

REPORT

INTERIM REPORT

Developing Competency-Based Program Models in Three Community Colleges

April 30, 2014

Ann E. Person
Lisbeth Goble
Julie Bruch

Submitted to:
Sinclair Community College
444 West Third St.
Dayton, OH 45402-1460
Project Officer: Nancy Thibeault

Submitted by:
Mathematica Policy Research
505 14th Street
Suite 800
Oakland, CA 94612
Project Director: Ann E. Person
Reference Number: 40144

This page has been left blank for double-sided copying.

ACKNOWLEDGMENTS

We would like to thank the many people who contributed to the effort of preparing this report. For their patient and careful responses to multiple requests for information, we are especially indebted to the faculty and staff members who helped us at Austin Community College, Broward College, Sinclair Community College, and Western Governors University. In particular, we would like to recognize Nancy Thibeault and David Siefert, the consortium co-directors at Sinclair, for their broad vision and careful guidance. Sally Johnstone at Western Governors University provided important conceptual input and feedback on early drafts. At the partner colleges, Christi Amato, Mary Benedict, Sam Greer, Mary Kohls, and Annie Myers provided detailed information throughout the process. At Mathematica, Alec Millar was instrumental in preparing tables on program progress, Neil Seftor offered insightful feedback on the draft report, and Sheena Flowers provided secretarial support.

This page has been left blank for double-sided copying.

CONTENTS

I	BACKGROUND AND INTRODUCTION	1
	A. What is competency-based education, and why adopt the model?	2
	B. Project goals	3
	C. Project organization	4
II	WESTERN GOVERNORS UNIVERSITY COMPETENCY-BASED MODEL	7
	A. Staffing	7
	B. Curriculum development	8
	1. Program and course development	8
	2. Assessment development	9
	3. Course delivery	9
	C. Student support services	9
	1. Student recruitment and intake	10
	2. Learner supports	10
	3. Career services	11
	D. Organizational procedures and policy context	12
	1. Accreditation	12
	2. Financial aid	12
	3. Articulation	12
III	SINCLAIR COMMUNITY COLLEGE: ACCELERATE IT PROGRAM	13
	A. Staffing	14
	B. Curriculum development	15
	1. Program development	15
	2. Course development	15
	3. Assessment development	16
	4. Course delivery	17
	C. Student support services	19
	1. Student recruitment and intake	19
	2. Learner supports	20
	3. Career services	20

	D. Organizational procedures and policy context	21
	1. Accreditation	21
	2. Financial aid	22
	3. Articulation	22
	E. Scale-up and expanding enrollment.....	22
IV	AUSTIN COMMUNITY COLLEGE: ACCELERATED PROGRAMMER TRAINING.....	23
	A. Staffing.....	23
	B. Curriculum development.....	24
	1. Program development.....	24
	2. Course development.....	24
	3. Assessment development.....	25
	4. Course delivery	26
	C. Student support services	26
	1. Student recruitment and intake	26
	2. Learner supports	27
	3. Career services	28
	D. Organizational procedures and policy context	28
	1. Accreditation	28
	2. Financial aid	28
	3. Articulation	29
	E. Scale-up and expanding enrollment.....	29
V.	BROWARD COLLEGE: COMPUTER SYSTEMS SPECIALIST CBE PROGRAM	31
	A. Staffing.....	31
	B. Curriculum development.....	32
	1. Program and course development.....	32
	2. Assessment development.....	33
	3. Course delivery	34
	4. Virtual lab	34
	C. Student support services	34
	1. Student recruitment and intake	34
	2. Learner supports	35
	3. Career services	36

D.	Organizational procedures and policy context	36
1.	Accreditation	36
2.	Financial aid	36
3.	Articulation	37
E.	Scale-up and expanding enrollment.....	37
VI	INTEGRATIVE ANALYSIS AND CONCLUSIONS	39
A.	Cross-college analysis of program models	39
1.	Areas of convergence	39
2.	Areas of distinction.....	41
B.	Progress to date	43
C.	Lessons learned	46
1.	Accelerated, competency-based education models are not for all students	46
2.	CBE programs require changes to community college institutional culture.....	46
3.	Faculty are central to the success of CBE models and may be key to sustainability.....	47
4.	Expanding enrollment may require decreased program intensity	47
D.	Next steps.....	47
	REFERENCES.....	49
	APPENDIX A. STUDY METHODS	A.1
	APPENDIX B. SCC SAMPLE COMPETENCY MAP	B.1
	APPENDIX C. SCC COACHING AGREEMENT	C.1

TABLES

III.1	Comparison of SCC traditional and CBE programs.....	13
III.2	SCC course delivery modalities and student supports	18
VI.1	Comparison of lead* staff for key program components.....	41
VI.2	Partner college progress on grant deliverables	44
VI.3	Status of WGU deliverables.....	45
VI.4	Actual and projected unique enrollments by partner college	46

FIGURES

I.1	High-level logic model of the consortium CBE project.....	3
I.2	Consortium project organizational chart	5
II.1	WGU staffing model.....	7
III.1	SCC Accelerate IT staffing model.....	14
III.2	SCC Accelerate IT student intake process	20
III.3	SCC Accelerate IT career advising model.....	21
IV.1	ACC Accelerated Programmer Training staffing model.....	23
V.1	Broward College CBE program staffing model	32

This page has been left blank for double-sided copying.

I. BACKGROUND AND INTRODUCTION

In September 2011, the U.S. Department of Labor (DOL), Employment and Training Administration (ETA) announced the first round of grants under the new and ambitious Trade Adjustment Assistance Community College and Career Training (TAACCCT) grants program. Under this program, DOL is awarding \$500 million in grants each year, from 2011 through 2014, to individual community colleges and groups of institutions working together as consortia. The broad goals of the TAACCCT program are (1) to increase attainment of degrees, certificates, and other industry-recognized credentials that provide skills for employment in high-wage, high-growth fields; (2) to introduce or replicate innovative and effective curricula that improve learning that is relevant to employment; and (3) to improve employment outcomes for participants, especially those eligible for Trade Adjustment Assistance (TAA) and other economically dislocated and low-skilled adult workers. The TAACCCT program requires that applicants address five “core elements” in their programs: (1) evidence-based design, (2) stacked and latticed credentials, (3) online and technology-enabled learning, (4) transferability and articulation, and (5) strategic alignment.

In October 2012, under Round 2 of the TAACCCT grants program, DOL awarded a \$12-million grant to a consortium led by Sinclair Community College (SCC) to fund a three-year project titled “Adapting and Adopting Competency-Based IT Instruction to Accelerate Learning for TAA-Eligible, Veterans, and Other Adult Learners.” Under the grant, lead college SCC and co-grantees Broward College (BC) and Austin Community College (ACC) are implementing programs in which they are “adapting and adopting” the Western Governors University (WGU) model of competency-based education (CBE) in four distinct information technology (IT) programs: (1) programming at ACC, (2) technical support at BC, and (3) networking and (4) software development at SCC. WGU is providing consulting and technical assistance to help the institutions address issues faced when adapting their programs to time-variant, competency-based models.

Starting with Round 2 of the TAACCCT grants, DOL required that all grantees commission an independent evaluation of their funded programs. DOL specified that all grantee evaluations should address both program implementation and outcomes or impacts. As the consortium’s lead college, SCC contracted with Mathematica Policy Research to serve as the external evaluator for the consortium’s TAACCCT-funded project. This report, which provides the first analysis of program implementation by the consortium colleges, serves three primary purposes: (1) to document, at or near baseline, the program model that each of the participating colleges is implementing; (2) to report to the consortium and to DOL on the first year of program implementation under the grant; and (3) to inform potential replication by describing for external audiences how CBE models can be designed and launched in different institutional contexts. Appendix A explains the research methods Mathematica used to generate this report.

The report is organized into six chapters. The rest of this introductory chapter provides a high-level description of the consortium’s grant-funded project, detailing the overarching project rationale, goals, and organization. Chapter II describes the WGU model of CBE, which serves as the point of departure for the consortium’s three community colleges as they develop their own programs. Chapters III-V use a common analytic lens to describe each of the partner colleges’ approaches to implementing their own model of CBE. Chapter VI concludes with analysis of the

consortium’s progress to date and discussion of common themes and differences across the colleges, highlighting key lessons learned in the first phase of grant implementation.

A. What is competency-based education, and why adopt the model?

There is no single, authoritative definition of “competency-based education,” but it is generally distinguished from other educational approaches by a few key features. First, all learning outcomes—the required competencies—are precisely defined so as to be measurable. Most CBE programs are focused on preparation for specific jobs, from which the competencies are derived. Second, the student must demonstrate mastery of each competency before moving on to the next. Some CBE models use “direct assessment,” which allows students to skip program content related to a competency if they can demonstrate mastery on an assessment. This supports a final characteristic common to CBE: the potential to accelerate the student’s progress through the educational program.

CBE is not an entirely new concept, but it has ignited a great deal of public interest in recent years. WGU is considered a pioneer of CBE, and the university has been a prominent voice in national conversations about CBE. WGU’s model generally exhibits the characteristics described above, though their model is course-based (it is not based solely on direct assessment). A recent report, which was informed by WGU’s experience working with the SCC consortium and about a dozen other community colleges, distilled the foundational principles of CBE as follows:

- 1) **The credential must reflect robust and valid competencies.** Because competencies are the core of any CBE curriculum, they must align with both academic and industry standards; they must accurately represent the skills and knowledge needed for the next stage of the student’s development, typically employment in a particular field.
- 2) **Students should be able to learn at their own pace and should be supported along the way.** Self-paced learning is another cornerstone of CBE, and it requires that students have help at the moment they need it (“just-in-time” academic assistance).
- 3) **Effective learning resources should be continuously available and reusable.** With students working through material on their own, the quality and availability of learning resources is paramount and should be continuously monitored.
- 4) **Assessments should be reliable and secure.** Because the robustness and validity of competencies are critical to CBE, it follows that assessments must be able to measure student mastery of them.

Rather than presenting these principles as a rigid set of requirements for all CBE programs, however, the report suggests that institutions adopt them “to fit their own campuses, systems, and state structures” (Johnstone and Soares, 2014).

