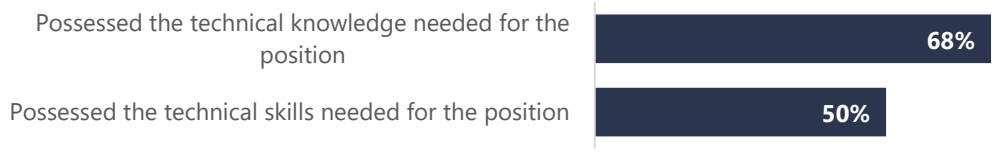


Figure 15. Employer perceptions of students' technical preparation**.**

Employers commented that they would have liked to see certain technical knowledge, skills, and experience in the students they interviewed:

- *Could use more depth in object-oriented design/development concepts, as well as JavaScript frameworks like React.*
- *Many cyber jobs are compliance jobs but most students had no basis to discuss that area. This included top candidates. A standard technical profile relating technical skills would help discern skills candidate to candidate.*
- *Neither had much real world IT experience but this is entry level so we'll train them up.*
- *Version control in git is very important, and very few used git regularly. Only one student had notable experience in software development, even as a volunteer or freelancer.*

Students rated themselves even lower in terms of their technical preparation (Figure 16), with fewer than half indicating high levels of technical knowledge and skills needed.

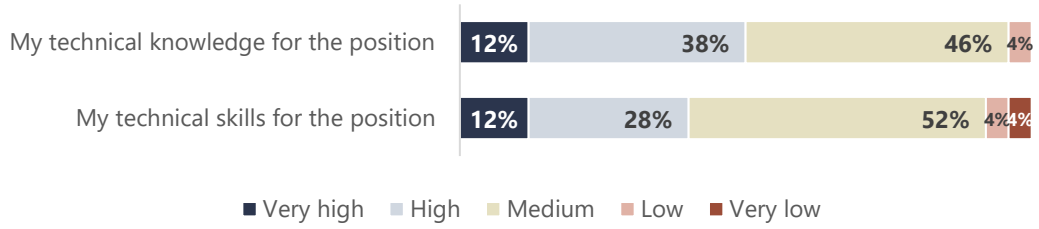


Figure 16. Student perceptions of technical preparation.

Students commented that they believed they could use more knowledge and skills in several areas, including specific software tools and answering technical questions:

- *Coding (n=4)*
- *AWS/Cloud, Frameworks (Spring Boot, React, etc.)*
- *Blue team pen testing*
- *SIEM Tools & Incident Response*
- *Windows Server, Powershell scripting*
- *Open source and team based functionality such as GitHub*
- *Database knowledge*
- *Front end design*
- *I interviewed for four positions. One was "non-cyber" (data analytics). Obviously, I was not prepared for that. Another was very heavily focused on compliance and audit. I have a very basic sense of that area and could have used more exposure to it.*
- *I think I have the appropriate technical knowledge and skills for the position but could have done more preparation around the types of technical interview questions that may be asked in an interview.*
- *I wasn't lacking, I just wasn't aware that I needed to prepare for explicit technical questions and panicked*
- *I would guess my knowledge of JavaScript, as I am just now learning it this summer semester and it was something that they use at State Auto.*
- *Problem solving*
- *Professional IT documentation*
- *Troubleshooting skills*

After two rounds of interviews, thirty-one students were placed in apprenticeships with wages range from $18.25 to $25.10 per hour, reflecting an average of $21.11 per hour. As of this report, one employer was continuing to interview candidates.

Student Diversity

The ITFA program has a particular focus on enabling access for typically underrepresented populations, including women and persons of color. As shown in Figure 17, while women received interviews at a rate similar to men, only 51% of men received an apprenticeship offer compared to nearly all women.

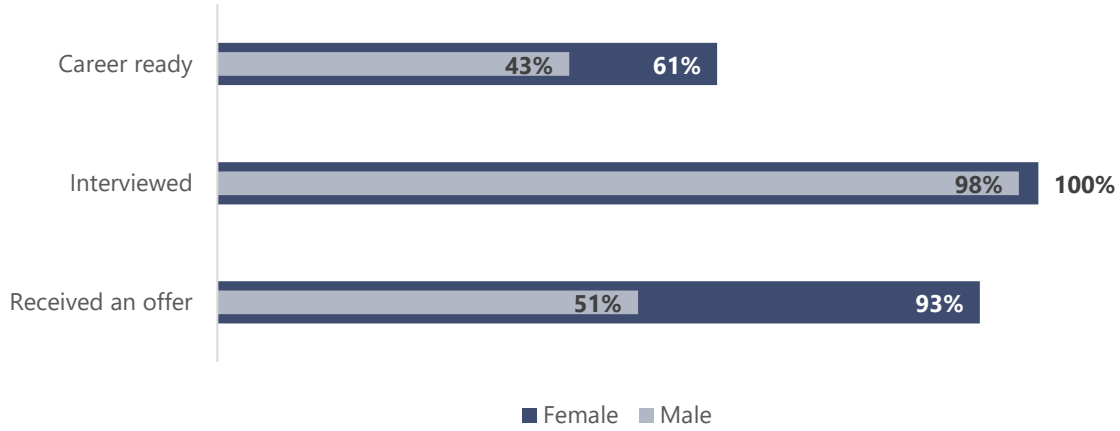


Figure 17. Gender disparities in pre-apprentice preparedness and apprenticeship selection.

Students of color receive interviews at a rate similar to their White peers, but less than half receive an apprentice offer compared to nearly two-thirds of White students (see Figure 18).

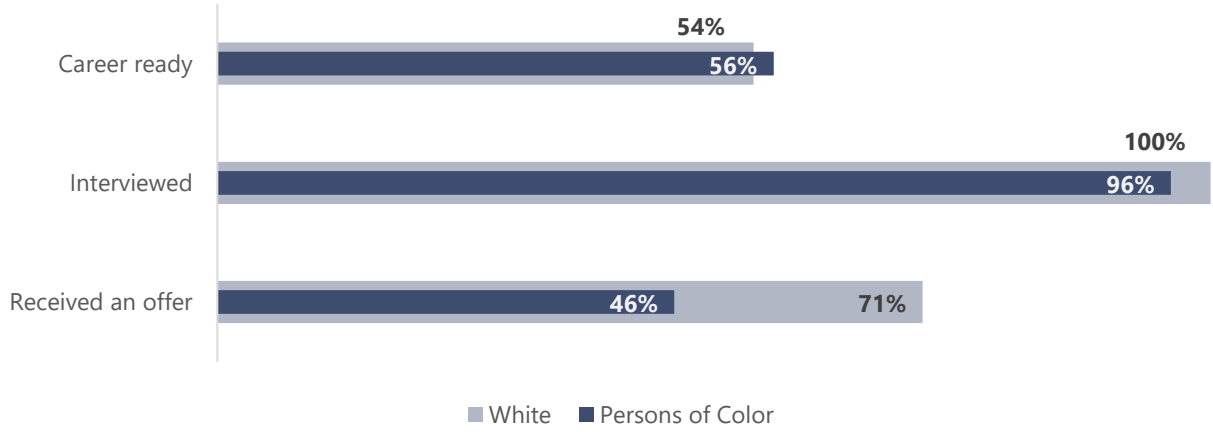


Figure 18. Race/ethnicity disparities in pre-apprentice preparedness and apprenticeship selection.

These race/ethnicity data are even more striking when they are further disaggregated, highlighting the disparities between students who identify as White or Hispanic/Latino and those who identify as Black or African American. Despite earning interviews at nearly identical rates, only 13% of Black or African American students received an offer compared to over half of Asian students and over three-quarters of White and Hispanic/Latino students (Figure 19).

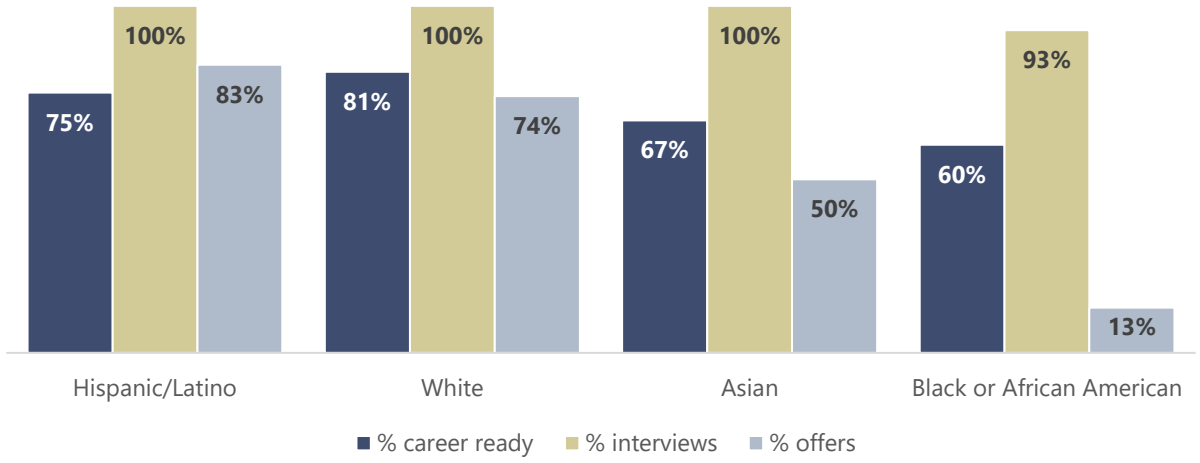


Figure 19. Disaggregated race/ethnicity disparities.

While rates of career readiness are lower among Black and African American students, for those who do reach this benchmark and interview, the data suggest that there are systemic barriers in the placement process.

Conclusions

Recruitment efforts continue to attract an applicant pool that results in solid program enrollment. Program participants are primarily female and White, with young adults comprising a large percentage of the population. While gender demographics reflect the program's success enrolling females as an historically under-represented population in the IT field, disparities remain in apprenticeship selection, with Black or African American students disproportionately under-represented in offers received. Employers report that fewer than 70% of students they interviewed possess the technical skills and knowledge for the position, but both employers and students are satisfied with the apprenticeship selection process, which resulted in 33 placements.

Evaluative Question #3: How effective are the program-specific orientation and work-readiness advising model in increasing student retention and other student outcomes? What components of these models are most and least effective?

An important part of the ITFA program is orienting and guiding students to achieve career readiness and obtain apprenticeship opportunities. Student preparation is accomplished through orientation programming, advising, career readiness workshops, and on-the-job training and support during the apprenticeship.

Orientation Effectiveness

At Columbus State, a July 2021 orientation provided an opportunity for students to learn more about the program and its resources, meet Columbus State staff, IT faculty members, employer representatives, and

former IT apprentices. The all-day event was conducted remotely via live stream and included a departmental overview, an overview of individual majors, an overview of career services, alumni panels, and introduction to employer partners, and small-group breakout sessions. At the end of the event, attendees were asked to complete a brief web-based survey to assess changes in levels of awareness regarding various facets related to the program and perceptions regarding the effectiveness of the event.

Respondents indicated that the program was very effective and reported increased knowledge of the program, available resources, course technology, and apprenticeship opportunities (see Figure 20).

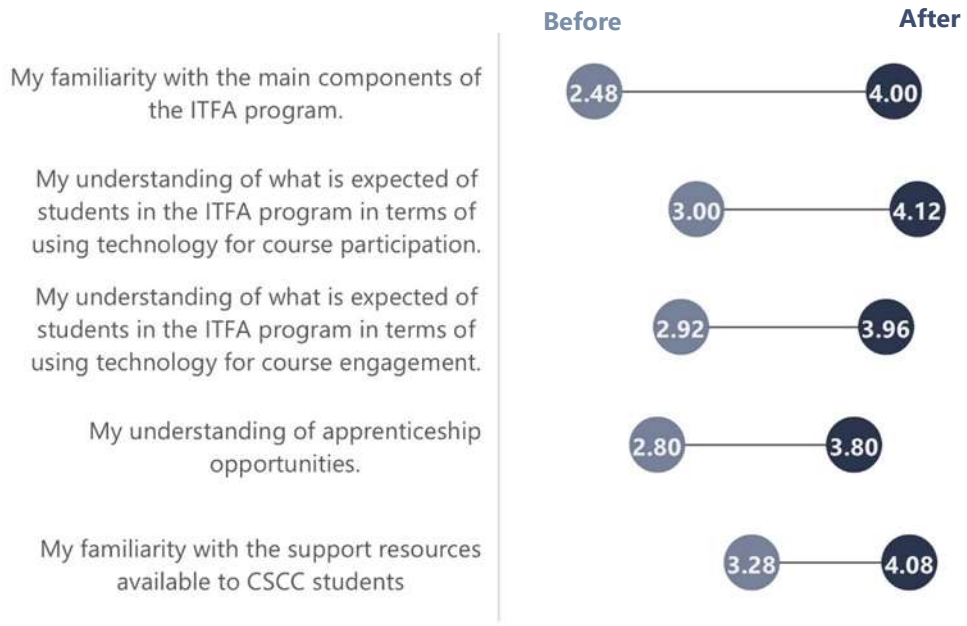


Figure 20. Mean participant responses to the question, "Please select how you would have rated yourself on each item BEFORE today's program and now AFTER." The response scale was from 1 to 5 with 1=very low, 2=low, 3=medium, 4=high, 5=very high (n=27).

Advising Effectiveness

At Columbus State, academic advising was provided as needed with particular emphasis on assistance related to course selection and scheduling. Renewed attention to communication with students through texts as well as email prompting them to attend appointments and workshops has been effective.

Project team members noted that the 2020 cohort struggled this year as they seem exhausted from navigating transitions through the COVID-19 pandemic. Many of them received full-time offers midway through the academic year and lost touch with their role as a student as they tried to manage both work and school expectations, even skipping required program events because of work. Skipping program events can lead to students' inability to achieve career readiness and prepare for apprenticeship opportunities as a part of their educational credential. The project team stated that they must work to help employers understand the return on investment if students can follow and completed the program as designed.