Consortium leadership chose to adopt a CBE model because they believe it has transformative potential for postsecondary education and workforce training. In their proposal to DOL, they asserted that the TAACCCT-funded project would “revolutionize educational delivery to accelerate credential attainment for TAA-eligible workers, veterans, and others by translating traditional seat-time based programs into ones in which students earn certifications, certificates, and degrees by demonstrating the knowledge, skills, and abilities defined by IT employers.” So for the consortium, the transformative power of competency-based models rests

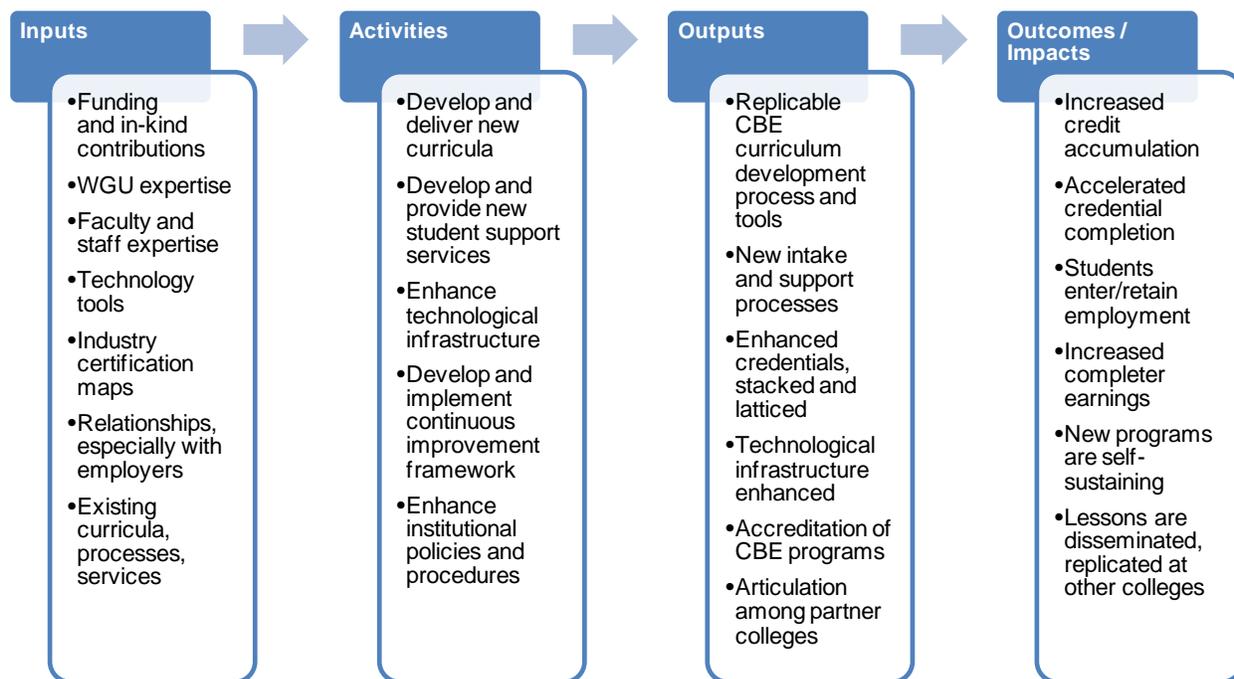
in three of CBE's primary features, each of which is an adaptation of one of the principles described above: (1) *acceleration* through a delinking of the curriculum from traditional academic terms based on "seat-time" (corresponding to principle 2 above); (2) students' *demonstration* of relevant knowledge and skills, (corresponding to principle 4), and (3) validation of program content in its *relevance to employment* (corresponding to principle 1).

Each partner college has further adapted the principles of CBE to their own campus context. We describe the specific features of each college's model in Chapters III-V, and we highlight similarities and differences in their adaptation of the principles of CBE in Chapter VI.

B. Project goals

In the project work plan,¹ the colleges have laid out 32 grant "deliverables" corresponding to a set of inputs (resources), activities (processes), and outputs (milestones). Figure I.1 displays a high-level logic model for the TAACCCT project, noting the key inputs, activities, and outputs, as well as the ultimate outcomes or impacts that the colleges hope to achieve through the grant.

Figure I.1. High-level logic model of the consortium CBE project



The project's overarching goals, as indicated in Figure I.1, are to:

¹ As a result of negotiations with DOL during the award process, the project scope changed somewhat. Under SCC leadership, the partner colleges and WGU worked with Mathematica to revise the original project work plan that was submitted with the TAACCCT grant application. The newly specified resources, activities, milestones, and outcomes are stored in a QuickBase project management database. Partner colleges, WGU, and Mathematica have access to the database where all can track progress toward each grant deliverable.

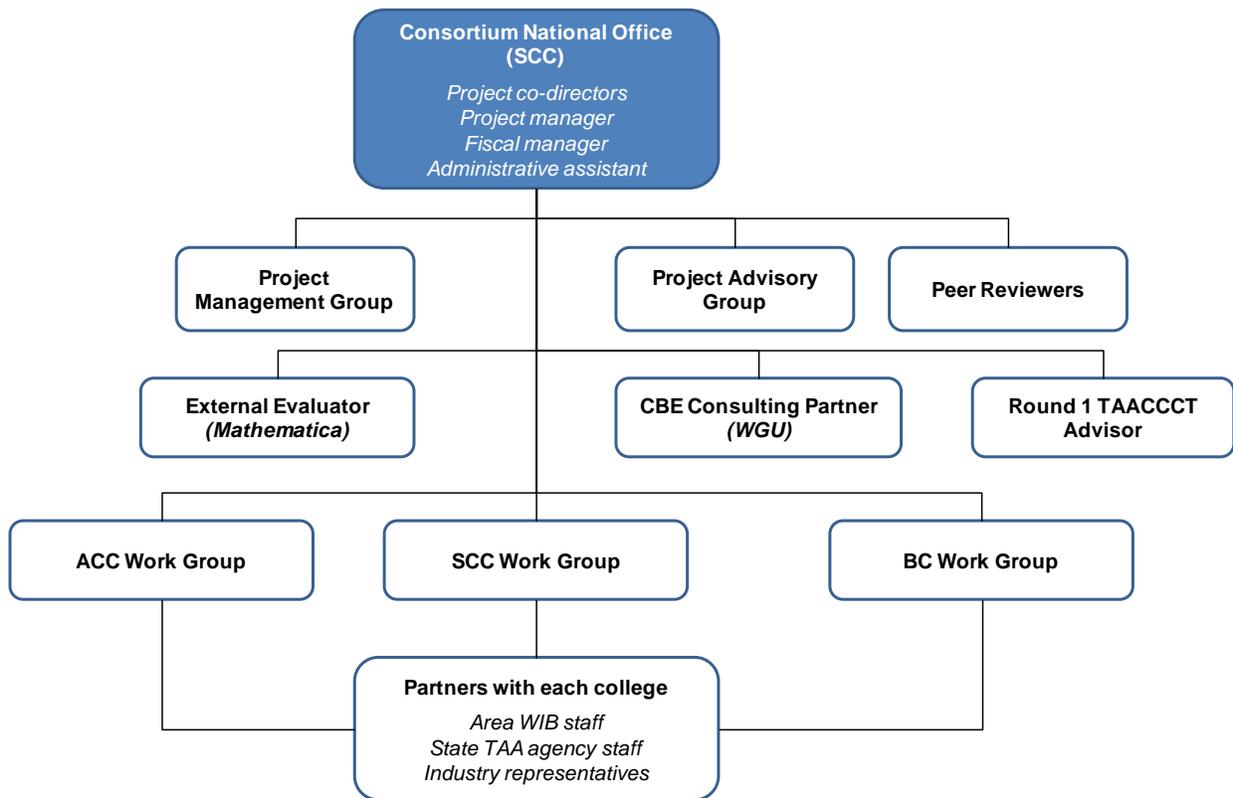
- Develop a new and replicable CBE curriculum development process that will ensure that competencies, content, and assessments are continuously improved and widely disseminated.
- Develop and provide new student support services that address the particular needs of TAA-eligible workers and other students in CBE programs.
- Enhance the technological infrastructure for delivering CBE courses and assessments.
- Offer a full suite of courses in several IT programs that lead to a series of stackable and latticed credentials with labor market value.
- Address the organizational procedures and policies to allow students to progress through CBE programs of study that are delinked from traditional academic terms.

In addition to these substantive goals, the consortium is striving to meet the student participation targets that were specified in their original TAACCCT grant application. The targets are extremely ambitious, as they originally presumed inclusion of WGU students, as well as students from the three community colleges. Since WGU is serving in a consulting role, however, it was determined that their students should not be included in the TAACCCT participation totals. As a result, the partner community colleges will be responsible for serving almost double the number of students they had originally proposed to serve. The colleges are currently developing plans for expanding their enrollments to meet these targets. We describe each college's plans for scaling up their programs and expanding enrollment in Chapters III-IV.

C. Project organization

Figure I.2 provides an overview of the project's organization. As noted above, SCC serves as the lead college and is therefore home to the consortium national office, which houses the overarching project administrative team. Each partner college has their own work group, including local project management at ACC and BC. WGU serves in a consulting role and Mathematica is the external evaluator.

Figure I.2. Consortium project organizational chart



This page has been left blank for double-sided copying.

II. WESTERN GOVERNORS UNIVERSITY COMPETENCY-BASED MODEL

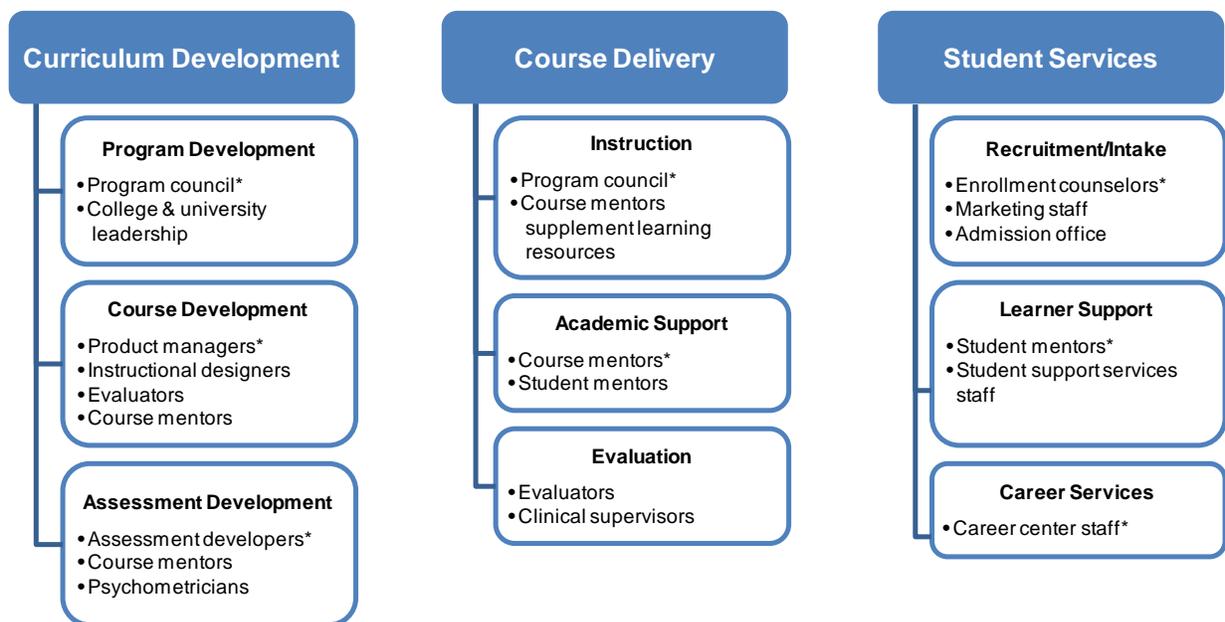
WGU is a fully online university that offers competency-based degree programs to students in all 50 states. Currently, more than 40,000 students are enrolled in bachelor's, master's, and other post-baccalaureate programs at WGU's four colleges: business, teachers college, IT, and health professions.