Career Readiness Effectiveness

Career readiness includes satisfactory academic course success and completion of a resume review and a satisfactory mock interview with advisors. Students that meet this milestone are invited to participate in networking and interviewing events with employers. Of the 2021 cohort, 56 of 93 students (60%) achieved career readiness.

Over the course of the spring semester, students can participate in several workshops and events to address career development knowledge and job placement skills. Students found the Resume Writing (87%), Interview Skills (87%), and Networking and Linked In (82%) workshops to be the most helpful (Figure 21).

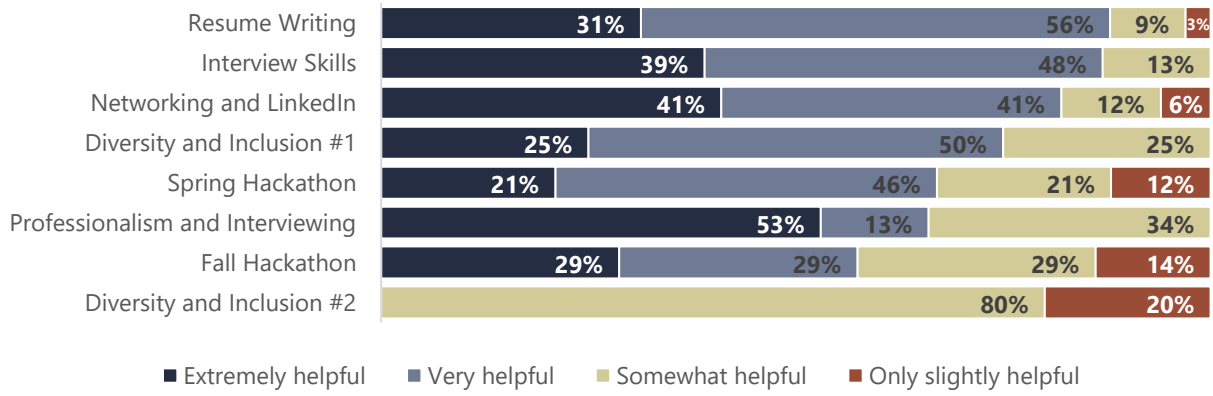


Figure 21. Student ratings of helpfulness of career readiness workshops.

Post-event survey respondents noted that general resume advice, information on the STAR (situation, task, action, result) interview method, and LinkedIn etiquette were among the most helpful aspects of these workshops. As one former apprentice noted, *"career readiness services was an excellent warm up for interviews…they helped quite a bit at learning to talk about myself, my projects, my successes, my failures, and why I need to be hired."*

Student knowledge gains varied across workshops, with no clear patterns, although many of the items with negative pre/post scores relate to interviewing (Figure 22).

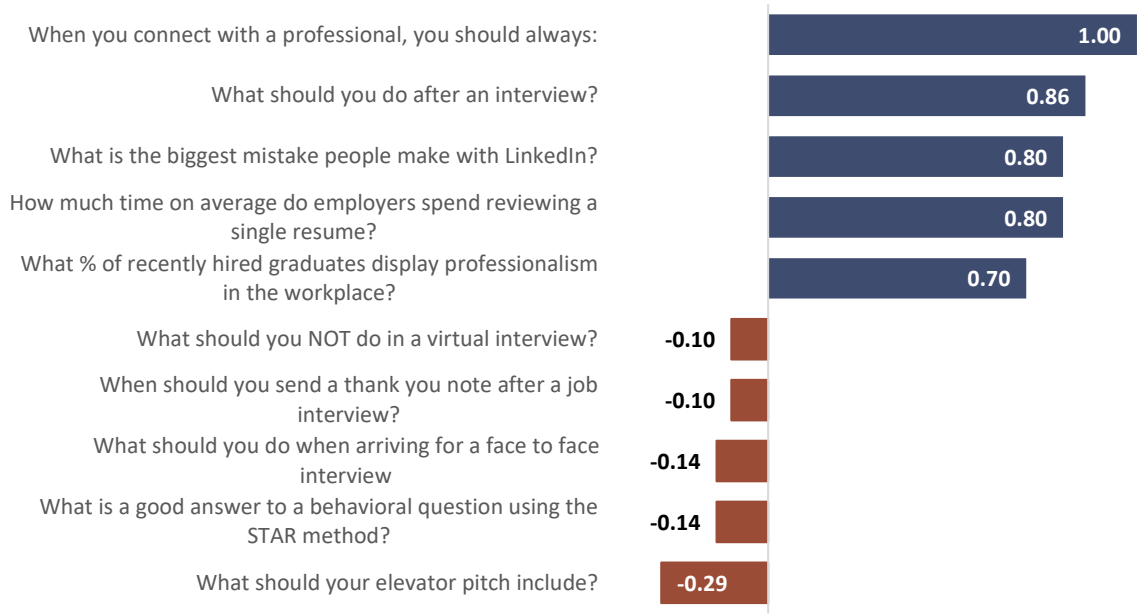


Figure 22. Top and bottom five topics of career readiness knowledge gain.

Students who completed their apprenticeship were asked about the extent to which they believed that their coursework at Columbus State had prepared them for their position. Nearly all indicated that they felt mostly prepared (Figure 23), with respondents noting that their networking classes, knowledge of Excel, programming course, labs, and hands-on projects were particularly helpful.

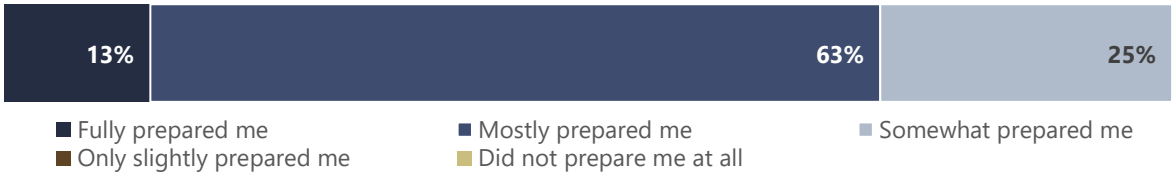


Figure 23. Perceived level of preparedness for apprenticeship.

Persistence and Completion

Persistence and completion are defined by three program benchmarks: 1) career readiness – including academic course success, an approved resume, and a successful mock interview; 2) apprenticeship interviews; and 3) apprenticeship offers/placement. Students who do not complete this cycle may leave the program or return to join the next cohort. Compared to 2019 (n=82) and 2020 (n=59), the 2021 cohort achieved higher rates of interviews and offers, although initial career readiness rates are slightly lower than 2019 and 2020 (Figure 24).

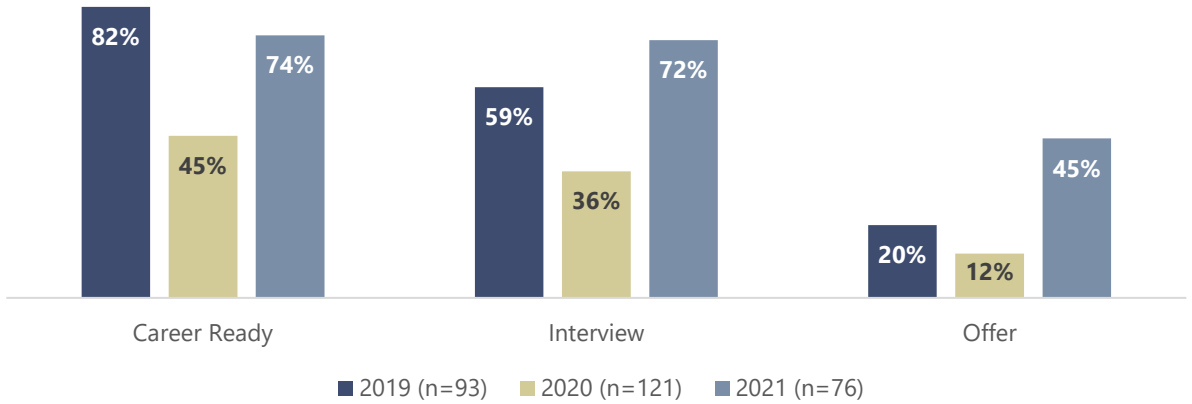


Figure 24. Percentage of starting cohort that reached each program benchmark.

Nearly three-quarters of the original 2021 cohort achieved career readiness (n=56) and all of those students received at least one interview[3] with 33 receiving an offer. When comparing the cohorts of students who achieved career readiness, there is a steady increase in the percentage of students who receive interviews and offer achievement (see Figure 25).

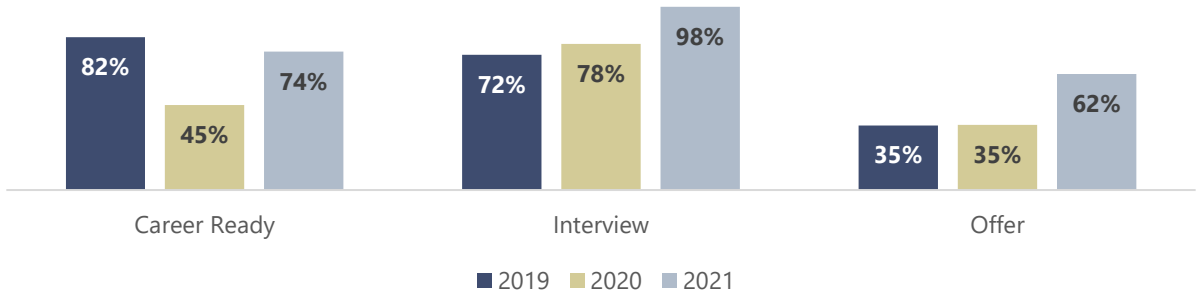


Figure 25. Percentage of "career-ready" participants reaching subsequent stages.

As course success – defined as a grade of 'C' or better – is a component of career readiness, analyses were completed to understand the potential role of academics in career readiness of program participants. Overall, when compared to non-program students, ITFA participants are achieving course success at a higher rate than other students in the IST department (Figure 26).

[3] One Career READY student secured an internship prior to interviews and was excluded from the interview process.

Figure 26. Comparison of course success rates.

When considering under-represented populations in IT, those differences remain, with ITFA program participants outperforming other IST department students when compared by gender (Figure 27) and by race/ethnicity (Figure 28).

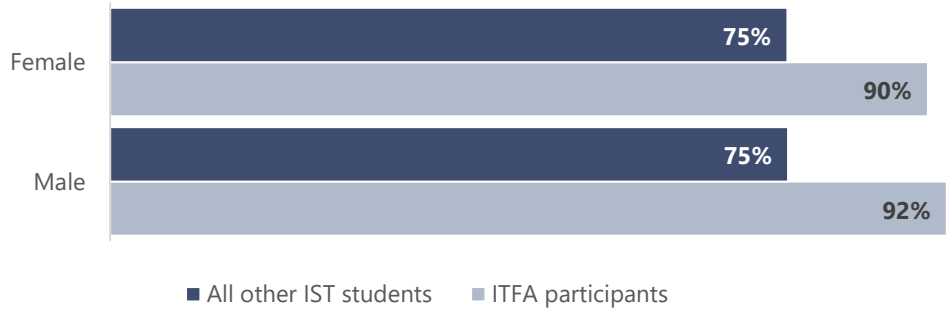


Figure 27. Course success rates by gender and program participation.

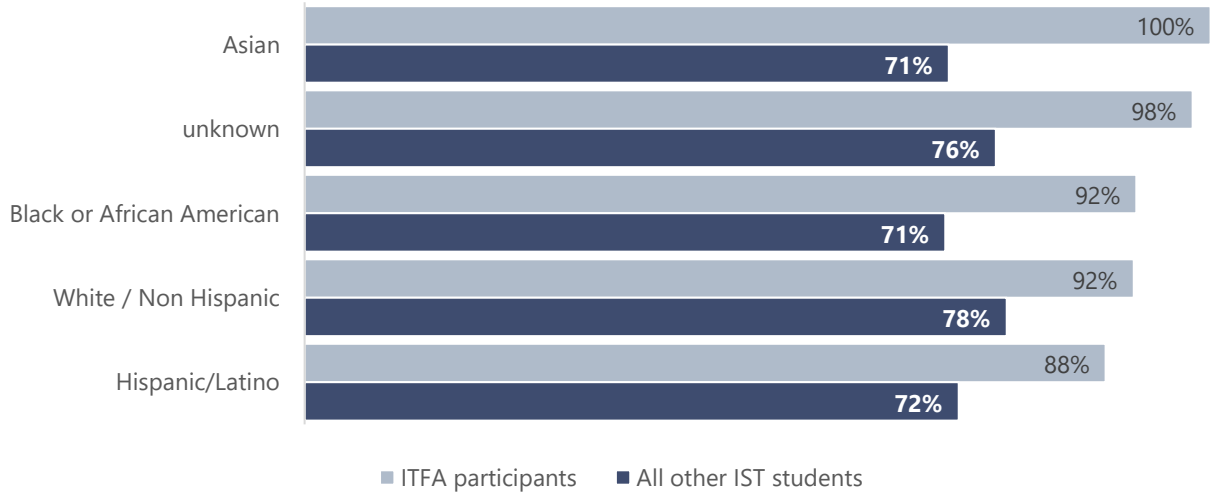


Figure 28. Course success rates by race/ethnicity and program participation.

There are slight variations in course success among ITFA participants, particularly when looking comparisons by race/ethnicity. In particular, Black/African American students and their White peers achieve course success at the same rate. However, as discussed earlier, Black and African American students achieve career readiness and apprenticeship placement at a lower rate. These data suggest that the ITFA program at Columbus State is effective at achieving high levels of course success overall compared to the general IST student population, but there are disparities by race and gender in progressing through career readiness to apprenticeship placement.

As of March 2022, 35 students have completed an apprenticeship (Figure 29). Thirty-four participants have completed both the apprenticeship program and received their degree or credential.