The crux of WGU's definition of CBE is that students are assessed on the skills and knowledge they will need for the next stages of their development, whether that entails further education or employment. A key component of the model is that students progress through coursework independently, at their own pace, rather than according to a traditional academic term schedule. Course materials are delivered through innovative technologies that allow students to access learning resources from any location with an internet connection at any time of the day, 365 days a year. The university also offers comprehensive services that support students from enrollment through job search.

A. Staffing

At WGU, curriculum and student support services are delivered through a unique disaggregated staffing model in which the faculty role is "unbundled." Rather than the traditional role, where faculty develop courses and assessments, teach courses, grade assignments and assessments, and provide tutoring or academic support to students, WGU assigns each of these tasks to different groups of professionals, with some involvement from external industry experts. Full-time "faculty" instead serve as "mentors," focusing primarily on supporting students as they work through courses and providing supplemental materials as needed. Figure II.1 shows how the curricular and support roles are distributed among different WGU staff members; the various services and roles are described in more detail throughout this chapter.

Figure II.1. WGU staffing model



*Lead role

B. Curriculum development

1. Program and course development

WGU offers CBE programs in four academic areas: business, teaching, IT, and health professions. A diverse group of external and internal stakeholders is involved in the multi-stage process of developing programs and courses, as described below:

- 1) To identify new programs to develop and revisions that should be made to existing programs, each college has a program council made up of external industry experts and academics² who meet two to four times a year and are continuously evaluating trends in industry and higher education.
- 2) Based on the input of the program council, WGU staff oversee market research on the demand for programs from students and employers. Much of this research is conducted by third-party vendors. WGU staff members also examine potential overlaps with existing programs.
- 3) When developing a new program, the team identifies high-level competencies that cover the general scope of expertise in that field. They then map the competencies to topics to be covered in each degree program. The team responsible for this process includes the college's national director (similar to a dean); the product manager, who oversees the development of new programs and courses; at least one course mentor (that is, instructor) from each course; instructional designers; part-time faculty who grade assessments; and external subject-matter experts, some of whom have experience with course development.
- 4) The next step is for the team to organize the topics into courses and to identify specific course-level learning objectives.
- 5) Instructional designers identify learning resources associated with each learning objective. They consult with vendors about existing resources; if none exist, they contract with vendors to develop new resources.
- 6) The program development team reviews the learning resources to determine whether they are aligned with learning objectives and whether there are gaps in the resources that need to be filled by course mentors. Course mentors can then develop additional materials and identify resources to fill the gaps.

While this is the typical process for new programs and courses, some courses already have clear competencies either because they are general education subjects that do not require external industry input (for example, a general education writing course) or because there is a national certification exam that already defines the learning objectives (such as the National Council Licensure Examination for nurses). In these cases, the development team will begin with identifying and developing learning resources rather than defining competencies and learning objectives.

² WGU staff attend program council meetings, but they do not sit on the councils. There are also separate program councils for general education and for assessments.

Courses are continually revised based on input from the program councils, analysis of student performance data, and feedback from WGU students and faculty.

2. Assessment development

WGU courses involve several types of assessments, including objectively scored exams, performance assessments, and clinical or field experiences.³ Some objectively scored exams and all performance assessments are developed within WGU. As with course development, course mentors are not directly responsible for developing assessments, though they are consulted about the in-house assessments. Other assessments are overseen by third parties, either national certification bodies or clinical supervisors at job sites.

Students located throughout the country can choose to take WGU assessments in person or via online proctoring. In-person options include taking the assessment at a WGU office or at a WGU partner testing site. Because traveling to a testing site is often inconvenient, most students choose the online option that allows them to take assessments from home using their personal computer and a WGU-supplied webcam. Proctors from Kryterion or ProctorU—two proctoring vendors used by WGU—watch the student take the assessment via webcam. The webcam allows proctors to determine that there are no other people in the room and that students are not using notes or other prohibited resources. All other browsers and applications are shut down while the student is taking the exam, and students' identities are confirmed with keyboard biometrics or questions like those used in the insurance industry.

Assessments are graded electronically when possible or manually by WGU or third-parties. Performance assessments—for example, projects, essays, or lab reports—are assessed by WGU's approximately 600 graders who are part-time faculty, often with Ph.D.'s in the field and teaching experience. A WGU staff person manages the graders, overseeing constant calibration exercises among them to ensure consistency, and managing workflows so that graded assessments are returned to students within 72 hours. To maintain objectivity, graders do not work directly with students; but they do provide feedback to both students and their mentors. Clinical or field experiences are assessed by clinical supervisors who work on site (for example, a nurse who works at a hospital where a student is completing a clinical experience).

3. Course delivery

The key features of WGU's course delivery are that it is fully online and self-paced, with course mentors available to support students as they move through course materials. After completing the intake procedures (described below), students can enroll in courses on the first day of any month. Their tuition covers a six-month term, within which they can complete as many courses as they choose for no additional cost.

C. Student support services

One of the core principles of the WGU approach is that students engaged in self-paced, CBE programs require support that is different from what traditional models typically provide. WGU's approach emphasizes a detailed, mandatory student orientation process, flexible access

³ Master's level programs also include a capstone project, which is similar to a thesis.

to academic and non-academic supports, continuous monitoring to ensure student progress, and career services that emphasize assistance for incumbent workers, as well as for job seekers.

1. Student recruitment and intake

Given the requirements of its self-paced, competency-based, online model, WGU targets “post-traditional” students, that is, older students who often have prior postsecondary experience and may be working. Much of their marketing and recruitment occurs online, but personal referrals from friends and contacts who have attended WGU are another important recruitment source. More than one-third of WGU applicants come from such referrals, and the WGU recruitment staff report that these students tend to be highly successful at the university because they understand the unique aspects of the model before enrolling.

Application and admission. Students apply to WGU through an online application, after which an enrollment counselor speaks to the student about whether the program is a good fit. According to the WGU enrollment operations manager, many of these conversations revolve around time and money. A counselor who does not believe that the student will succeed at WGU might recommend that the student explore options elsewhere.

Placement. Before acceptance, students take a readiness assessment, created by WGU, that tests academic, math, and writing skills. It also includes a readiness inventory to assess whether the student has the capacity to learn independently. A student who does not pass the assessment cannot proceed in the enrollment process. Ten to 15 percent of students either fail the assessment or do not continue in the process because they lack the required prerequisites.

Orientation. When a student completes the enrollment steps, arranges financial aid, and is two weeks away from the start of the first term, orientation modules appear in his or her online student portal. The portal displays personalized information to track and support each student’s progress through his or her program. Orientation modules address many conventional topics, such as academic expectations and college resources; but they also include components unique to WGU and the CBE approach. For example, students are required to develop a graduation plan, as well as a “20-hour study schedule,” in which the student identifies 20 hours during their typical week that they can devote to coursework. Students must successfully complete the orientation before enrolling in their first course.

2. Learner supports

Beginning during orientation and extending throughout the degree program, WGU offers two main types of learner supports: student mentors and course mentors. Every student is assigned a student mentor who provides continuous support from enrollment to graduation, helping with course planning and enrollment, answering questions, and tracking student progress. Student mentors contact students within 24 hours of enrollment, and they schedule weekly meetings with students to discuss their progress and challenges.⁴

⁴ After students reach a certain level of success, mentor meetings occur every other week.

Mentors can tailor their support based on a range of student success data provided at regular intervals by the university's institutional research team:

- **Content assessments.** Prior to most courses, students take pre-assessments that identify their skills or knowledge by competency. Student mentors receive the results of these assessments and work with students to develop study plans for each course based on their strengths and weaknesses in the topic area.
- **Risk levels.** Students are classified into risk levels based on over 1,000 indicators. These metrics gauge the student's risk of not completing a full course load in a term. They are used to prompt additional interventions from mentors.
- **Assessment reports.** Every time a student takes an assessment, mentors receive automated reports that inform them about students' progress in each course and help them further tailor their support.

Student mentors work full-time and manage a caseload of about 85 students at a time. They typically have master's degrees and industry experience, as well as some classroom teaching experience. Some student mentors also have counseling or coaching experience.

Course mentors provide students with targeted academic support for each course they take. Course mentors are similar to "instructors" in traditional college settings, but most of the course material is presented through predesigned online resources, so the course mentor's primary role is to provide tutoring and additional resources to students as needed. Each course includes a team of course mentors who share the workload, sometimes dividing tasks so that each mentor focuses on different content area or type of learning resource (for example, creating videos). Course mentors are available for individual meetings with students (via telephone, Skype, instant messaging, etc.). They also host webinars on topics students are struggling with and create additional videos to fill gaps in existing learning resources.

Unlike student mentors— with whom students are required to meet on a regular basis— students can engage course mentors based on their own needs. Course mentors provide some proactive support, reaching out to students when they start a course and if they do not pass assignments. They also reach out if the student mentor informs them that a student is struggling. Course mentors receive some course-level data on student progress to help them identify students in need, but they do not receive the same type of in-depth reports that student mentors receive. Typically, course mentors work full-time on four to five courses at a time, and most have Ph.D.'s in the course content area.

3. Career services

WGU's virtual Career and Professional Development Center provides students with a range of career supports while they are enrolled and after graduation. Students access the resources through the center's website, which is intended to mimic a "career services office" on a brick-and-mortar campus. The center is staffed by a team of five people, some with general career services backgrounds, others with specific industry experience.

The Center's services are aimed at unemployed active job seekers as well as employed students who are looking to progress in their career. For active job seekers, the center provides services such as personalized resume reviews and practice interviews, as well as monthly webinars and a weekly job club for students to discuss job searches and to support each other. For all students, there are also a host of self-service resources that students can access to explore their professional goals, career options, and job opportunities. The center also provides professional development resources to help students engage in their professional community, network with others in their field, and learn about relevant conferences and credentialing opportunities.

D. Organizational procedures and policy context

1. Accreditation

WGU is currently accredited through the Northwest Commission. As one of the first nonprofit universities to offer online, competency-based programs to students across the country, however, the university originally faced hurdles with accreditation and licensure. Of particular concern in obtaining accreditation was how to equate competency units with traditional college credits. The challenge was addressed by developing a formula for translating competency units to credits, based on the level of work and amount of activities in each course. A related challenge has arisen in obtaining licensure approval for WGU's teaching and nursing programs. Licensure decisions are made state by state, so WGU has had to work with each state to meet their respective requirements. There are other state-specific requirements that WGU has had to meet for their IT and business programs, but these areas are less regulated than education and nursing.

2. Financial aid

Financial aid can be challenging in CBE programs, in particular because federal aid is tied to credit hours and WGU's courses are structured instead around competency units. Compounding this problem is that one of the goals of CBE is to allow students the flexibility to move at their own pace through courses and degree programs. WGU has addressed this challenge by requiring that all students enroll in a full-time course load at the beginning of each term, even if they take their courses sequentially. This ensures that students can receive federal financial aid. Students work with their mentors at the beginning of each term to select courses that will allow them to progress toward a degree and that they can reasonably complete in one term. If they are able to complete more than a "full-time course load," they can do so without additional cost. If they do not complete a full course load, they must demonstrate that they made "satisfactory academic progress" in order to maintain financial aid, just as students do at any other institution.

3. Articulation

As with accreditation, one of the primary articulation challenges for CBE programs is translating "competency units" into traditional credits. The same formula is used to translate credits into competency units when students transfer into WGU and to translate competency units to credits when they transfer into other institutions.

 III. SINCLAIR COMMUNITY COLLEGE: ACCELERATE IT PROGRAM

Under the TAACCCT grant, SCC is building upon their existing Sinclair*Online* distance-learning course development and student support models and leveraging additional college services to create a complete CBE system. The effort is led from the centralized Distance Learning and Instructional Support (DLIS) division rather than from a single academic department. Still, a central component in the creation of the CBE system is SCC's revamping of the Computer Information Systems (CIS) curriculum to align with current state and industry standards. The revised curriculum consists of 31 CBE courses (23 CIS and 8 general education), which will be delivered in four modalities: self-paced online, instructor-led online, hybrid/emporium, and web-enhanced classroom. These courses will feed into four short-term certificates, four industry certifications, and three Associate of Applied Science (AAS) degrees.

The TAACCCT team is adapting a variety of college processes to support the new CBE system. They are leveraging curriculum development and student support processes to develop and deliver the CBE courses and corresponding support services, and they are retrofitting existing semester-based administrative systems to support accelerated, self-paced, rolling starts. The CBE system also implements new intake and screening processes; transitions Sinclair*Online* student coaching support to a more data-driven model; integrates career services into student coaching; and expands upon and builds new relationships with regional employers and workforce boards. The new CBE system differs from SCC's traditional system as outlined in Table III.1.

Table III.1. Comparison of SCC traditional and CBE programs

	Traditional programs	CBE programs
Curriculum	Courses based on general education, program, and course outcomes	Outcomes and competencies mapped to content and assessment items
Course delivery	Defined semester/term start and end dates	Rolling starts
	Weekly schedule based on semester calendar	Student sets schedule
	Weekly lessons	Ordered topics
	Advance weekly with class regardless of performance	Advance to next topic only after demonstrating competency
	Instructor led	Faculty mentor provides support
Student services	Central services accessed by student	Case managed by academic coach

The new CBE system provides the foundation for implementing the centerpiece of the grant-funded efforts, the Accelerate IT program, which was launched in August 2013. Accelerate IT offers fully online, self-paced, competency-based courses, supplemented by enhanced student supports. The following discussion of staffing, curriculum development, and student support services focuses on the Accelerate IT program, referring to the broader CBE system as appropriate.

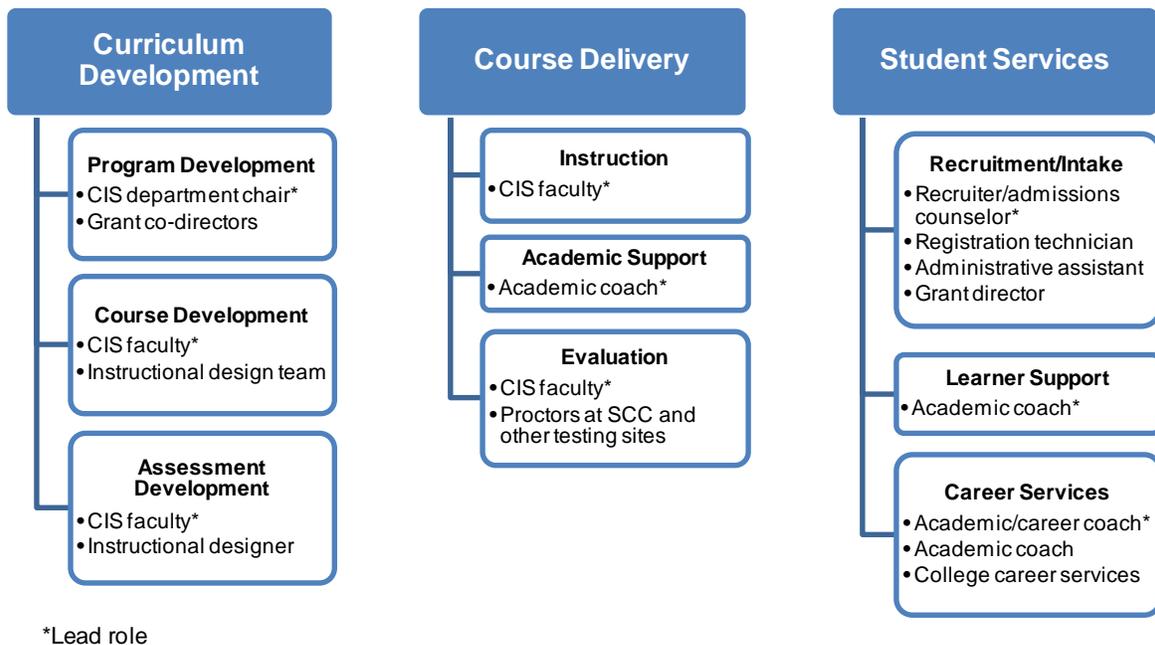
A. Staffing

SCC’s approach to staffing the Accelerate IT program builds on and is integrated with the college’s well-developed distance-learning curriculum and support models. Seven current SCC staff members were reassigned to the Accelerate IT team for between 50 and 100 percent of their respective full-time-equivalent positions. These staff include the project’s two co-directors (the DLIS dean and a former professor), the lead academic coach (a DLIS coach who was the architect of the Sinclair*Online* coaching model), the academic/career coach (a dislocated worker specialist at SCC), two instructional designers (both SCC instructional designers, both with DLIS), and the project data lead (an analyst in the SCC office of Research Analytics and Reporting). They bring knowledge and experience from previous positions to Accelerate IT; at the same time, they report to their original departments, promoting transfer of innovations and lessons learned from the grant to departmental practices. Likewise, since these staff will remain at the college at the end of the grant, SCC will retain the knowledge acquired on the project. SCC leadership views this approach as the key to the program’s sustainability.

Four additional staff positions created under the grant are being filled by external candidates: (1) project manager, (2) administrative assistant (these two are especially important since SCC is the lead college in the consortium), (3) recruiter/admissions counselor, and (4) a third academic coach. Each of these positions is fully funded by the grant.

The role of faculty in the Accelerate IT program is somewhat different from SCC’s traditional online faculty role. Faculty serve as course developers, mentors, and graders, while academic coaches monitor student performance and intervene as needed to support student progress. Figure III.1 provides an overview of SCC’s staff roles.

Figure III.1. SCC Accelerate IT staffing model



B. Curriculum development

1. Program development

As noted, the CIS faculty revamped the CIS curriculum to align with current state and industry standards to develop the Accelerate IT programs and courses. Specifically, the curriculum is based on 2013 Ohio IT standards and the newly revised Cisco Certified Network Associate (CCNA) and Microsoft Certified Solutions Associate (MCSA) industry standards. The three CIS AAS degree programs and corresponding certificates and courses were extensively updated and revised to incorporate the new standards. They were subsequently reviewed and approved through SCC's existing curriculum approval processes.

Two new short-term certificates were also created through the grant. The MCSA certificate packages the courses that support MCSA industry certification. The IT Fundamentals certificate consists of the six IT courses that are common to all CIS degree programs. The IT Fundamentals certificate provides an opportunity for undecided CIS students to earn a credential while they explore different specialty areas, and it facilitates a more informed choice about which degree specialization to pursue. The certificate also prepares students for entry-level jobs, helping them to work in the field while completing their degree.

The newly designed curriculum allows students to complete their AAS degree by completing stacked certificates and degree requirements in four phases:

- 1) IT Fundamentals certificate
- 2) Specialty area certificates (CCNA, MCSA, or Fast Track Programmer)
- 3) Internship
- 4) General education courses

2. Course development

The SCC team leveraged DLIS and Sinclair*Online* course development processes for the Accelerate IT model. The existing processes are based on a master course model that develops one set of learning materials for each online course; enforces a standard template college-wide; maps general education, program, and course outcomes to course content and assessment items; complies with Americans with Disabilities Act (ADA) requirements; and adheres to Quality Matters⁵ standards. Following this model, teams of two to three faculty work with an instructional design team to develop the CBE courses, with additional media and support services available if needed. The instructional designer serves as the project manager, guiding the faculty teams through the course development process. The instructional designer edits and approves all content. Faculty serve primarily as subject matter experts and are responsible for developing course content and assessments and approving all textbooks and other learning resources.

⁵ The Quality Matters Program is an independent peer review process which assesses and certifies the quality of online courses for subscriber institutions. See [<https://www.qualitymatters.org/>] for more information.