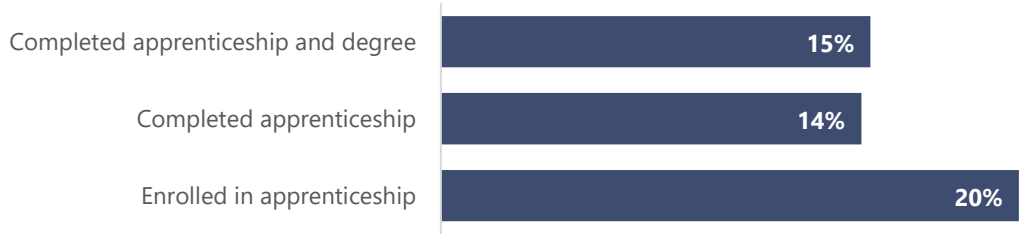


Figure 29. Progress towards completion goals.

Nearly 60% of apprentices have completed their workplace-based experiences and half have also completed their degree (Figure 30).

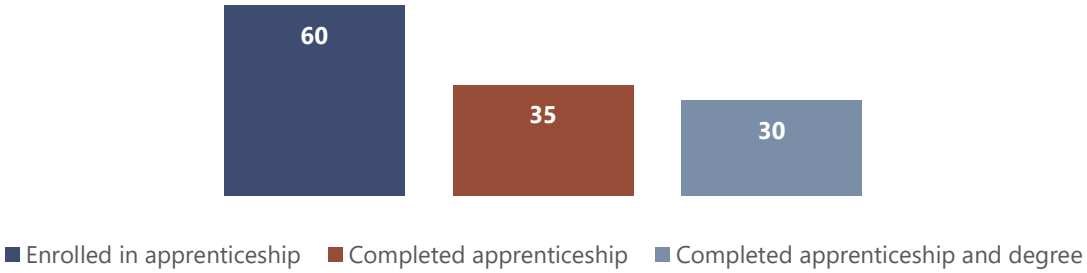


Figure 30. Progress from apprenticeship to degree completion.

These findings suggest that there are barriers preventing program participants from completing their apprenticeship experiences.

Conclusions

Participants continue to view orientation, advising, and career readiness activities as effective. Findings suggest that knowledge gain related to job placement varies, with some indications that interview skills may be a weaker area. However, employers and apprentices both perceive that they are generally well-prepared for their apprenticeship experiences. Just over half of students complete their apprenticeships, but fewer also complete their degree.

Evaluative Question #4: Overall, what differences are the programs of study having on student outcomes?

Achieving career readiness and obtaining an apprenticeship are both steps to the goal of full-time employment. Among Columbus State's 2019 cohort, 19 of 20 (95%) completed their apprenticeships and 12 (63%) were

converted to full-time employment with their apprenticeship employer. At the end of Year 3, 26 apprentices have been hired by employer partners.

Employer and apprentice feedback was gathered in Fall 2021 to assess apprentice performance and satisfaction with the experience. Employers reported that the apprentices that they hired had the skills and knowledge needed (Figure 31).

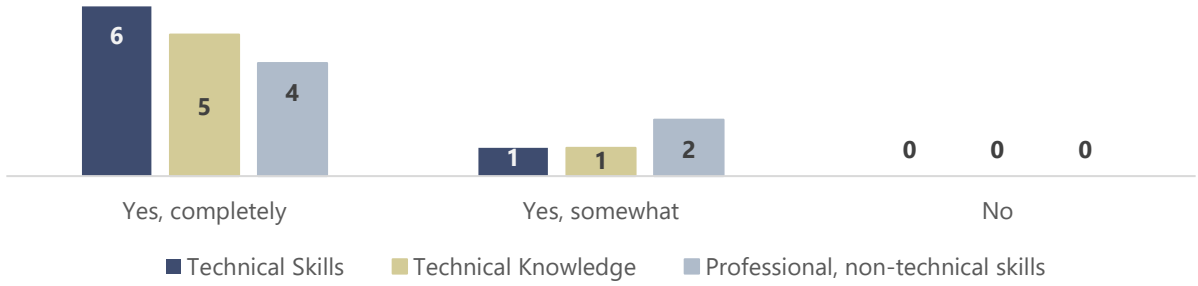


Figure 30. Employer perceptions of apprentices' skills and knowledge.

Both apprentices and employers found the experience to be very valuable (Figure 31). Employer respondents noted that this value came from the ability to develop apprentices' skills to meet operational needs and to convert an apprentice to a full-time role.

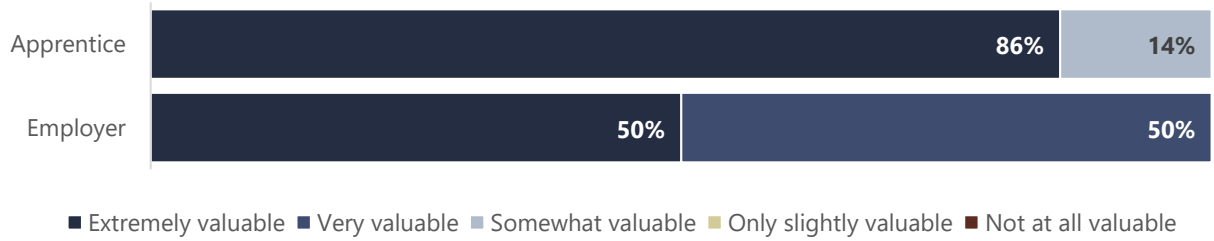


Figure 31. Perceived value of apprenticeship.

Most apprentices reported that the mentoring that received while on the job was excellent, noting that their supervisors and colleagues were available and supportive (Figure 32). Nearly all reported that they also had additional learning and development opportunities, such as obtaining certifications, tuition assistance, networking with other apprentices.

Figure 32. Apprentice perceptions of mentoring quality.

Conclusions

Over half of students who complete an apprenticeship are converting to full-time employment. Both employers and apprentices express high levels of satisfaction with the apprenticeship experience.

Evaluative Question #5: How effective is teacher recruitment? To what extent are teachers making pedagogical changes based on professional development educational opportunities?

After enrolling one individual in the UC training program in Year 2, teacher recruitment has stalled in Year 3, the second year of this initiative. The UC program's 18 self-paced modules are intended to prepare teachers to serve as CCP instructors based in school districts to expand access to IT career pathways. As of this report, there will be no second cohort for 2022-23, due to a lack of interest from school districts perhaps related to the limitations of and recovery from the pandemic. The project team is currently considering other options for these scholarship funds. After completing the modules, the first teacher participant shared his reflections on the credential process and the experience of program implementation in his school district (see interview protocol in Appendix N).

Credential Process

The first cohort was comprised of a single participant who completed both the modules and an intensive pedagogy institute to gain his teaching license between May and December 2021. As a member of the district's IT staff, he was not previously licensed but agreed to participate due to his IT knowledge and interest in supporting students. He believed that the program content was well-aligned between the topical and teaching-oriented courses and that all the modules were relevant to the classes he would teach.

After his credentialing experience, he reflected that is not realistic to complete the require 18 modules in three months (i.e., May to August) which was the schedule communicated to him and likely intended to reflect a secondary school teacher's time away from the classroom for summer. He shared that, by September, the course instructors stated that module grades would be delayed as they shifted their attention to fall term classes. He described these aspects of the schedule as a "false deadline" that creates undue stress. For the future, he recommended that find an interested already-licensed teacher or provide ample time to complete licensure before starting the IT modules, ideally a full calendar year.

Support from his district was minimal, including minimal time to study during the workday so that most studying was completed during evenings and weekends. He noted that he had to repeatedly communicate to the district administration how difficult it was to complete graduate-level courses saying that *"It would be really helpful if all of the people involved in the program understands the depth and scope of what is being asked and understands what support is needed for the teacher candidate."*

Furthermore, he found that there was little personal or professional benefit in gaining the IT credentials as none of the credits are applicable for a Master's degree and there was no increase in salary. As he noted, *"To ask even a teacher who is already licensed to take their evenings and weekends to take on 18 graduate credits for no pay increase is a lot."*

Program Implementation

While completing the modules during Fall 2021, the participant was able to teach CSCI 1101 based on his previous credentials. Once he completed the UC modules, he still had to apply for permission to teach CSCI 1103 and did not have access to the course to prepare to teach it in Spring 2022.

Several impediments in his school district created additional difficulties, including a new administration that was not aware of the plan for his role and a lack of CCP infrastructure that has delayed or inhibited his ability to fulfill his role as intended. There was not a process or infrastructure in the district to accommodate the addition of this role. He described the district as still trying "to determine how to make it an actual pathway from the middle school to the high school. Right now, it is disjointed." Students were not able to choose the CSCI classes; instead, students with a 3.0 were selected regardless of their interest in the IT field and half of the students dropped the class. As a new teacher, he is limited in terms of what he can push through both "politically" as well as having time to do so. During the application process, the implementation of this project sounded feasible but the reality of a teacher without office hours to do the program planning and thinking, outreach, marketing, and benchmarking is not realistic. District administration seems to believe it is his responsibility to make the program successful, but it is unclear how that is possible because these missing administrative pieces.

The candidate advises that a grant representative should learn more about what the district envisions and benchmark how this process is done well in other districts to make sure that the pipeline is successful. These findings should be shared with principals and a district's director of secondary education to put together a plan that they can commit seven to ten years to benchmark student success in the program. Further, there should be at least a half-time program director for CCP who could coordinate program planning and marketing to the right students.

This individual remains engaged in the program and is still leading the new IT Pathways program in his district. He has sought opportunities to connect his students to Columbus State through a campus visit and recommends that Columbus State regularly include a field trip for the students in these classes.

Conclusions

The first cohort of the teacher preparation program highlighted some crucial lessons about ideal candidates, communication, and district readiness. A second cohort has not been identified, and the project team is considering other options for these scholarship funds.

Evaluative Question #6: How has the project and related findings been disseminated and adapted by other institutions?

As in previous years, the project team has been active presenters at conferences (see Appendix N for session descriptions). These dissemination opportunities provided a platform for the project team to share their process and lessons learned around their career readiness activities, the new gamification initiative, creating co-curricular programming, and employer engagement. In addition, project members also presented on earn-and-learn models at the Success Bound Ohio conference and the gamification initiative was shared at career services conferences, including the Midwest Association of Colleges and Employers and the Ohio Cooperative Education

Association. Most recently, project team members from both colleges partnered to present a session on building a diverse talent pipeline through community college workforce engagement at the National Association of Colleges and Employers (NACE) conference.

As noted earlier, adaptation at Marion Technical College (MTC) has been limited as they are still in the early stages of implementation due to PI turnover and limited capacity. The MTC PI regularly participates in monthly project team meetings, but otherwise has limited communication with the Columbus State team. In Year 3, he has focused on building partnerships in the IT space within the constraints of their rural location and limited opportunities and increasing communication with industry partners. He is currently considering how to add co-curricular components, including a Hackathon and National Cyber Leagues in Year 4 and will work with the MTC experiential learning coordinator and director of career services on expanding opportunities.

Conclusions

The project team continues to be engaged in numerous dissemination efforts with frequent conference presentations to share their lessons learned on a variety of project areas. Adaptation at MTC has been limited in Year 3, but a new PI has begun to consider possible additions to their program.

SUMMARY AND RECOMMENDATIONS

In Year 3, the project team continued and refined their recruitment, orientation, career readiness, employer engagement, CCP pathway, and expansion activities. Notable achievements include improvements to the advisory model, introduction of a gamification mentoring initiative, and expanded employer engagement. The project team continued to successfully navigate the virtual environment, but personnel changes, limited teacher interest, and nascent adaptation at MTC were challenges.

Recruitment efforts continue to attract an applicant pool that results in solid program enrollment. Program participants are primarily female and White, with young adults comprising a large percentage of the population. While gender demographics reflect the program's success enrolling females as an historically under-represented population in the IT field, disparities remain in apprenticeship selection, with Black or African American students disproportionately under-represented in offers received. While employers report that fewer than 70% of students they interviewed possess the technical skills and knowledge for the position, both employers and students are satisfied with the apprenticeship selection process, which resulted in 33 placements in Year 3. Program participants continue to view orientation, advising, and career readiness activities as effective. Findings suggest that knowledge gain related to job placement varies, with some indications that interview skills may be a weaker area. Over half of students who complete an apprenticeship are converting to full-time employment. Both employers and apprentices express high levels of satisfaction with the apprenticeship experience. Just over half of students complete their apprenticeships, but fewer also complete their degree.

The project team continues to be engaged in numerous dissemination efforts with frequent conference presentations to share their lessons learned on a variety of project areas. Adaptation at MTC has been limited in Year 3, but a new PI has begun to consider possible additions to their program.

The first cohort of the teacher preparation program highlighted some crucial lessons about ideal candidates, communication, and district readiness. A second cohort has not been identified, and the project team is considering other options for these scholarship funds.

As the project team transitions to a no-cost extension (NCE), the following recommendations are provided.

1. Students and employers express satisfaction with their preparation and the apprenticeship experience, but the evaluation findings presented point to continued disparities in career readiness and a considerable number of apprentices who do not complete their workplace-based experience. While the rates of interview invitations and apprenticeship offers have risen in the last year, the project team must work to understand the barriers that students, particularly Black/African American populations, face both at Columbus State and in their interactions with employers, as well as to identify the disparities in who completes the ITFA program.

2. Teacher recruitment stalled in Year 3, and feedback from the first cohort provides some areas that could improve participation in this initiative. First, identify the necessary criteria for this initiative to be operationalized within district structures and consider how the project team representative can provide guidance on a district's CCP processes to achieve effective student recruitment and placement in appropriate courses. Second, engage with districts and with CCP staff to understand the extent to which districts can meet those criteria and the support they need from Columbus State.

3. As MTC continues to work to adapt the model to their institution, the Columbus State team should engage the PI to identify communication and collaboration needs to support implementation. In particular, regular one-on-one conversations outside of project team meetings would help to identify how MTC can learn from Columbus State's experience and how grant funds might be used to increase capacity. In addition, the MTC project team should consider how they might leverage the shift toward virtual roles within in IT to mitigate the scarcity of similar roles within their rural environment.