SCC made several modifications to the existing course development model for the CBE program. They created a more granular competency-mapping document and process to align the competencies and outcomes with specific topics, learning resources, and assessment items (see Appendix B for a sample mapping document). To support self-paced delivery, the SCC team developed a new template using topics instead of weekly lessons. The new template divides the course into four sections—syllabus, “Start Here,” “What to Do,” and “Final Steps”—to guide the student through it. Finally, they implemented selective release of content to require that students demonstrate mastery of at least 80 percent on each topic quiz before advancing to the next course topic.

SCC’s CBE course development process can be summarized in seven major steps:

- 1) Identify and map the competencies and learning objectives for the course
- 2) Create a project schedule indicating responsibilities and due dates
- 3) Identify the textbook and learning resources
- 4) Develop the CBE online course
 - a) Identify topics needed to address the competencies and objectives
 - b) Develop assignments and assessments
 - c) Create/locate learning materials
 - d) Create and populate master course and repository in the learning management system (LMS)
- 5) Map the competencies, outcomes, and objectives to course content, assignments, and assessments in the LMS
- 6) Validate coverage of competencies, outcomes, and objectives
- 7) Review course for adherence to Quality Matters standards and ADA requirements

3. Assessment development

Faculty from the course development team, who may or may not be the same faculty who develop the content, create Accelerate IT assessments. This contrasts with the WGU model, which separates the two processes. Course competencies are mapped to assessment items to ensure that all competencies are being assessed and that the items are assessed at the level of Bloom’s taxonomy appropriate for the competency. At the end of the semester, the course coordinator and faculty team teaching the particular course review assessment results across all course sections and revise and clarify items as needed.

Instructional designers, CIS faculty, and academic coaches jointly developed the Accelerate IT testing policy, which allows students unlimited attempts on low-stakes topic quizzes and up to three attempts on higher-stakes assessments (labs, midterms, and finals). Students must seek faculty permission for the second attempt. For the third attempt, the student is required to develop and receive approval for a remediation plan demonstrating how he or she will prepare for the test. A student unable to earn at least an 80 percent score after the allowable attempts has

the option to complete the course as if it were a traditional online course, and will be counseled out of the Accelerate IT program.

Security of assessments is addressed in several ways. The LMS requires login and authentication before a student can access the site. Objective assessments consist of question banks so that each student in the course can receive different questions, as can students retaking an assessment. High-stakes assessments require in-person proctoring, which can take place either on the SCC campus or another proctored testing site. Most students are expected to use SCC's testing sites for proctored exams, but students living over 60 miles from the college receive support from an online proctor coordinator. SCC is also piloting the ProctorU virtual proctoring service under the grant.

4. Course delivery

SCC's original plan was to develop only the self-paced, accelerated CBE course model used in the Accelerate IT program. However, since SCC's master content model supports delivery of a single set of course materials in multiple modalities, the team decided to leverage the high quality materials they had developed under the grant and make them available to students through the four modalities described below, each of which offers a different suite of learner supports (addressed in more detail in the section that follows).

Self-paced online. In this modality, used in the Accelerate IT program, students progress through coursework at their own pace, advancing through content as competencies are achieved. With new course starts every Monday,⁶ students can begin a new course as soon as the previous one is finished. Although students are allowed to enroll in a new course any Monday through the 12th week of the term, they are expected to complete all coursework by the end of the traditional 17-week semester. However, under college policy, an "incomplete" can be granted, which allows students an additional 30 days to complete their courses. Students are assigned an academic coach to serve as a case manager who monitors their progress, keeps them on track, and coordinates services. Weekly coaching reports allow the coach to monitor each student's progress.

Instructor-led online. Students progress through coursework on a predetermined semester schedule with the instructor-of-record monitoring progress. An academic coach supports course sections using a coaching "lite" model. Coaches contact each student twice per semester and use coaching reports to target additional interventions as needed.

⁶ SCC implemented rolling starts by scheduling 12 individual course sections, each with a different Monday start date and corresponding "flex term" section shell in the LMS. They created a single "content" shell in the LMS where all students interact with the instructor, classmates, and course materials. When the student is ready to begin a course, the academic coach manually moves the student from the flex term shell into the content shell. The flex term and content shells are used to align enrollments with conventional academic terms, but allow students to start as needed. The grant team is working with college IT staff to automate the process, which is becoming more time-consuming as enrollments increase. The automated process will synchronize the content shell with the enrollment shells to adhere to drop and census dates.

Hybrid/emporium. This model provides students at SCC’s four regional Learning Centers access to CIS program instruction. Students participate in the self-paced online courses, but are required to attend classroom sections where they can interact with a faculty facilitator, academic coach, and classmates. Coaches intervene if a student does not attend the required classroom sessions or is not making adequate progress; otherwise, students have access to the same learner supports available to other Learning Center students.

Web-enhanced classroom. Students meet with an instructor in the traditional classroom on the normal semester schedule and timeline. The instructor uses the online materials as the basis of the instruction and for the assessments. Students have access to the same supports as other SCC students.

The single-source content model has several advantages, including the cost-effective development of high quality materials that map to outcomes and competencies, easy update of courses, consistency across all sections taught by multiple faculty, and the ability to accurately and consistently measure outcomes across all sections of a single course. Table III.2 summarizes the distinctions among the four modalities and compares them to the *SinclairOnline* model.

Table III.2. SCC course delivery modalities and student supports

	CBE modalities				
	<i>SinclairOnline</i>	Accelerate IT	Instructor-led online	Web-enhanced classroom	Hybrid/emporium
Admissions counseling*		X			X
Readiness assessment		X			X
Orientation	X	X	X	X	X
Prior learning assessment counseling*		X			
Academic advising/MAP	X	X	X		
Face-to-face facilitator for tutoring/troubleshooting					X
Routine check-Ins	X <i>(twice per term)</i>	X <i>(weekly)</i>	X <i>(twice per term)</i>		
Performance/engagement interventions		X	X		X
Embedded career counseling*		X			X
Transfer assistance	X	X			X
Internship/job placement prep*		X			X

* The college maintains offices/staff for these functions where students may “self-serve,” but *SinclairOnline* coaches do not proactively facilitate these services under the coaching model.

C. Student support services

A key feature that differentiates the Accelerate IT program from Sinclair*Online* and standard SCC programs is enhanced student support services. Sinclair*Online* uses a limited case management model with academic coaches providing targeted students with traditional academic advising and check-ins twice per term. Sinclair*Online* students do not receive career counseling unless they utilize traditional campus channels available to in-person students. In contrast, the Accelerate IT program has adopted the Sinclair*Online* case management tool, Student Success Plan (SSP), which supports consistency, continuity, and transparency in the Accelerate IT student support model. However, they have expanded the model to offer a more comprehensive, latticed support framework that includes enhanced intake, comprehensive assessment, stronger relationship development, data-driven ongoing support, and embedded career counseling with a job placement focus from the point of admission. We describe these enhanced supports below.

1. Student recruitment and intake

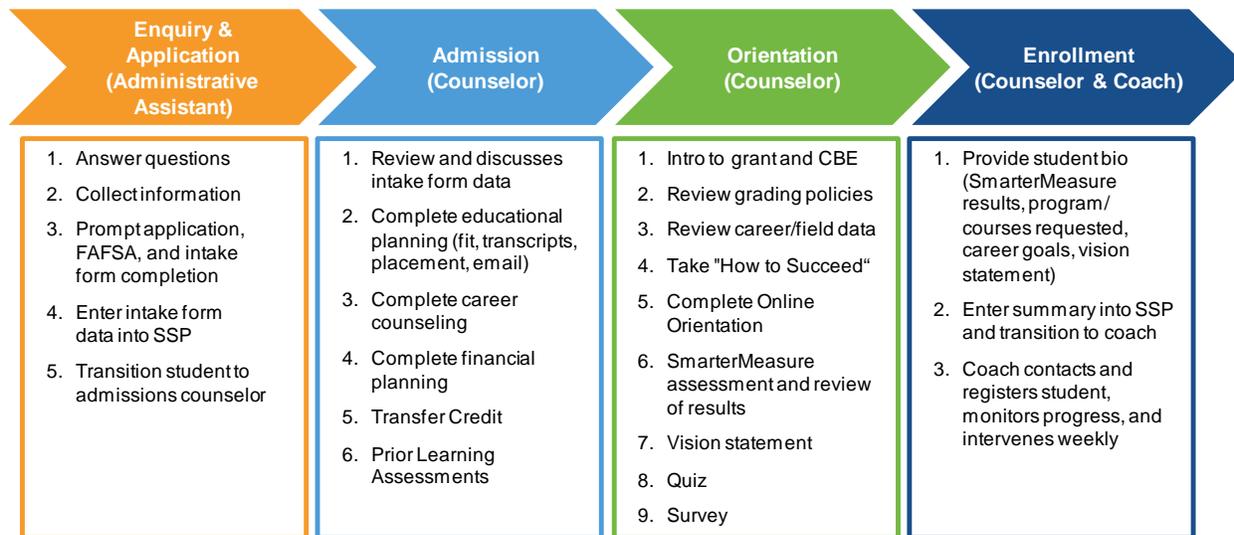
The grant team created a profile for their target population based on the student's likelihood of success. They determined that the ideal student for the self-paced, accelerated program is an adult learner who has some college, experience in the IT field, or prior CIS coursework and who has succeeded in online courses in the past. In addition, students must test into at least the second-highest (of four) levels in developmental math and reading at the college. The recruitment strategy also involves an explicit effort to target incumbent and displaced workers and veterans.

The recruiter/admissions counselor, who is responsible for bringing students into the Accelerate IT program, is supported by other grant staff in a variety of recruiting activities. The recruiter works closely with the CIS department to identify "good fit" students who are already enrolled in the traditional CIS program and would likely transition well to CBE courses. The recruiter and other grant staff visit existing CIS class meetings and participate in college recruitment events, job fairs, and community events. They work with the local Workforce Investment Board, Job Center, community agencies, SCC's Veterans Affairs office, local Air Force base education offices, and SCC's employer contacts to identify students with the appropriate characteristics. In addition to this direct outreach, students are also referred to the program by the SCC Admissions Office and Academic Advising Center. The program also runs Facebook and LinkedIn ads and created a variety of marketing materials.