Appendix A – Author Biographies

Kathleen Lis Dean, Ph.D., provides clients with insights from her extensive experience helping organizations connect strategy, evaluation, and learning for program improvement and impact. Prior to joining The Rucks Group, she spent 20 years in evaluation and strategic leadership roles at higher education, nonprofit, and philanthropic organizations. In these roles, she leveraged qualitative and quantitative data to support organizational effectiveness, outcomes assessment, accreditation, strategic planning, and continuous improvement. Dr. Dean utilizes a collaborative approach in her work. She also draws on her research about boundary-spanning teams, strategic thinking, and organizational learning to incorporate multiple perspectives and intentional practices to help clients achieve their goals. Dr. Dean earned a Ph.D. in higher education policy and leadership at the University of Maryland, and both a master's degree in education and a bachelor's degree in international relations at the University of Delaware.

Julia Siwierka, Ph.D., joined The Rucks Group in 2019. Dr. Siwierka's educational preparation focused on applied research methods within real-world broader systems and organizational settings. Dr. Siwierka has served as the evaluator for the Boys & Girls Clubs of South Central Kansas, assessing program impact for multiple sites and managing data collection efforts. She also worked on Kansas's System of Care evaluation funded by the U.S. Department of Health and Human Services' Substance Abuse and Mental Health Services Administration. She is a member of the Society for Community Research in Action, AEA and OPEG. Dr. Siwierka earned a doctorate in community psychology at Wichita State University.

Appendix B – Logic Model

INPUTS	ACTIVITIES	OUTPUTS	SHORT-TERM OUTCOMES	INTERMEDIATE OUTCOMES	LONG-TERM OUTCOMES
Columbus State Community College Manufacturing Work Study model Industry Leadership Team (ILT) University of Cincinnati Local employers Local high schools and teachers	Regular project team and evaluation meetings Adaptation of Apprenticeship program for IT students Recruitment events and marketing for IT Apprenticeship Academic supports, i.e., advising and workshops OJT and mentoring provided by employers Continuous curriculum engagement and feedback from ILT Development of IT foundational courses for high school CCP courses Graduate-level training to	Outreach and recruitment plan created 105 CSCC IT students served Students receive industry-aligned credentials 120 high school students served by Summer Institute and enroll in CCP IT classes 7 high school teachers become credentialed Technical guide created for replication	High satisfaction among attendees at recruitment events Increased interest in IT occupations Increased awareness of IT occupations Increased student retention/persistence High satisfaction among students in IT Apprenticeship program, including academic advising and supports High satisfaction among employers with:	Continued high satisfaction among attendees at recruitment events Increased enrollment in IT Apprenticeship program High satisfaction among apprentices with: - Apprenticeship experience - Employer mentors Apprentices are prepared for the IT workforce in: - Soft skills - Technical knowledge High percentage of apprentices employed Increased degree completion rates Increased apprenticeship completion rates	More skilled IT workforce at partner companies Larger pipeline for IT professionals in the region Proof of models' effectiveness for delivering apprenticeships Program replicability on national scale Local, regional, and national IT needs are addressed

Appendix C – Status of Project Activities

Major Implementation Project Activities for Year 3	Anticipated Status	Actual Status
Create template articulation with a four-year IT Program	Completed	Completed
Transition foundational associate degree courses into College Credit Plus	Completed	Ongoing
Provide competency-based graduate modules to credential second cohort of high school teachers to teach College Credit Plus dual credit IT courses	Completed	On hold
Partner with high schools to prepare dual credit students for work readiness.	Completed (recurring)	Development (recurring)
Second cohort of students begin work experience.	Completed	Completed
Second cohort of students graduate	Completed	Completed
Identify best practices to adapt model.	Operation (ongoing)	Operation (ongoing)
Replicate model and prepare initial pilot of adapted work study at Marion Technical College	Ongoing	Ongoing
Project dissemination	Ongoing	Ongoing

Appendix D – Project Team Interview Protocol

IMPLEMENTATION	• What were your responsibilities as part of the grant this year? • What were the main project activities in Year 3 (e.g., recruitment, orientation, career readiness, employer engagement, replication, dissemination, etc.) • What has been most successful this year? • What challenges have emerged this year? (follow up: if resolved, how?) • (for faculty): What was your involvement in the KSA process (BILT)? What influence has this had on the curriculum? • Who has been a key player in the grant this year? • What challenges and opportunities do you foresee in Year 4 (NCE)?
EMPLOYER ENGAGEMENT	• How have partners been involved/engaged in this project? • Follow-up: How have you engaged with industry to gather and incorporate their feedback this year? • Follow-up: How do you plan to engage with industry to gather information going forward? • What challenges and successes emerged in Year 3 around employer engagement? • What employer expansion efforts have CSCC and/or MTC undertaken?
RECRUITMENT AND SELECTION	• What did recruitment look like in Year 3? • What challenges has recruitment experienced in Year 3? • How has student diversity been addressed/changed in the recruitment process? • What are the most important factors in selecting pre-apprentices?
ONBOARING AND RETENTION	• How are students oriented/onboarded to the program? • What do you see as most successful in this process? Most challenging? • What is involved in advising program participants? What changes to this process have occurred in Year 3? • What are the most common challenges that students face? • What resources do you connect students to? Student feedback? • How does the AWS Bootcamp support student success? • What is the impact of the cohort model? • What are any continuing effective of the COVID-19 pandemic on student retention?
REPLICATION AND DISSEMINATION	• What replication activities have occurred in Year 3? • What lessons has the project team learned with regard to replication/adaptation? What do you see as best practices? What dissemination activities has the project team engaged in (e.g., conference presentations, publications)
STUDENT OUTCOMES	• How have professional skills for CCP students been incorporated into the program? • To what extent have ITFA students participated in extracurricular activities, like Cyber Meet-ups, Cyber Club, National Cyber League, and Hackathons? How do students benefit from participating in these experiences?
TEACHER RECRUITMENT	• What is the status of the University of Cincinnati graduate modules for a second cohort of high school teachers? • Follow-up: What feedback, if any, have you heard from the districts? • What challenges and successes has the program experienced in recruiting teachers?

Appendix E – IT Night Agenda

Wednesday, Oct. 27, 2021 | 6:00pm – 8:00pm
Columbus State Community College

5:30-6:00 p.m. **Virtual Check-In** (Microsoft Teams/LiveStream)

6:00-6:05 p.m. **Virtual Welcome & Overview** (LiveStream)

6:05-6:10 p.m. **Virtual Admissions College Overview** (LiveStream)
Justin Grote, Director
Office of Admissions, Columbus State Community College

6:10-6:20 p.m. **Virtual Work-Study Program Overview** (LiveStream)
Thomas Capps, Program Manager
Kaylor Ramey, Program Coordinator
Employer Engagement & Experiential Learning, Columbus State Community College

6:25-6:55 p.m. **Virtual Industry & Student Experience Panel** (LiveStream)

Moderator		
TBD	TBD	TBD

Employer Panelists		
NAME GOES HERE	TITLE GOES HERE	COMPANY GOES HERE
NAME GOES HERE	TITLE GOES HERE	COMPANY GOES HERE
NAME GOES HERE	TITLE GOES HERE	COMPANY GOES HERE
NAME GOES HERE	TITLE GOES HERE	COMPANY GOES HERE
NAME GOES HERE	TITLE GOES HERE	COMPANY GOES HERE

Current & Alumni Program Participant Panelists			
STUDENT NAME	PROGRAM STATUS	TITLE	COMPANY
STUDENT NAME	PROGRAM STATUS	TITLE	COMPANY
STUDENT NAME	PROGRAM STATUS	TITLE	COMPANY
STUDENT NAME	PROGRAM STATUS	TITLE	COMPANY

7:00-7:20 p.m. **Virtual Break-Out Session #1**
Groups Split at Registration (Group A & Group B)

SESSION NAME GOES HERE	Presenter	Description	Virtual Location
	TBD	TBD	Hyperlink: TBD Zoom

7:25-7:45 p.m. **Virtual Break-Out Session #2**

We'll Be Right Back Visual Needed for Kyle & Ben

	Presenters	Description	Virtual Location
A Deeper Dive into the IT Flexible Apprenticeship	TBD	TBD	Hyperlink:

7:50-8:00 p.m. **Virtual Application Assistance Workshops**

Application	Description	Virtual Location
Admissions	Apply to the College	Hyperlink:
ITFA Program	Apply to the Program	Hyperlink:

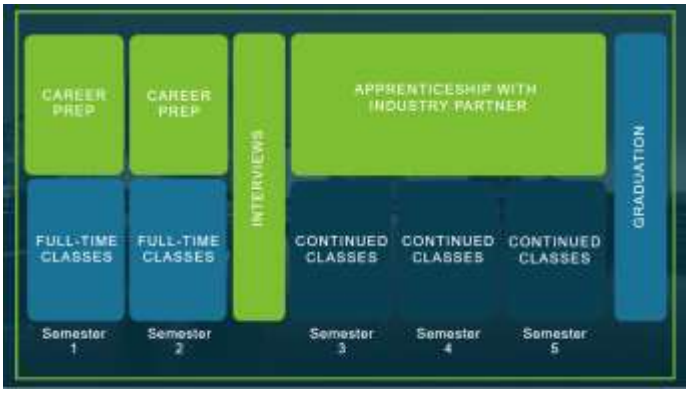
Virtual Resource & Employer Fair (Microsoft Sway)

Virtual Resource Fair Access Link
Hyperlink: SWAY

Appendix F –ITFA Onboarding Workshop Slides


Designing developing, implementing, and maintaining defensive and offensive cyber strategies
CYBER SECURITY
SOFTWARE DEVELOPER
Computer languages
Networking
Web development fundamentals
Software development methodology
Business courses and soft skills required for success in a modern corporate environment.


Minimum Program Requirements
• 2.0 GPA
• College Ready (Placement into English 1100 and Math 1050 +)
• Majoring in Software Development, Cyber Security, or DCT Certificate
• C or better in required courses
If you fall below program requirements, you'll get an email letting you know you've been removed from the cohort – BUT there is a possibility you could return to the program in the next cohort by improving your GPA or retaking courses for better grades.

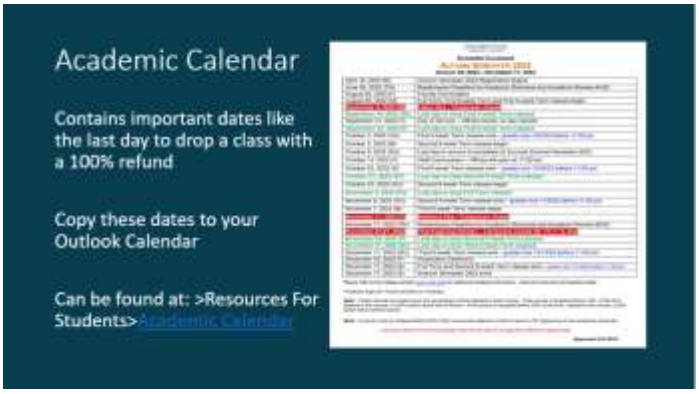

CAREER PREP
CAREER PREP
INTERVIEWS
APPRENTICESHIP WITH INDUSTRY PARTNER
GRADUATION
FULL-TIME CLASSES
FULL-TIME CLASSES
CONTINUED CLASSES
CONTINUED CLASSES
CONTINUED CLASSES
Semester 1
Semester 2
Semester 3
Semester 4
Semester 5


Program Timeline
• Autumn 2022
• Required Courses and Pre-requisites
• Employer Spotlights/DEI Workshop
• IT Gamification Mentorship
• Spring 2023
• Required Courses and Pre-requisites
• Career Ready Workshops
• Interviews with Employer Partners (in May)
• Summer 2023
• General Ed courses
• Some apprenticeships begin in July
• Autumn 2023
• Advanced courses and General Ed courses
• Apprenticeships
• Spring 2024
• Advanced courses and General Ed courses
• Apprenticeships
• May 2024
• Graduation
• (hopefully a full-time job offer)


OUR ITFA INDUSTRY PARTNERS
DIVERSE EMPLOYMENT. COMPETITIVE SELECTION.
rev1ventures
Ohio
GBQ
accenture
Huntington
Nationwide
STATE AUTO
HONDA

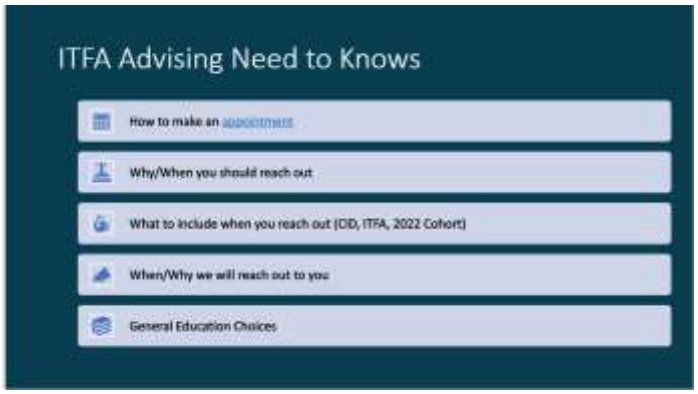

85%
Conversion to Full-Time Employment
$18
Apprentice Average Hourly Wage
55%
Students from Under-Represented Groups
$60k
Average Starting Salary
>15,000
Open Industry Positions in Ohio
WHY ITFA?


Save the Date for Orientation
JULY 21


Academic Calendar
Contains important dates like the last day to drop a class with a 100% refund
Copy these dates to your Outlook Calendar
Can be found at: >Resources For Students>Academic Calendar


Technology


Columbus State Self-Service
COLUMBUS STATE
www.cscc.edu

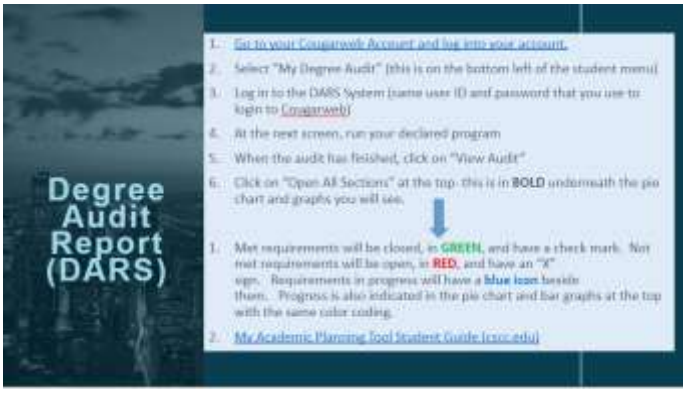

ITFA Advising Need to Knows
How to make an appointment
Why/When you should reach out
What to include when you reach out (OID, ITFA, 2022 Cohort)
When/Why we will reach out to you
General Education Choices


Financial Aid and Scholarships
Getting Started with Financial Aid
File the FAFSA
Apply for Scholarships
Complete Financial Aid steps in Self Service
Contact Student Central for Assistance (614-287-5353)
Email
Chat with
What We Can Help With
Check your award and answer general questions
Help with SAP appeals (advisor academic plans)


Choose Ohio Information Systems Technology Scholarship
Choose Ohio First Information Systems Technology (COF IST) is a scholarship opportunity for students to receive:
• Tuition assistance for courses within the targeted programs (9 awardees a year - $4592.00 total scholarship/academic year)
• Personalized advising & accountability with Program Coordinator
• Membership in a small cohort with which the student will progress through their plan of study
• Access to tutoring, Career Services, Disability Services and other student support services
APPLY HERE


Scholarships in STEM: Information Systems Technology (a National Science Foundation Scholarship Program)
The NSF S-STEM First Scholars is a scholarship opportunity for students to receive:
• Tuition assistance for courses within the targeted programs ($4775.00 total scholarship/academic year)
• Personalized advising & accountability with Program Coordinator
• Membership in a small cohort with which the student will progress through their plan of study
• Access to tutoring, Career Services, Disability Services and other student support services
APPLY HERE


Tuition and Fees
Semester Fee Structure
• Tuition is charged per credit hour.
• Always due the Wednesday before classes begin.
• If you have a balance on that day, you may be dropped from your classes!
• Other expenses can include lab fees & technology fees, and hidden costs like transportation, books and supplies.


Degree Audit Report (DARS)
1. Go to your Cougarweb Account and log into your account.
2. Select "My Degree Audit" (this is on the bottom left of the student menu)
3. Log in to the DARS System (same user ID and password that you use to login to Cougarweb)
4. At the next screen, run your declared program
5. When the audit has finished, click on "View Audit"
6. Click on "Open All Sections" at the top- this is in BOLD underneath the pie chart and graphs you will see.
1. Met requirements will be closed, in GREEN, and have a check mark. Not met requirements will be open, in RED, and have an "X" sign. Requirements in progress will have a blue icon beside them. Progress is also indicated in the pie chart and bar graphs at the top with the same color coding.
2. My Academic Planning Tool Student Guide (cscc.edu)


Tools to Build Your Plan
Course Schedule
Course Descriptions
Majors/Plans of Study
Degree Audit Reports (DARS)
Academic Advising
Websites


HOW TO REGISTER FOR CLASSES
COLUMBUS STATE


Landing Your First Job in the Field
It isn't solely about the degree. Finding your first job in the field might not be as easy as you think it should be. Being prepared is key.
Earn good grades in your courses at Columbus State but realize that learning the material is more important than the letter grade.
Earn an industry certification or two during your time in our department. There are many to choose from, but consider the AWS Cloud Practitioner, CompTIA A+ or Network+, or certifications from Microsoft or Oracle.
CREATE! BE A PRODUCER NOT JUST A CONSUMER OF TECHNOLOGY. Be able to demonstrate your work on a personal project—something you can take to an interview.
If you are a Web Design student you need an online portfolio. If you are a programming student your online portfolio is GitHub.
Develop your "soft" skills; these really are your employability skills.


COLUMBUS STATE
ITFA ORIENTATION
JULY 21, 2022
YOUR CAREER STARTS HERE

APPENDIX G – Cyber Meet-Up Post-Event Survey

March Cyber Meet-up

One student responded and one student partially responded to the March post-event survey.
One respondent reported increased knowledge and ability in all areas addressed by the program, particularly in creating an effective LinkedIn profile (Figure 1).

Figure 1. *Respondents' change in knowledge and ability for the March Cyber Meetup (n=1). Scale: 1= very low to 5=very high)*

Respondents indicated that they found the program's format to be **moderately** to **very** effective (Figure 2).

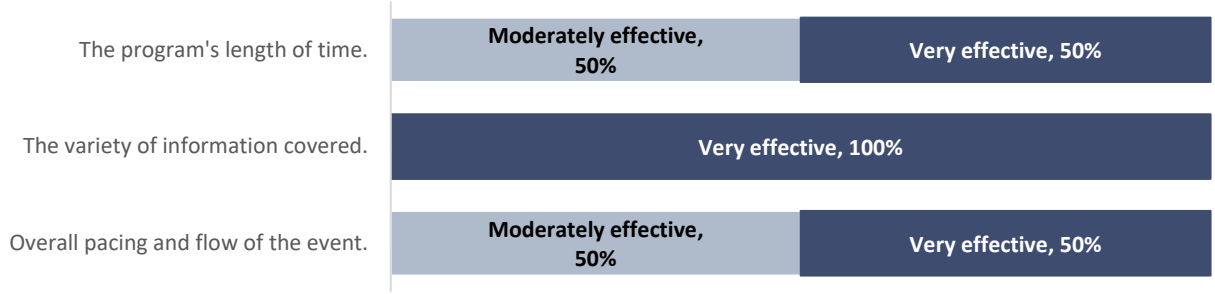


Figure 2. *Effectiveness of March program format (n=2).*

What participants found to be helpful:

- I really enjoyed hearing firsthand from people who went through the program. I also enjoyed the variety of certifications covered.
- The amount of information given about the certifications that those in Cybersecurity

Suggestions:

- Hearing about work experience as an apprentice vs. after being hired.
- The whole sharing screen thing was a bit of bump, since for a small while, the person who thought they were screensharing wasn't. Besides that though, nothing really!

should go for, as well as the variety of such information.

April Cyber Meet-up

Two students responded to the April post-event survey.

Both respondents reported increases in all areas addressed by the program, particularly in their knowledge of National Cyber Leagues (Figure 3).

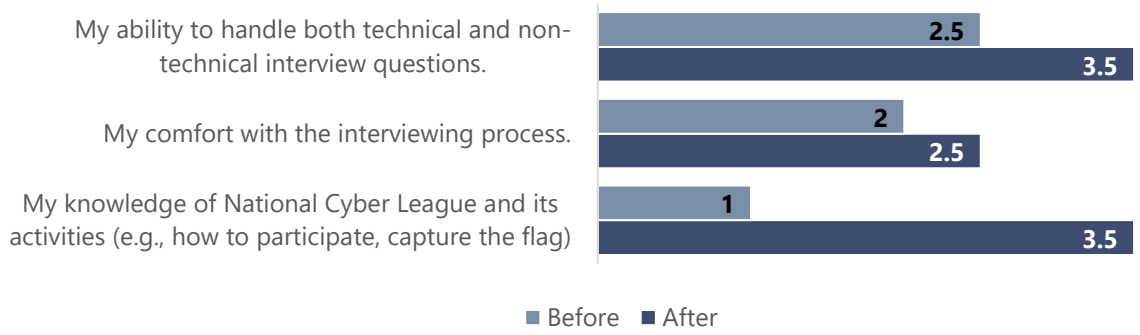


Figure 3. *Respondents' change in knowledge and ability for the April Cyber Meetup (n=2). Scale: 1= very low to 5=very high)*

Respondents indicated that they found the program's format to be mostly **very** effective (Figure 4).

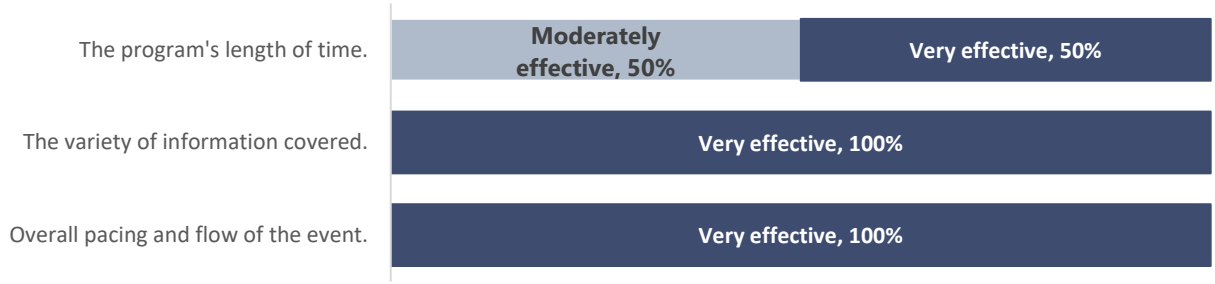
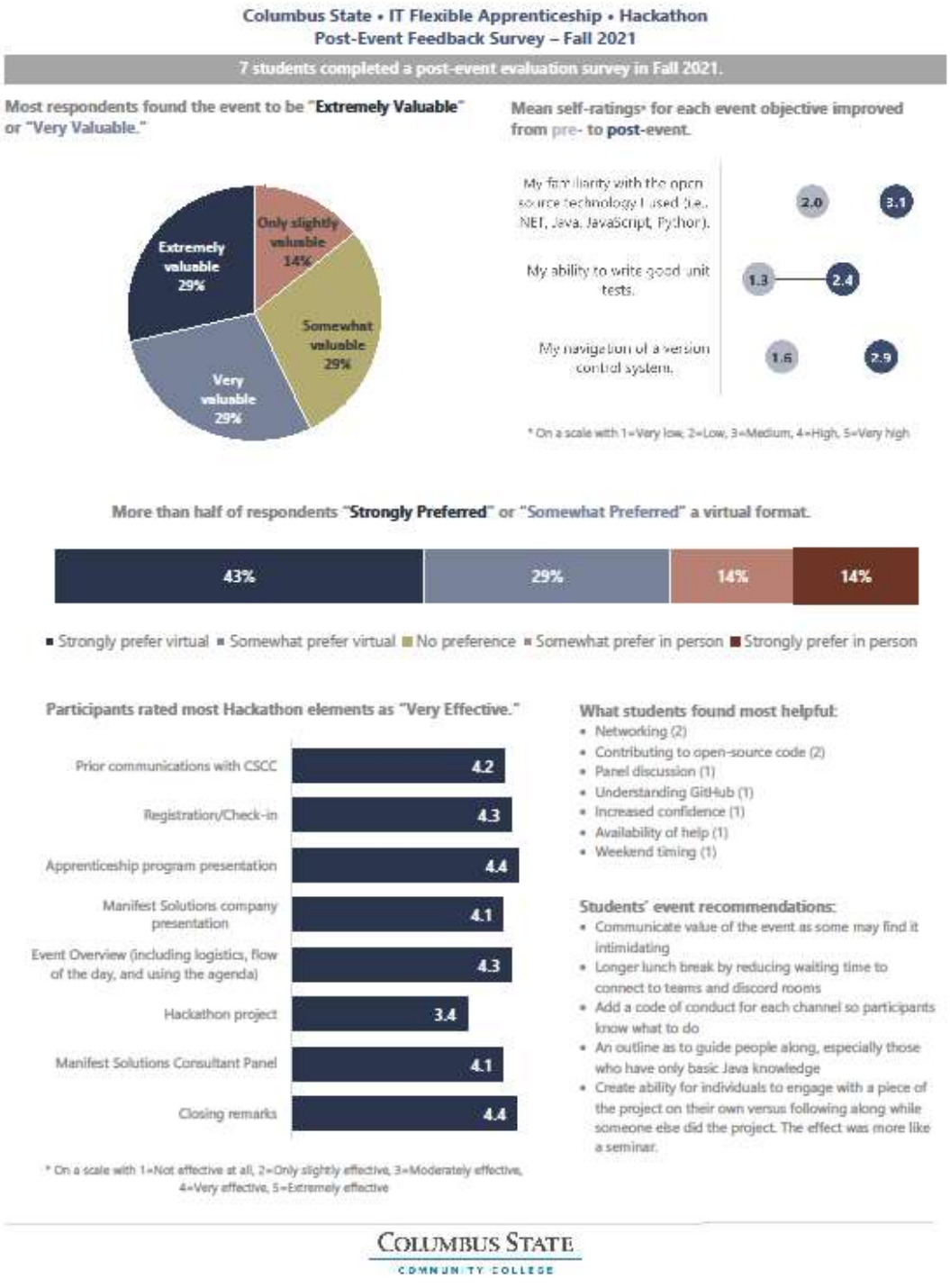