Enhanced student intake is central to the Accelerate IT student support model. A limitation of the existing Sinclair*Online* model involved the assignment of student to coach *after* admission and academic placement, which resulted in some backtracking and redundancy (for example, retaking placement exams, changing majors, dropping and re-registering for courses). Under the Accelerate IT model, the admissions counselor enters the student's information into SSP upon enquiry about the program; this allows the counselor to log and track all steps from application onward and to create and share action plans for any missing steps. Since Accelerate IT coaches can view SSP entries from the intake process, the transition from admissions counselor to coach is smoother.

Accelerate IT students are guided through four basic steps as they transition from initial inquiry to enrollment. Figure III.2 summarizes the key steps, noting the team member responsible for each.

Figure III.2. SCC Accelerate IT student intake process



2. Learner supports

After handoff from the admissions counselor, three full-time academic coaches⁷ are responsible for supporting and guiding students through the Accelerate IT program. Initial coaching meetings (in-person or virtual) involve transitioning vision statements into concrete goals, shepherding students through course selection and projecting course completion, creating an academic plan (MAP), and registering the student for classes. In addition, coach and student review program-specific policies, faculty and coach roles, and mutual expectations of student and coach in what is known as the “coaching agreement” (see Appendix C).

Coaches check in with students weekly or biweekly to discuss progress, challenges, and successes. Guiding these check-ins are progress reports delivered to coaches weekly, which contain data derived directly from the LMS. The reports track student log-ins, assignment submission, examination grades, course progress, and course grades, and they prioritize for intervention any students who exhibit high-risk behaviors. Coaches also work with faculty to troubleshoot student performance issues and to support students consistently.

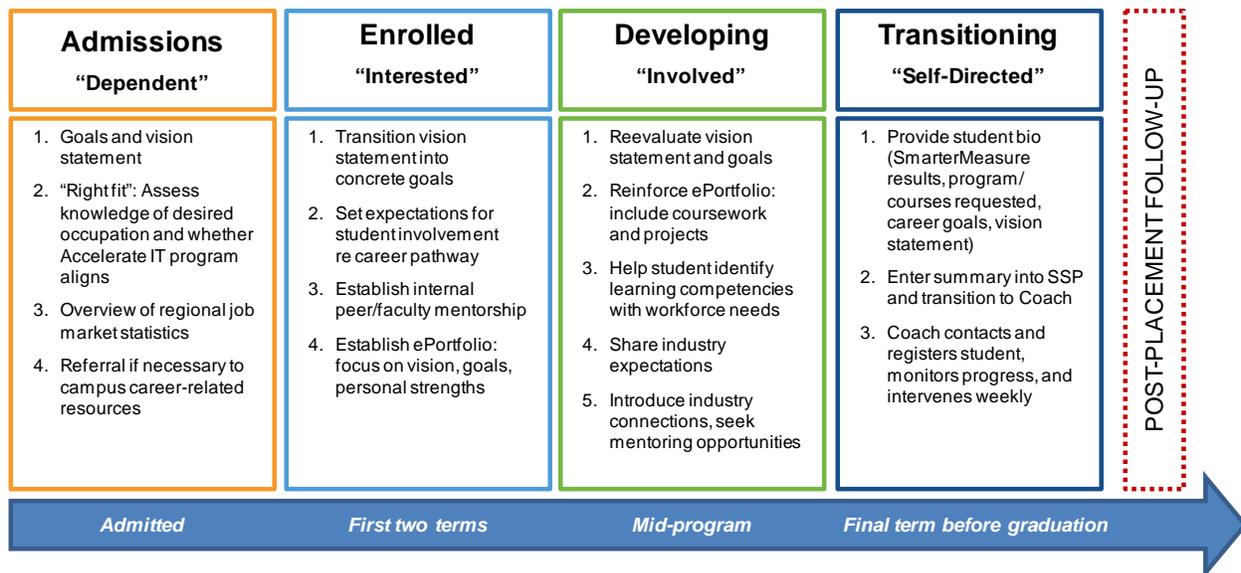
3. Career services

As students move through the Accelerate IT program and make progress through gatekeeper courses, the academic coach provides targeted career or transfer counseling based on the student’s individual needs. Enrollment in key courses triggers the “internship conversation,” in which the coach encourages participation in internship programs and provides information and

⁷ The three positions are slightly different: one serves as lead academic coach, another as academic/career coach, and the third as academic coach/financial aid specialist.

resources to get started. Students tracked for university transfer are provided information and resources on articulation with four-year institutions. MAPs and degree audits are routinely monitored, and as a student nears completion, the coach encourages the student to leverage SCC and local resources for job placement. Figure III.3 depicts SCC’s career development approach.

Figure III.3. SCC Accelerate IT career advising model



The grant team views the relationships that the academic/career coach has established with the SCC internship coordinator and the local workforce boards as an integral piece of their career coaching model. SCC’s internship coordinator is extending services to the Accelerate IT students, which include career readiness training in addition to placement and oversight of internships. The academic/career coach also spends 15 hours each week at the Montgomery County Job Center establishing and building relationships that might serve students entering the job market.

The Accelerate IT career coaching process differs from other programs at SCC in that it embeds career counseling throughout the student’s progression through the program. In addition to the embedded coaching, students are referred to SCC’s Career Services department as needed, and they have full access to SCC’s “Career Coach” online services.

D. Organizational procedures and policy context

1. Accreditation

SCC is currently accredited by the Higher Learning Commission (HLC), which recently released guidelines regarding CBE programs.⁸ HLC determined that the Accelerate IT program is covered under SCC’s existing accreditation of asynchronous distance-learning programs, so the college did not have to seek further approval.

⁸ HLC guidelines are at: [http://www.ncahlc.org/Monitoring/direct-assessment-competency-based-programs.html].

2. Financial aid

SCC's academic coaches have worked with the WGU and Sinclair financial aid offices to establish guidelines and processes for Accelerate IT students. The financial aid process has been fully implemented to support rolling starts, as long as students enroll for a full course load at the beginning of the term. By doing so, students receive the appropriate amount of aid for the full term, even if they complete their CBE courses one at a time. The SCC financial aid office has identified a staff member to support the academic coaches as they work with the program's students, and one of the academic coaches also serves as the grant team's financial aid specialist.

Grant staff also work with Veterans Affairs and SCC's financial aid office to coordinate GI Bill benefits. GI Bill regulations result in reduction of the living expenses benefit when veterans complete courses one at a time. This is likely to push some veterans away from Accelerate IT and into the instructor-led or web-enhanced classroom modalities.

3. Articulation

SCC's CIS program currently has articulation agreements with three local regional universities: Wright State University, Ohio University, and Franklin University. These will be maintained for students completing the Accelerate IT program. SCC is working to create articulation agreements with WGU and the University of Cincinnati.

E. Scale-up and expanding enrollment

The SCC team approached the development of the CBE system with scale and sustainability in mind. The master course model, along with tailored support approaches, allows SCC to offer the four modalities described in the Course Delivery section of this report without expending significant additional resources. At the same time, these multiple modalities will help boost the enrollment of students with different needs and preferences. As more processes are automated, capacity to serve students will increase further still.

SCC is developing a "Stakeholder Collaborative Framework" as another means to scale and sustain the new CBE system. The framework reflects the TAACCCT program's employment-focused perspective on education and provides a foundation to ensure that the college's CBE curricula are based on a thorough and accurate understanding of the skills needed for employment in a given industry. It offers a method and tools for engaging key stakeholders—including representatives from units within SCC, community organizations, employers, and workforce agencies—to collaborate on workforce and economic development. The structured, time-based approach starts by engaging individuals, then groups, around incumbent, emerging, and future workforce trends, as well as disruptors. When successful, the process results in precise job descriptions, staffing plans, and ultimately regional workforce development plans. By helping to ensure that SCC is educating students for good jobs in the region, grant leadership believes the framework will be part of a virtuous circle to scale the CBE system to more students and to sustain it over time.

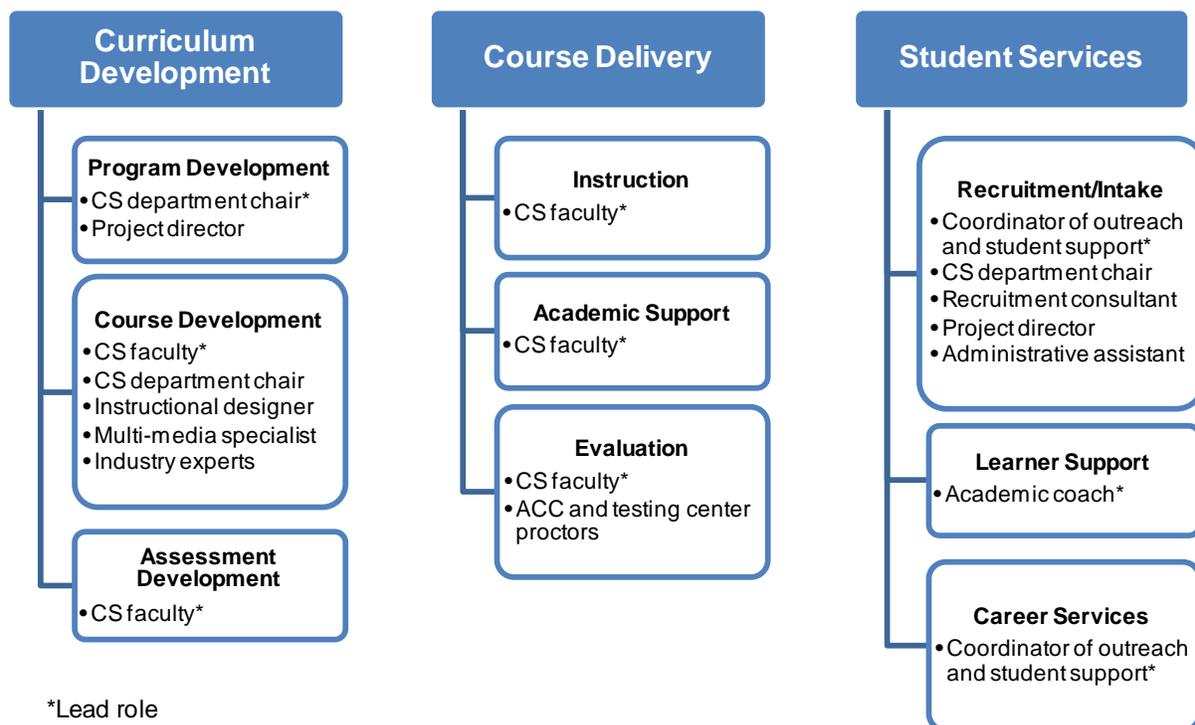
IV. AUSTIN COMMUNITY COLLEGE: ACCELERATED PROGRAMMER TRAINING

Under the consortium's grant, ACC is developing and implementing the Accelerated Programmer Training (APT) program, an alternative route to a set of stacked and latticed computer studies credentials through a package of 26 self-paced CBE courses. Most of the APT courses will be fully online, but a few will be hybrid courses, that combine online and in-person interaction. ACC offered the first set of APT courses in September 2013. ACC is also using TAACCCT funds to develop new services to support APT students from program intake to job placement.