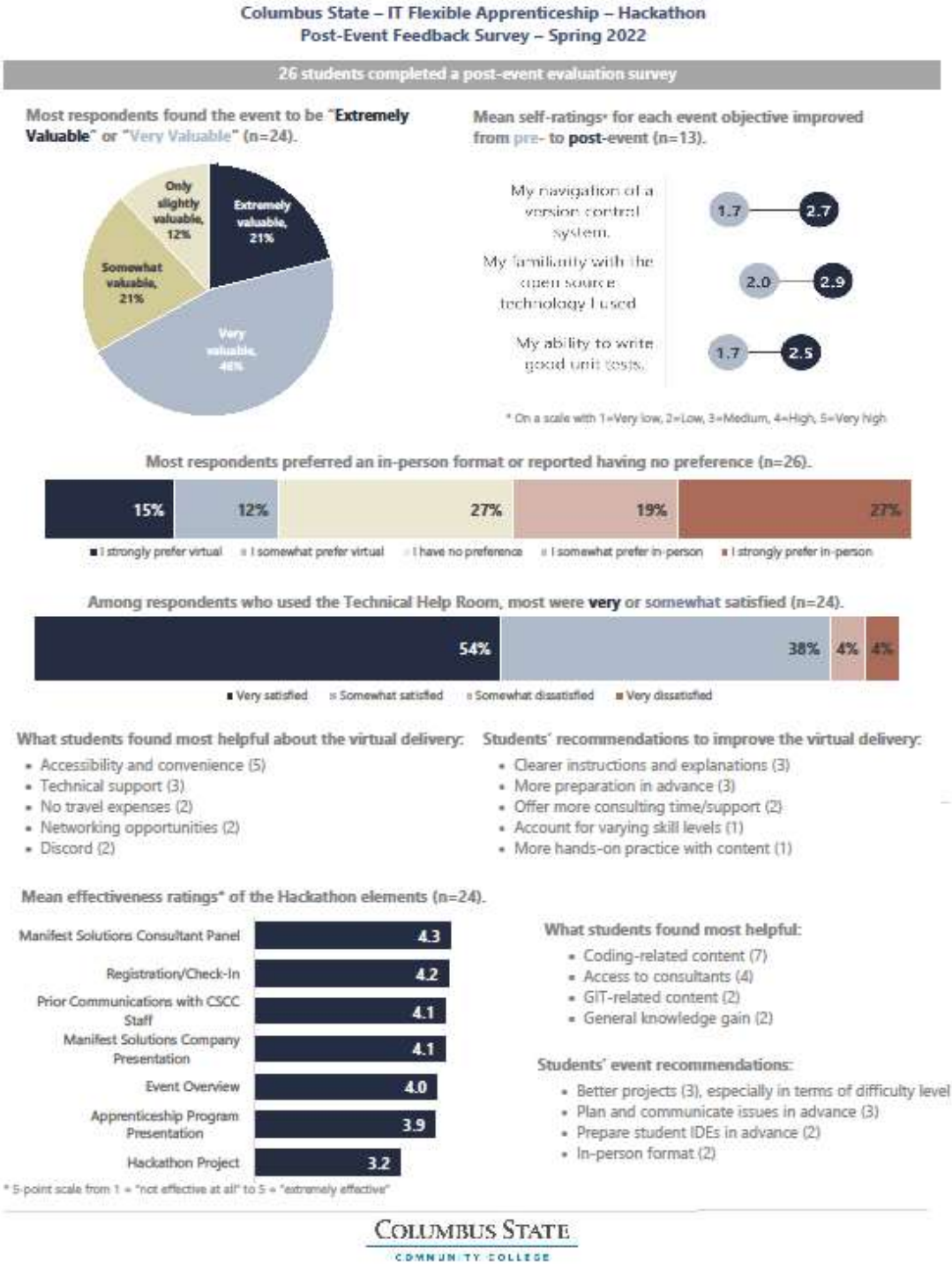
Figure 4. *Effectiveness of April program format (n=2).*

No student suggestions were provided from the April event.

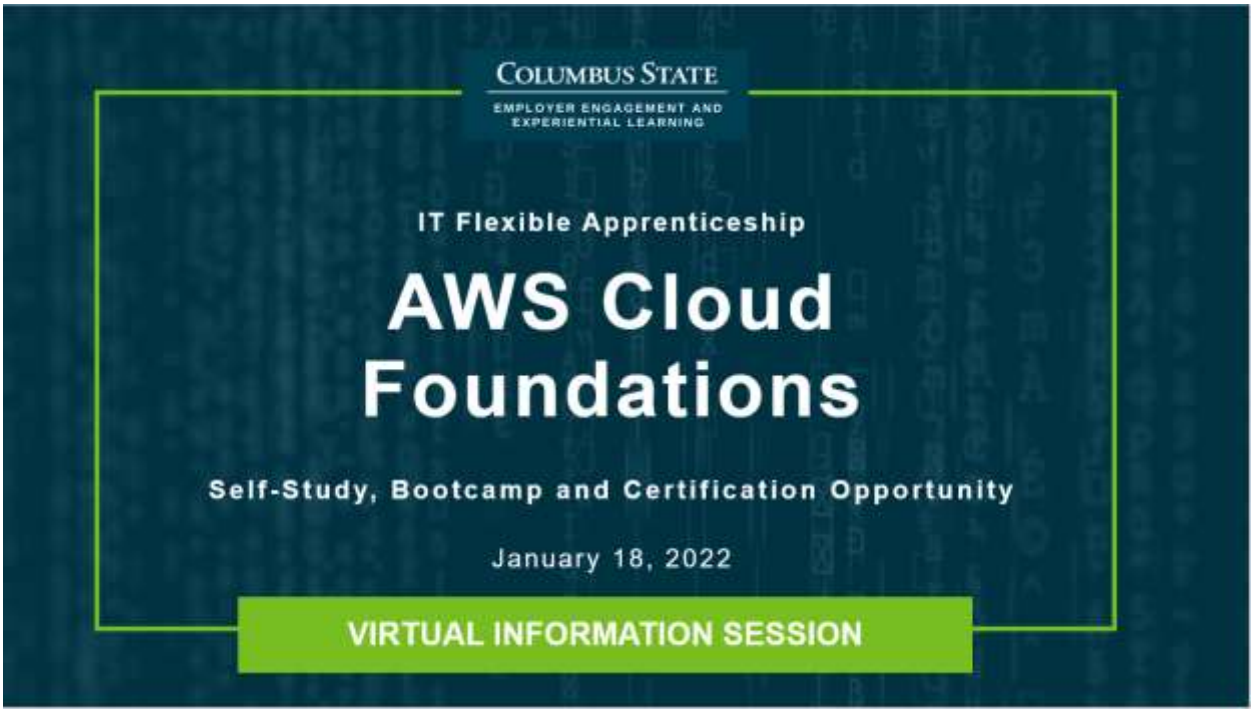
APPENDIX H – Fall Hackathon Survey Results



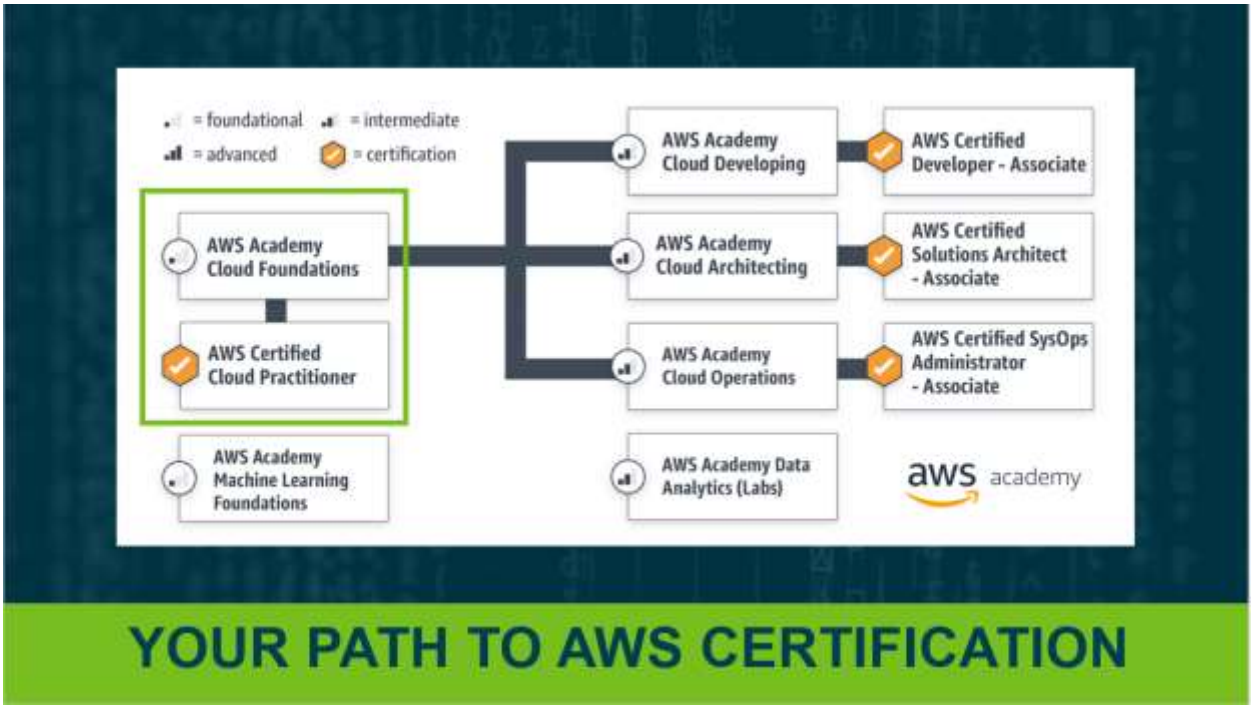
APPENDIX I – Spring Hackathon Survey Results



APPENDIX J – AWS Orientation Slides




COLUMBUS STATE
EMPLOYER ENGAGEMENT AND EXPERIENTIAL LEARNING
IT Flexible Apprenticeship
AWS Cloud Practitioner Certification:
A Benefit of ITFA
Presented by: Dave Cofer
VIRTUAL INFORMATION SESSION


= foundational
= intermediate
= advanced
= certification
AWS Academy Cloud Foundations
AWS Certified Cloud Practitioner
AWS Academy Machine Learning Foundations
AWS Academy Cloud Developing
AWS Academy Cloud Architecting
AWS Academy Cloud Operations
AWS Academy Data Analytics (Labs)
AWS Certified Developer - Associate
AWS Certified Solutions Architect - Associate
AWS Certified SysOps Administrator - Associate
aws academy
YOUR PATH TO AWS CERTIFICATION


COURSE MODULES
1. Cloud Concepts Overview
2. Cloud Economics & Billing
3. AWS Global Infrastructure
4. Cloud Security
5. Networking & Content Delivery
6. Compute
7. Storage
8. Databases
9. Cloud Architecture
10. Automatic Scaling & Monitoring
CLOUD FOUNDATIONS


COLUMBUS STATE
EMPLOYER ENGAGEMENT AND EXPERIENTIAL LEARNING
IT Flexible Apprenticeship
Faculty Perspective on AWS Training & Certification
Presented by: Mike Greer
VIRTUAL INFORMATION SESSION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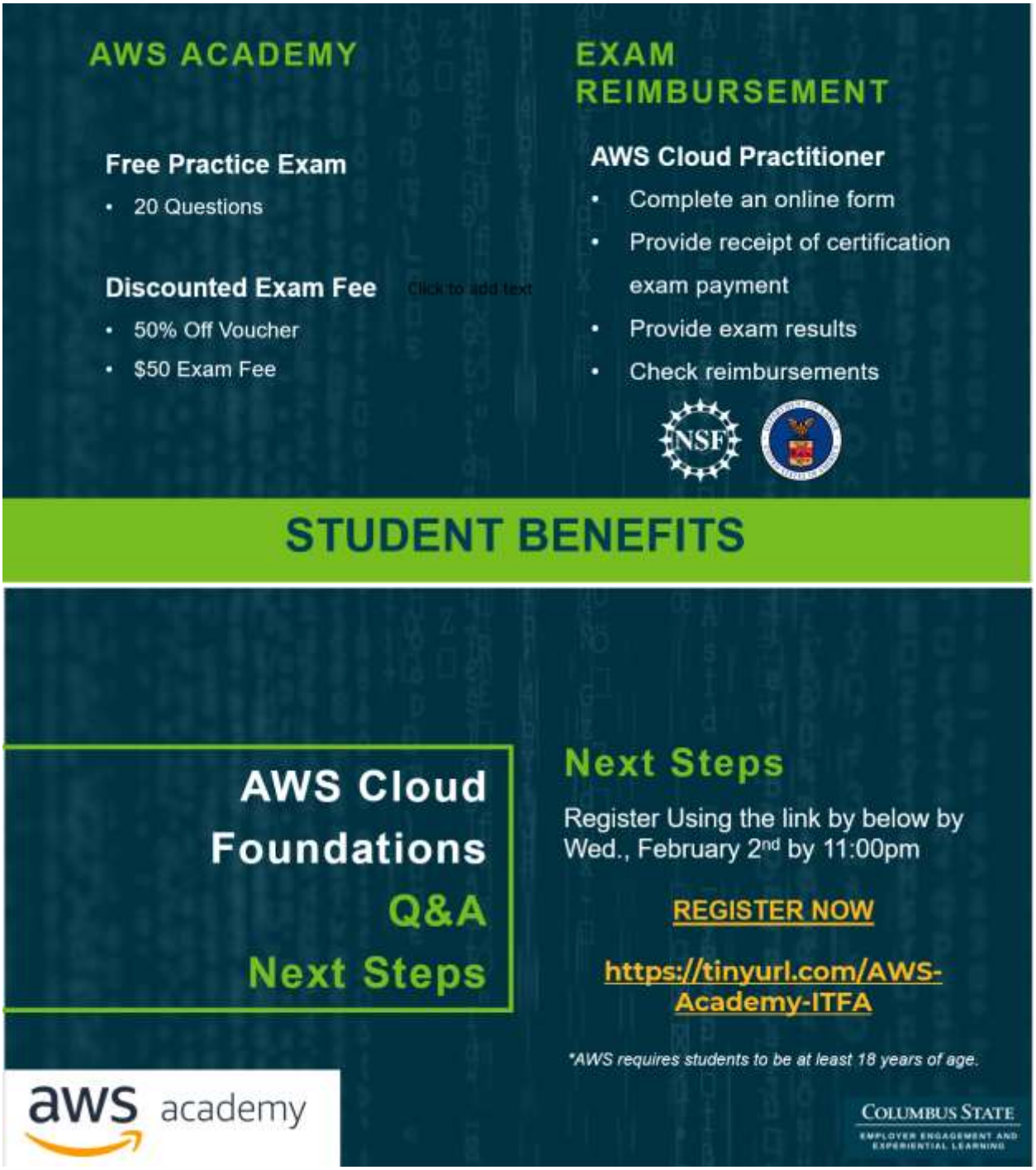
EMPLOYER ENGAGEMENT AND EXPERIENTIAL LEARNING
IT Flexible Apprenticeship
The Certification Experience
A Student's Perspective
Presented by: Duane Bruce
VIRTUAL INFORMATION SESSION