A. Staffing

Austin's APT model places great responsibility on Computer Studies (CS) department faculty, including the chair. However, their model has evolved over time to include roles that were not initially planned. In particular, the academic coaching role was not part of the college's original plan, but was added as the program developed and it became clear that more proactive student supports would be important. The college had always planned to dedicate resources to student recruitment, but the role has expanded with pressure to increase enrollment. Figure IV.1 summarizes the APT staff roles.

Figure IV.1. ACC Accelerated Programmer Training staffing model



B. Curriculum development

1. Program development

ACC is not using grant funds to create entirely new programs. Rather, the CS department is working to adapt parts of their existing curriculum to be self-paced and competency based, offering students an alternative route to the existing credentials. In total, they plan to revamp 26 of the department's courses, which will apply for students pursuing several computer studies credentials: the C++, Java, and Database certificates; the NetPlus and A+ certifications; and the AAS in Computer Programming and Computer Programming with Web Programming Specialization. The APT certificate and certification tracks will consist entirely of CBE courses. Similarly, the computer studies courses required for the AAS degrees will also be competency based; but degree-seeking students with general education requirements will need to take those courses through existing brick-and-mortar or distance-learning sections.

ACC has also used grant funds to develop a new "Marketable Skills Award,"⁹ which includes four introductory courses related to programming and computer hardware. The rationale for the new award was that it would provide students with a concrete, cohesive set of skills that could help them access internships and jobs, even if they are still working on another certificate or degree.

2. Course development

Under the grant, ACC faculty take the lead in designing the courses they will be teaching. They receive assistance from the APT course development team, which includes the chair of the CS department, all the faculty who teach APT courses, an instructional designer, and a multi-media specialist.¹⁰ During the course development process, team members can access the *APT Course Development Guidelines*, which were prepared by the instructional designer and provide best practices related to course development.

For each course, faculty instructors define higher-level competencies and corresponding specific learning objectives. The competencies are developed based on the learning outcomes from existing courses and industry certification requirements (derived from the Computing Technology Industry Association, or CompTIA, exams). Competencies are also derived from job descriptions, labor reports, and information from the Chamber of Commerce. Each competency is accompanied by detailed learning objectives that are defined by faculty with input from industry experts.

The course development guidelines advise that instructors articulate competencies and learning objectives that are as precise and measurable as possible. Toward that end, they suggest using action verbs from Bloom's taxonomy. For example, instead of aiming for students to "learn" a given concept, faculty can specify that students should "define," "recognize," or "classify." Bloom's taxonomy is also used to define learning outcomes for traditional courses at ACC, and the CS department chair reported that this approach results in more measurable objectives.

⁹ Computer studies students not enrolled in APT courses can also earn the Marketable Skills Award.

¹⁰ The instructional designer and multi-media specialist are supported full-time with TAACCCT grant funds.

After outlining the course structure, faculty must compile learning resources. They can opt to work with a multi-media specialist who was hired full-time to help them create learning resources, such as videos and other online materials. All course materials, including the syllabus, course schedule, competency modules, assignments, assessments, discussions, and learning resources, are organized and stored in an online course template. The template is consistent across all APT courses and serves as a platform for students to access course materials. Program leaders sought to apply a consistent template across courses so that students would be comfortable with the “look and feel” of the materials and would not have to learn a new platform for every new course.

Prior to initial rollout, all courses are peer-reviewed by the course development team. The faculty member who designed the course presents it to the team, and the team uses an evaluation rubric to highlight areas for improvement. After a course is introduced, faculty will continually update the course competencies and learning objectives based on feedback from surveys with industry partners about technology changes and new competencies that are required for employment in the field. At the end of each semester, faculty will receive data from Blackboard on how students utilize course materials.

The course development process for APT courses is somewhat different from the process for developing traditional computer studies courses at ACC. Traditional course instructors start by identifying learning outcomes, which are typically less distinct than the competencies identified for APT courses. Once desired outcomes are defined, the instructor identifies a textbook that is aligned with those outcomes. Faculty who teach these courses receive input from a five-person sub-committee of the computer studies taskforce, but they do not have access to an instructional designer or multi-media specialist to help them structure the course or develop course materials. Since most materials in traditional courses are delivered in person, there is not a common template, but materials are sometimes posted to the Blackboard LMS.

3. Assessment development

In addition to adapting curricula to be competency based, faculty are also adapting course assessments. The instructor for each course develops the assessments by adapting existing test items from traditional courses, borrowing test items from certification exams, and creating new items aligned with the competencies. All APT assessments are either objectively scored (for example, multiple choice) or are projects (for example, writing computer programs). Students must take objectively scored tests in approved testing centers, either on the ACC campus or, for students who live outside the Austin area, in a remote location. To ensure security, students must use testing center computers for the assessments, and all tests are proctored in person.¹¹ These assessments are submitted through Blackboard and are automatically graded by the “Respondus” tool used with the LMS. The projects are completed in computer labs and are graded by the instructor for the course.

¹¹ ACC is exploring the option of online proctoring college-wide, but this is not currently in place.

As part of the peer-review process described above, the course development team reviews assessments for each course prior to its rollout. This review focuses on the types of assessments and feedback that will be provided to the student, and it aims to ensure that assessments are aligned with course content.

4. Course delivery

ACC's policy on APT course starts is still evolving, but the program's courses are currently aligned with ACC's 16-, 12- and 8-week sessions. There is some flexibility, however, insofar as students themselves can begin and end the course any time after it has started. This differs from ACC's existing distance-learning courses, which have fixed start and end dates. Eighty to 90 percent of APT courses will be fully online and asynchronous (that is, with students accessing materials at their own convenience); 10 to 20 percent will be hybrid courses that offer some content online and some in person. The same computer studies faculty member that is the instructor of record for the course is also responsible for grading assignments and assessments.

C. Student support services

APT students have access to a range of new support services developed under the grant. Applicants are tracked in a new intake process from the initial point of inquiry to enrollment. Once enrolled, they will receive ongoing support from an academic coach to help ensure timely progress through the program. When students are ready for internships or placement in full-time jobs, APT students will have access to assistance that is tailored to their career interests and supported by extensive industry partnerships developed through the grant.

1. Student recruitment and intake

The APT recruitment and intake activities are distinct from other departmental or college-wide procedures. Recruitment is conducted primarily by an adjunct faculty member who serves as the coordinator of outreach and student support, along with a part-time consultant hired to help recruit students and industry partners. To date, marketing and recruitment efforts have included posters, a program website, information letters, and a Google group. A key part of the recruitment efforts has involved community partnerships with organizations such as Veterans Affairs, the Texas Veterans Commission, the Texas Workforce Commission, and the Round Rock Chamber of Commerce. These organizations were chosen so that APT could reach its target student population of veterans and TAA-eligible workers.

Once students express interest in the program, they enter the APT intake process. As with the traditional computer studies programs at ACC, students first apply to the program, complete an intake form, and must pass the state's "Texas Success Initiative" (TSI) math test.¹² After completing these steps, APT applicants take several other steps that are not required in traditional programs. The APT project director described these as "intentional hurdles," designed to ensure that students are prepared for and committed to the program:

¹² Students who are veterans or who have bachelor's or graduate degrees are exempt from the TSI test. Students who do not pass the math test are referred to developmental education before enrolling in the program.

- **SmarterMeasure assessment.** First, the student takes the SmarterMeasure Online Learning Readiness Assessment,¹³ a web-based tool that indicates a student's likelihood of success in an online environment.
- **Student support interview.** The student is then interviewed by the coordinator of outreach and student support, who discusses the results of the SmarterMeasure assessment and the student's preparedness for the program. One of the key issues covered in this interview is the student's ability to manage the course load along with other work and personal commitments.
- **Department chair interview.** The student then interviews with the department chair, who discusses the student's goals and course selection.
- **Prior learning assessment.** A student who has prior learning or work experience relevant to the program can choose to take a "challenge test" administered by the department chair to place out of required entry-level coursework.

After completing this process, the department chair will either enroll the student in the APT program or refer the student to another program or learning path.

2. Learner supports

APT students will have access to more proactive and involved academic coaching than the counseling provided to students in traditional ACC computer studies programs. In contrast to the college's counselors, whom students must seek out on their own, the APT academic coach contacts all students at the beginning of their first term, ideally during the first week of classes. At that time, the coach and the student agree on a schedule of weekly or biweekly email or phone contacts. During these weekly contacts, they discuss course progress and plans for future course enrollment.

The APT coaching program started off slowly in the first term when courses were offered (Fall 2013), in part because the management team did not originally plan or budget for coaching in the grant application. They decided to add this component to the program during the first year of the grant after learning from WGU about the importance of learner supports and communicating with the other consortium colleges about their plans for learner supports. During the first term of courses, one person served as a coach, devoting half time to coaching and half time to an administrative role in the CS department. During the second term that APT courses were offered, program leadership hired an additional coach, who is supported full-time by the grant.

Even with full coaching resources in place, program leadership notes that there are apt to be some limitations to the support that the APT coaches can provide. In contrast to the WGU model, the ACC coach does not have access to course grades or data on student progress in courses, and

¹³ The colleges are all currently implementing SmarterMeasure, an assessment that seeks to measure "a student's levels of readiness to take an online or technology-rich course." It includes components for individual attributes (motivation, procrastination, willingness to ask for help, etc.), life factors, learning styles, technical competency, technical knowledge, on-screen reading rate and recall, and typing speed and accuracy. See [<http://www.smartermeasure.com/>].

there is little contact between the coach and instructors. Still, the coach can ask students about their progress and provide targeted support, while instructors monitor academic progress.

3. Career services

ACC has heavily emphasized employer involvement in the APT program, which is intended to bolster students' career opportunities. APT students have access to career services and job placement assistance that are more comprehensive and targeted than what is available to other ACC students. ACC has a college-wide career services office with a job-posting board that all students can use, but it requires that employers submit jobs for posting and that students access it. In contrast, the APT coordinator of outreach and student support is proactively developing industry partnerships and serves as a liaison between students and employers. By the first term of the program, he had established relationships with hiring managers at more than 50 companies in the IT field. The part-time consultant who helped recruit students has also been involved in recruiting industry partners, who are featured on the program website. During each academic term, the coordinator will manage a virtual job fair so that potential employers can advertise open positions to students.