COLUMBUS STATE
EMPLOYER ENGAGEMENT AND EXPERIENTIAL LEARNING
IT Flexible Apprenticeship
The Opportunity and Related Logistics
Presented by: Tara Sheffer
VIRTUAL INFORMATION SESSION


Registration Deadline
February 2, 2022
Online Course Access
Self-Paced Learning
February 7, 2022 – June 15, 2022*
Course Orientation
Tuesday, February 8th from 5:00 – 6:00 PM
Bootcamp Review Sessions
Tuesday Nights from 5:00 – 9:30 PM
February 22, March 8, March 22, April 5
Exam Reimbursement Window
April 1 – June 15, 2022
PROGRAM TIMELINES
ONLINE SELF-PACED STUDY
AWS Authored Content
Video Presentations & Demos
White Papers
Online Labs
Knowledge Checks
CSCC Created Content
Practice Questions & Tests
LIVE ONLINE SUPPORT
Bootcamp Review Sessions
Tuesday Nights from 5:00pm – 9:30pm
February 22
March 8
March 22
April 5
COURSE FORMAT


AWS ACADEMY
Free Practice Exam
• 20 Questions
Discounted Exam Fee
• 50% Off Voucher
• $50 Exam Fee
EXAM REIMBURSEMENT
AWS Cloud Practitioner
• Complete an online form
• Provide receipt of certification exam payment
• Provide exam results
• Check reimbursements
NSF
STUDENT BENEFITS
AWS Cloud Foundations
Q&A
Next Steps
Next Steps
Register Using the link by below by Wed., February 2nd by 11:00pm
REGISTER NOW
https://tinyurl.com/AWS-Academy-ITFA
*AWS requires students to be at least 18 years of age.
aws academy
COLUMBUS STATE
EMPLOYER ENGAGEMENT AND EXPERIENTIAL LEARNING


COLUMBUS STATE
EMPLOYER ENGAGEMENT AND EXPERIENTIAL LEARNING
IT Flexible Apprenticeship
AWS Cloud Foundations
Thank You!
Self-Study, Bootcamp and Certification Opportunity
November 17, 2020
VIRTUAL INFORMATION SESSION

APPENDIX K – Software Development Employer Survey

Q1 Thank you for participating in this survey. The information you share will be used as part of a review of the Software Development curriculum at Columbus State Community College.

Q2 What is your organizational role?

- Human Resources/Talent Management
- Technical Hiring Manager
- Other _____

Q3 In what industry is your organization? _____

Q4 SKILLS This section will ask about the technical and professional skills that your organization considers when hiring for entry-level software jobs.

Q5 Technical Skills

Please select which of the following skills you look for when hiring for entry-level software jobs and use the text box to enter the specific technology your organizations uses:

- Blockchain technology _____
- CI/CD _____
- Cloud computing _____
- Concurrency _____
- Containerization (e.g., Docker, Kubernetes) _____
- CSS frameworks (e.g., Bootstrap) _____
- Data structures and algorithms _____
- Databases _____
- DevOps _____
- Encryption and cryptography _____
- Integrated development environments (IDE) _____
- JavaScript (e.g., React, Angular) _____
- Linux administration _____
- Networking _____
- Object relational mapping _____
- Performance tuning _____
- Single sign-on _____
- Software Requirements Gathering/Validation _____
- Software Design/Planning _____
- Software coding/development _____
- Software Testing _____
- Software Deployments _____
- Text editors _____
- Version control _____
- Web services _____
- Windows administration _____
- Other: _____

Carry Forward Selected Choices from Q5

Q6 For each selected skill/technology, please indicate the skill level[4] expected for an entry-level software hire.

	PROFICIENT (deep knowledge in area of practice; able to take full responsibility for work)	COMPETENT (good working knowledge in area of practice; able to achieve most tasks using own judgment)	BEGINNER (basic knowledge of key aspects in area of practice; needs supervision)
Blockchain technology	○	○	○
CI/CD	○	○	○
Cloud computing	○	○	○
Concurrency	○	○	○
Containerization (e.g., Docker, Kubernetes)	○	○	○
CSS frameworks (e.g., Bootstrap)	○	○	○
Data structures and algorithms	○	○	○
Databases	○	○	○
DevOps	○	○	○
Encryption and cryptography	○	○	○
Integrated development environments (IDE)	○	○	○
JavaScript (e.g., React, Angular)	○	○	○
Linux administration	○	○	○
Networking	○	○	○
Object relational mapping	○	○	○
Performance mapping	○	○	○
Single sign-on	○	○	○
Software Requirements Gathering/Validation	○	○	○
Software Design/Planning	○	○	○
Software coding/development	○	○	○

[4] https://icombine.net/knowledge-base/skill-levels

Software Testing	○	○	○
Software Deployments	○	○	○
Text editors	○	○	○
Version control	○	○	○
Web services	○	○	○
Windows administration	○	○	○
Other:	○	○	○

Q7 What technical skills and technologies not listed above is your organization looking for in an entry-level software employee? What level of proficiency do you expect? _____
Q8 For what technical skills does your organization provide training opportunities? _____
Q19 What technologies do you anticipate your company will be using in the future that you are not currently? _____

Q9 Programming Languages

Please indicate which the level of proficiency for each programming language you expect to see in candidates for entry-level software jobs:

	PROFICIENT (deep knowledge in area of practice; able to take full responsibility for work)	COMPETENT (good working knowledge in area of practice; able to achieve most tasks using own judgment)	BEGINNER (basic knowledge of key aspects in area of practice; needs supervision)	Not Applicable
C#	○	○	○	○
C++	○	○	○	○
Go	○	○	○	○
HTML/CSS	○	○	○	○
Java	○	○	○	○
JavaScript (client side)	○	○	○	○
JavaScript (server side with node.js)	○	○	○	○
PHP	○	○	○	○
Python	○	○	○	○

Rust	○	○	○	○
SQL	○	○	○	○
Other	○	○	○	○

Q10 What, if any, other programming language(s) would you expect? _____
Q10.5 If a candidate is unfamiliar with your current language of choice, what depth of knowledge would you expect in another language in order to consider the candidate?

- ○ Ability to write a basic program/function
- ○ Full SDLC Experience
- ○ Experience using advanced data structures and algorithms
- ○ Experience with our language of choice is required. No other experience is considered.

Q11 For what programming languages does your organization provide training opportunities? _____

Q12 What certifications does your organization look for in an entry-level software candidate?

	Necessary/Required	Helpful to have	Not applicable
[Name of certificate typed]	○	○	○
[Name of certificate typed]	○	○	○
[Name of certificate typed]	○	○	○
[Name of certificate typed]	○	○	○
[Name of certificate typed]	○	○	○

Q13 Professional Skills

Please rank the following list of professional skills, in the order of importance for hiring in your organization.
_____ EFFECTIVE COMMUNICATION (written, electronic, and oral communication; presentation skills; phone skills; ability to translate to colleagues and customers; interpersonal communications)
_____ TEAMWORK (ability to develop and maintain constructive working relationships; interacting respectfully and professionally with supervisors and co-workers; conflict resolution; working with others towards goals)
_____ PROBLEM-SOLVING (gathering information; generating possible solutions; thinking creatively; using critical thinking to resolve unexpected challenges; using sequential problem-solving techniques; using technical manuals)
_____ WORK ETHIC (adaptability and flexibility; delivering results on-time; demonstrating self-discipline; maintaining industry ethics; taking initiative)
_____ PLANNING AND ORGANIZATION (planning and scheduling tasks; prioritizing competing tasks; taking necessary action when off timeline)
_____ CULTURAL COMPETENCE (awareness of own worldview; ability to appreciate and interact effectively with people from different cultures or belief systems; ability to understand and effectively respond to cultural differences)

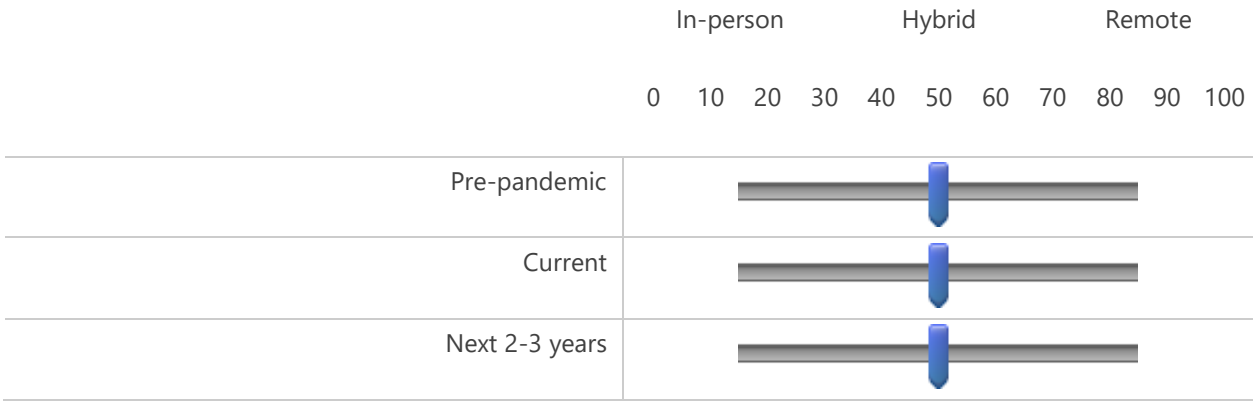
_____ REMOTE COLLABORATION (ability to engage in a virtual environment as part of a team with colleagues and clients)
_____ TIME MANAGEMENT (ability to organize, prioritize, and plan how to divide time among work tasks and activities)
_____ RISK MANAGEMENT (ability to identify points of vulnerability, analyze and monitor risk, and problem solve to reduce risk)
OTHER:

Q14 What, if any, other professional skills are important to your company? _____
Q15 For what professional skills does your organization provide training opportunities? _____
Q16 What is the minimum credential you consider for entry-level software candidates?

- Bootcamp
- Certificate
- Two-year degree (e.g., Associate's)
- Four-year degree (e.g., Bachelor's)

Display this question if Q16 = Bootcamp OR = Certificate OR = Two-year degree (e.g., Associate's)

Q17 What does your organization consider to be the benefits of hiring a candidate with credentials other than a four-year degree? _____
Q18 For what (if any) positions would you consider a candidate with a two-year degree?
Q19 For what (if any) positions would you consider a candidate with a certificate?
Q20 How would you describe your organizational environment for IT professionals in the following timeframes:



Q21 CSCC also offers the following educational pathways:

- Cybersecurity AAS
- Game Developer AAS
- Management Information Systems AAS
- Network Administrator AAS
- Software Developer AAS
- Web Developer AAS
- Computer Science - Data Analytics, Analysis, and Visualization AAS (in development)
- CCNA Routing and Switching Certificate
- Computer Literacy Certificate

- Data Center Technician Certificate
- Database Specialist Certificate
- IT Security Stackable Certificate
- IT Support Stackable Certificate
- IT Technician Stackable Certificate
- Linux Stackable Certificate
- Mobile Games App Certificate
- Network Administrator Certificate
- Software Developer Certificate
- Cisco Certified Network Administrator (CCNav7) Certificate (in development)

If you'd like us to contact you about opportunities in these areas, please include your contact information below:

Name _____

Title _____

Company _____

Email address _____

Phone _____

Appendix L – IT Explorers Flyer

COLUMBUS STATE COMMUNITY COLLEGE

CCP EXPLORES: INFORMATION TECHNOLOGY

Early career exploration for high school students interested in IT

The rapidly growing IT industry is expected to outpace the overall economy's growth in the coming years, and demand for skilled workers in a variety of roles will be high. Columbus State Community College is offering a sequence of CCP courses for high school students to explore the foundations of information technology. Through the program, high school students earn college credit while getting first-hand experience in their potential field of interest. Special events and activities outside the classroom provide further career exploration opportunities.

Courses

All courses are currently offered online and will be taught by Columbus State faculty. Columbus State has been a regional leader in online education since 1997 when we launched our first online class. We were the first college in Ohio approved by the Higher Learning Commission to offer degrees entirely online. Our faculty are solely focused on student learning and success and equipped with the tools and training they need to inspire and engage students online. Students can expect a high-quality experience that's also safe and flexible.

	Exploration	Dedicated Pathway	General Education (Optional Add-On)
Semester 1	CSCI 1101	CSCI 1101 CSCI 1103**	ENGL 1100
Semester 2	CSCI 1103**	CSCI 1145 CSCI 1320	SBS XXXX or HUM XXXX*
Semester 3	CSCI 1145	CSCI XXXX* CSCI XXXX*	SBS XXXX or HUM XXXX*
Semester 4	CSCI 1320	CSCI XXXX* CSCI XXXX*	NAT XXXX*

*Please meet with your advisor to discuss what options are available.
**Requires placement into MATH1075 or higher to be eligible for course.

Additional Events
Students will have the opportunity to learn about academic programs and transfer opportunities, engage with Columbus State Career Services for guidance, and speak directly with professionals in the IT field.

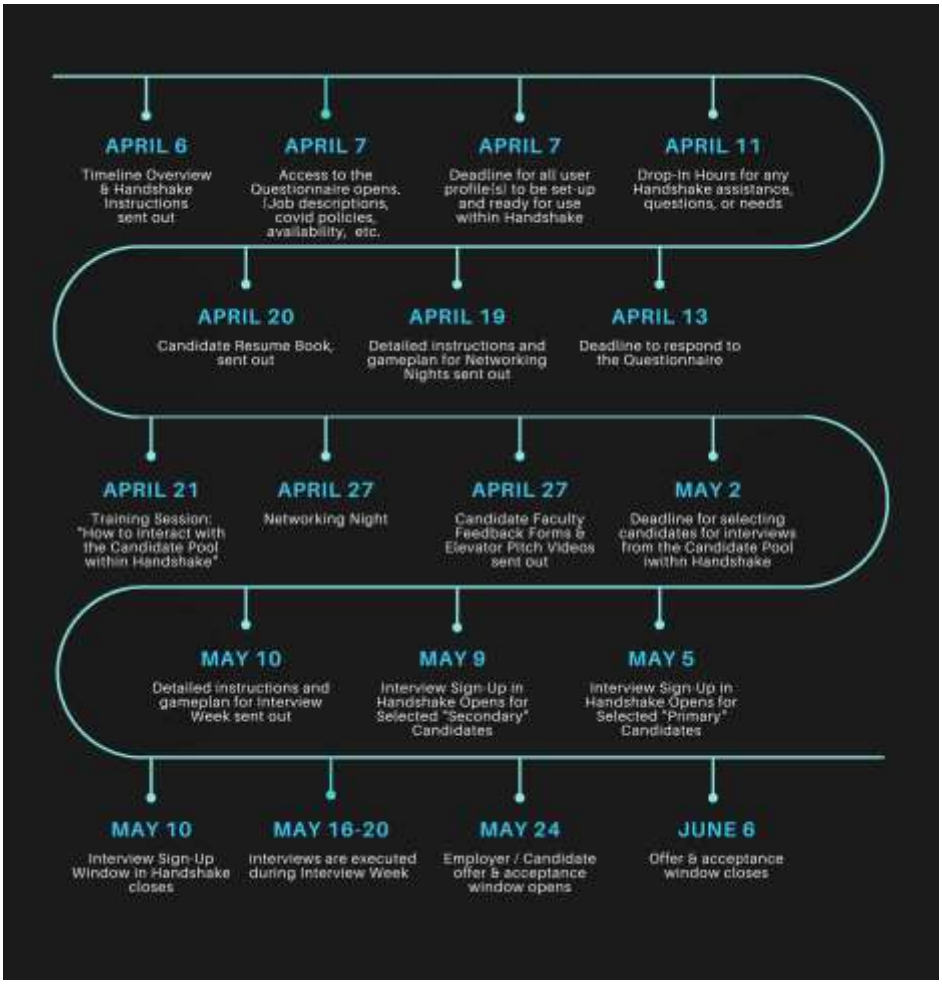
Next Steps: If you have a student who is interested in taking one or more of these courses, please have them contact **CCPadvising@cscc.edu**

APPENDIX M – Networking, Interview, and Placement Timeline and Instructions

Hello and welcome:

Thank you for participating in the networking, interview, and selection process for the 2021 cohort participants of the ITFA Program at Columbus State. Below you will also find a visual timeline overviewing this process throughout the next couple of months, and below that, you will see step-by-step instructions, resources, and deadlines relating to you and your companies role in this process. We've tried to keep this process as streamlined as possible for you by allowing you to simply follow the steps detailed below. It is very important that you read all of the below in its entirety and respond to requested items by their associated deadlines.

Process Timeline Overview



For accessibility and screen reader capability, download this PDF of the timeline. It is also recommended that you right-click links and open them in a new tab rather than exiting this webpage by direct clicking links.

STEP 1: Set-up your Handshake user profile by April 7th

Please use the link below to have your account set-up in Handshake no later than Thursday, April 7th. To determine where you are with setting up your Handshake user profile, you will first need to review if you, and/or anyone on your team that will interact with the candidate pool in Handshake, have a user account connected to your companies Handshake profile.

Link to create Handshake profile: **https://app.joinhandshake.com/employer_registrations/new**

This is pretty simple - just follow the link above and the system will use the domain found within your work email to connect you automatically with your company profile. Also, if you already have an account, it will let you know that as well.

Here's a step-by-step walkthrough YouTube video for anyone who may need it: **https://youtu.be/senri4wHPb0**

If you have any challenges at all with setting up your Handshake profile, please use the April 11th 11 a.m.-12 p.m. calendar appointment we sent to all of your calendars called "Handshake Assistance Open Drop-In Hours".

STEP 2: Complete the Employer Response Questionnaire ASAP but no later than April 13th

Link to Questionnaire: **https://cscc.joinhandshake.com/edu/surveys/73884**
You will have access to the required Employer Response Questionnaire via the link above once you have successfully set-up your Handshake profile. The sooner the questionnaire is completed, the better, as we are able to use your responses to help coordinate logistics, but the questionnaire needs completed no later than April 13th. This questionnaire will collect the following items, so please be sure you have them prior to starting your submission:

1. Job Descriptions
Many employers have shared that it would be helpful to ensure that the student candidates are aware of the expectations and duties for the roles you all are offering prior to them entering those roles, as each of these roles will differ across each employer. Therefore, the questionnaire will ask that each of you upload a basic description for each role you are an ITFA 2021 cohort Apprentice may fill.

2. Yours and/or your team's availability for Interview Week
The last thing the questionnaire will ask you to supply are what the windows of availability that you'd like to offer for candidates to choose from for scheduling their 1 hour interviews with you. We will utilize this information to build the automated interview invite communication plan and the corresponding interview sign-up availability windows for candidates to choose from. For each date of Interview Week (May 16th-20th) the date and time window options on the questionnaire will include:
Option 1: All-Day (8am-5pm)
Option 2: Morning Only (8am-Noon)
Option 3: Afternoon Only (1pm-5pm)
Please be advised: It is very important that we receive a response to the questionnaire with the requested items prior to end-of-the-day on April 13th from each participating employer. If a questionnaire submission is not received by a representative of your company by April 13th, your company may not qualify to participate in this year's Networking Night and Interview Week - so please make this a priority!

STEP 3: Review the Game Plan for Networking Night
An overview of what to expect for Networking Nights as well as detailed instructions for your role in the events will be sent out to you all by April 19th.
Please review this game plan in detail between April 19th and April 26th and ensure any participating members of your team have also reviewed these instructions prior to your companies Networking Night taking place on April 27th. We will send out holds for Networking Night and Interview Week to each of you calendars.

STEP 4: Review the Candidate Resume Book & Elevator Pitch Videos
The resume book for candidates who met the ITFA program's Career READY requirements will be sent to you on April 20th. Please review the resume book prior to Networking Night. Faculty Feedback and Elevator Pitches will be sent immediately following Networking Night. As a reminder, each candidate appearing in the resume book has completed the requirements to reach Career READY status. These requirements include:
A resume approved by a certified Career Counselor at Columbus State
A mock interview approved by a certified Career Counselor at Columbus State
Completion of all front-loaded academic technical coursework with a passing grade and a maintained overall GPA of 2.0 or higher

STEP 5: Attend the Candidate Pool Handshake Training on April 21st
We will add a virtual training to your calendars for April 21st and please plan to attend if you are the one(s) that will be selecting candidates for interviews within Handshake following Networking Night.
This should be relatively straightforward once you have your profile set-up and activated in Handshake but wanting to ensure you all have instructions for making your interview selections as these selections are due within Handshake no later than May 2nd. This session will also be recorded in the event you are not able to attend.

STEP 6: Attend Networking Night on April 27th
As mentioned above, we will be sending out detailed instructions by April 19th. This event will be hosted virtually online.
For now, you should see a hold for Networking Night on your calendars either now, or coming shortly for April 27th. Just be sure to submit your questionnaire response with interview week availability no later than April 13th and review the gameplan that will be sent out on April 19th.

STEP 7: Select candidates for interviews within Handshake by May 2nd
By this step, you should feel comfortable interacting with Handshake and should have either attended the training for how to interact with the candidate pool within Handshake, or watched the recording. Simply put, we will assign the Candidate Pool to you, and anyone else you identify, within Handshake where you will then be able to select who you'd like to interview post-Resume Book and Networking Night. Within Handshake, you will select one of the following ratings for each candidate in the pool:

(1) Primary
This is your first choice interview candidates and will have priority access to the interview scheduler. **Their access to the interview scheduler opens on May 5th.**

(2) Alternate
These are your secondary choices and will have access to the interview scheduled 4 days after primary candidates. **Their access to the interview scheduler opens on May 9th.**

(3) Declined
For one reason or another, you may have candidates you aren't interested in interviewing and this is the selection choice to identify those candidates.
The window for candidates to schedule their interviews will close May 10th. This means you and/or your team will then be able to access the finalized interview schedule for Interview Week on May 11th.

STEP 8: Review the Game Plan for Interview Week (taking place May 16-20)
On March 10th, we will send out the game plan for Interview Week with detailed instructions. Please ensure you and/or your team that will be participating in Interview Week has reviewed this thoroughly.
As mentioned previously, the sign-up window for scheduling interview times will open for student candidates on May 5th and close May 10th.

STEP 9: Execute scheduled interviews during Interview Week (taking place May 16-20)

More details regarding interview week are forthcoming. Consistent with years past you will have the discretion of determining the virtual meeting platform used for interviews. Additionally, you will be responsible for communicating this information to candidates scheduled for interviews.

STEP 10: Make offers & receive acceptances (starts May 24th)
You and/or your HR team will make offers to candidates directly and candidates have been instructed to follow the acceptance and onboarding procedures as detailed by the employer they choose to accept an offer from. There will be multiple offer rounds so that if you receive declines to offers as candidates make their acceptance choices, there will be multiple opportunities to make additional offers to available candidates. You can make offers via handshake, direct emails, or phone calls. Students will be ready to receive offers via any of these methods. We here at Columbus State simply request to be kept in the loop so that we can continue to support you and the student candidates during this time. Things that we may ask for include:

The **hourly rate or salary** offered.
The **hours and schedule** the candidate is being asked to work.
An **overview of the OJT**, or On-The-Job-Training, that each candidate will partake in over the course of their time working as a work-study apprentice with your organization.
The **names and contact information of their direct supervisor and mentor(s)**. Please remember that it is very important that they have access to a mentor(s) that are not their direct supervisors.

Final Step: Hired candidates get to work
From here, it will be time for hired candidates to begin working with you on-site. Most candidates will begin working anytime on or after July 1. We have tried to make the process as simplified and streamlined as possible for you all and realize there may be things I missed or questions that you have that are not answered. Please use my cell phone number anytime if you have immediate needs or questions.

David Cofer, **614-738-0844, dcofer@cscc.edu**
I look forward to assisting you all and our student candidates throughout this process.

Appendix N – IT Modules Teacher Interview Protocol, Part 2

Implementation

1. What worked well in your experience of completing these modules? What challenges did you experience? What could be improved, and how?
    a. *Prompts:* number of courses, course content, course format, course platform, instructors

2. What types of support were made available to you? Did you use these? If so, how?
    a. *Prompts:* learning center, faculty office hours, etc.

3. How would you describe the role of your district in providing support and guidance for your participation in this program?

Impact

1. A goal of these modules is to prepare individuals to teach in six areas of information technology (i.e., IT fundamentals, web development, database management, computer networking, and system administration). What difference did this program make in your ability to effectively teach these in your district?

2. What changes or initiatives are you planning to implement as a result of this professional development experience?

3. Think back on your experience over the course of these modules – what was particularly relevant to your current/planned work in your district? Why was it relevant?

4. As you think ahead to the implementation of _____, what parts or aspects of the program do you think will be most useful? What do you wish it had included to make it even more useful?

Anything else?

Appendix O – Conference Session Descriptions

2021 ATE PI Conference

Career READY. Competencies-Based Career and Professional Development. Columbus State Community College's career services team developed the Career READY program in response to the growing requests for soft skills training and professional development for pre-apprenticeship students. The Career READY program streamlined previous one-off trainings and focuses on a competencies-based career education curriculum. This training has been used widely across STEM academic programs, has received input from industry employers, and is evaluated for effectiveness annually. During the session, presenters will discuss how the program was adapted to better engage and prepare students.

Gameful Mentorships. Creating Engaging Student- Employer Connections. Gamification is generally defined as the use of game-design elements in non-game concepts. The gameful mentorship program allows mentors to help students learn and apply career competencies and skills while networking with industry professionals. In this session, the presenter will demonstrate tools and resources used to create gameful activities with mentors. Attendees will leave with ideas for immediate implementation into existing mentoring programs.

HI-TEC 2022

Meaningful Co-curricular Programming Creating More On-Ramps for Career Opportunities. Established apprenticeship programs like the IT Flexible Apprenticeship have proven that students who participate in industry-hosted experiential learning opportunities graduate with less debt, more experience, and often more offers for full-time employment. Related programs like scholarships, clubs, and K-12 career exploration opportunities have emerged as excellent partners in providing professional experience long before the two-year associate degree and apprenticeship experience begins, such as career exploration summer camps for high school students, dual-enrollment course bundles in specialized areas like the IT Explorers program, enriching co-curricular supports throughout a student's time at Columbus State, and opportunities for alumni.

Employer Engagement and the Pathway to Developing Innovative Student Development Programming: Part I. Structured and intentional employer engagement is one of the hallmarks of the IT Flexible Apprenticeship program at Columbus State Community College (CSCC). During a 2020 employer roundtable conversation, our partners expressed an interest in engaging with students earlier in the process, prior to high-stakes interactions such as networking and interviews. Simultaneously, CSCC's Career Services was exploring the launch of an innovative student mentorship initiative. From this convergence of opportunity emerged the Gamification Mentorship initiative. Born out of the COVID era, the Gamification Mentorship program is a virtual, gamified student development initiative. Attend this session and learn more about the origins, design, implementation process, and pilot results.

Employer Engagement and the Pathway to Developing Innovative Student Development Programming: Part II. During a 2020 employer roundtable conversation, our partners expressed an interest in engaging with students earlier in the process, prior to high-stakes interactions such as networking and interviews. Going beyond just their involvement in hosting our students in apprenticeship positions, we've found that bringing the industry perspective into career exploration summer camps for high school students, dual-enrollment

course bundles in specialized areas like the IT Explorers program, enriching co-curricular supports throughout a student's time at Columbus State, and opportunities for alumni have created a really vested interest in the talent pipeline in the industry sector and everyone benefits.