The APT team has specific plans for expanding career services as more students progress through the program. They have recently hired a job placement specialist and plan to hire retired industry executives as part-time staff; they will also publish a monthly newsletter that lists openings for internships and jobs. Over time, the coordinator of outreach and student support will increase the amount of time he devotes to career services, eventually serving in the role full-time. Similarly, after course development is complete, the multi-media specialist will redirect time to working with students to produce "personal statements" that serve as part of the student's online portfolio. These portfolios will be hosted on the APT website and will be searchable by specialization. Employer partners will have exclusive access to all newly listed online portfolios for one week before the portfolio is available on the APT public site.

D. Organizational procedures and policy context

1. Accreditation

Because the APT program is focused on adapting existing ACC courses to self-paced, competency-based formats and offering alternative routes to existing credentials, the APT program did not have to go through any additional accreditation process. All the new courses are assigned the same course numbers as their traditional-format counterparts. The dean and department chair have met with the Texas Higher Education Coordinating Board (THECB), and the APT sections of the courses offered will be tracked as competency based, which will allow THECB to track the student progress and retention in CBE sections. APT leadership is also meeting with their accrediting body, the Southern Association of Colleges and Schools (SACS) to "stay ahead of the curve" as SACS is considering new requirements for CBE programs.

2. Financial aid

As with accreditation, the APT program did not have to develop new financial aid procedures or get new approvals, because courses and credentials were being *adapted* rather than *created*. About 9 percent of APT's fall 2013 enrollments received Pell grants, but many of the students who enrolled did not apply for federal financial aid, because they already had bachelor's

or master's degrees. Unlike at WGU, students in the APT program are permitted to sign up for one course at a time rather than a full-time course load at the beginning of the term. APT staff anticipate that some issues could arise if students choose to do this. Enrolling in one course at a time may make sense in the context of intense CBE courses, but it may mean that the college's financial aid office classifies such students as part-time and determines financial aid eligibility accordingly. APT staff are currently working with the financial aid office to try to defer enrollment status determinations until the middle of the term.

3. Articulation

ACC already has an articulation plan with WGU in place, which allows students to transfer credit to WGU easily.

E. Scale-up and expanding enrollment

To scale up and address the challenge of increasing enrollment, ACC will focus on creating new certificates and broadening the program's marketing strategy. ACC will create two or three new certificates for the APT program: software testing, technical support, and possibly networking. This will require the creation of a few additional courses not originally planned for the grant, as well as the hiring of new adjunct faculty by fall 2014. A central approach to broaden their marketing strategy will include alignment of marketing for the Java certificate program with the college's continuing education division so that some of the over-enrollment of that program will be steered toward the APT program. To further support recruitment, Austin is going to work with the Austin Area Research Organization (AERO), an industry organization that identifies people with some college to re-engage them in credential completion. They are also developing radio marketing materials and creating a series of marketing videos for each certificate program, which will be sponsored by businesses. To maintain this level of effort, the program has obtained approval to use grant funds to hire more marketing staff as well as additional career services staff, ideally including former leaders from the IT industry.

This page has been left blank for double-sided copying.

V. BROWARD COLLEGE: COMPUTER SYSTEMS SPECIALIST CBE PROGRAM

The Computer Science and Engineering (CSE) department at BC is adapting their computer systems specialist (CSS) program to a completely online, accelerated, CBE mode of delivery.¹⁴ The program will offer 21 courses, including 7 in general education, which can lead to one or both of two stackable certificates: Information Technology Support Specialist and Information Technology Analyst. These certificates can articulate with one of several Associate of Science degrees in computer science. The program also prepares the student for nine industry-acknowledged certification exams. It is designed such that students progress through the defined sequence one course at a time.

In addition to the CBE courses, BC is using grant funds to create an open-source virtual lab that will enable online students to connect to the same campus equipment available to on-campus students. The grant is also supporting a modification of the student intake process in the CSE department, as well as the creation of additional supports for CSE students enrolled in CBE courses.

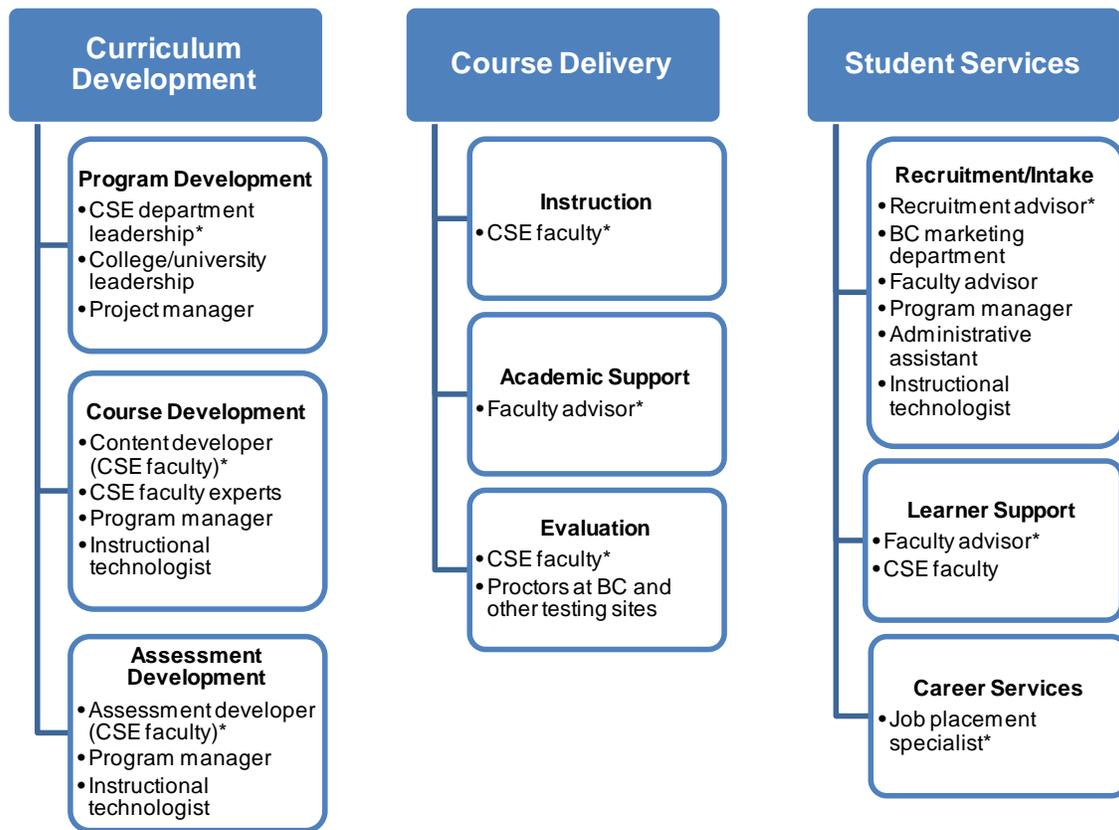
A. Staffing

BC's approach to staffing its adaptation and adoption of the CBE model is distinguished, in particular, by its heavy reliance on the CSE faculty, who, in different roles, are responsible for most curriculum development and student support activities. Working in teams, faculty members develop either content or assessments. Faculty content and assessment developers are subject matter experts who bring experience in teaching and industry to the courses they develop. As at WGU, assessment development is separated from course development; faculty have the opportunity to engage in both, but for different courses. Faculty advisors, who are also CSE faculty, play the key student support role. BC's program manager¹⁵ was also a CSE faculty member prior to taking on the coordinator role. Figure V.1 provides an overview of Broward's CBE staffing model.

¹⁴ The program did not focus on acceleration in the first term and found that students were not progressing at a pace any different from that of a traditional course. BC is adapting their program focus going forward to emphasize the accelerated pace of the program.

¹⁵ BC experienced turnover in the program manager position during the first year of the grant. Both individuals to hold the position had also served in a faculty role at the college.

Figure V.1. Broward College CBE program staffing model



*Lead role

B. Curriculum development

1. Program and course development

BC is following a five-step curriculum development process to adapt the existing face-to-face courses to a CBE delivery model:

- 1) The first step is the **identification and definition of program-level competencies**. In the case of the TAACCCT-funded CBE, program-level competencies were drawn from the Florida Department of Education and were reflected in the competencies addressed in existing outlines for the courses being adapted for the accelerated, CBE model. The outlines define specific learning outcomes that align with the state standards.
- 2) The second step is the **creation of content and assessment development teams**. These teams are selected by the Associate Dean of CSE for the computer courses, and by the Dean of Academic Affairs for the general education courses. Each team developing computer science courses consists of two faculty content developers and one faculty assessment developer. Each team developing the general education courses consists of one content and one assessment developer.

- 3) The third step is a **review of the course outlines and learning objectives** to ensure that all the developers have a common understanding of the learning objectives when creating the content and assessments for the course. With the exception of a few older courses, most of BC's course outlines fit well with the CBE model and learning outcomes, and did not require major revision.
- 4) The fourth step in the process is the **creation of the course in the college's LMS, Desire2Learn (D2L)**. Program leadership hired an instructional technologist¹⁶ to help build and develop the technical components of each grant-funded course. Each course is built using the same D2L template, so that all courses have the same look and feel. However, each course is tailored with unique learning resources, including some open-source and original content. BC leadership reports that this consistency promotes acceleration because students will not need to acclimate themselves to a new D2L course shell every time they take a new course. Each course also has a Pace Chart, which recommends the amount of time it should take to complete the course, with options for slower or quicker paces.
- 5) The fifth and final step of the development process is **quality assurance review**. BC uses Quality Matters reviewers to assess courses following a specified rubric. In particular, reviewers examine the course structure in D2L, course content and evaluations, and the release conditions for each unit of the course.

The course development process for the CBE courses is largely the same as that used for traditional courses at the college. The major distinctions are the consistent course template in D2L and the separation of course and assessment developers, which we describe below.

2. Assessment development

Assessment developers are responsible for creating the assessments that are used in each course. All BC assessments use original content (that is, they do not come from publishers). Faculty involved in CBE assessment development received training from WGU that helped them to design assessments appropriate for the self-paced, CBE approach. As is also the case at WGU, course development and assessment are independent processes at BC. In fact, course and assessment development teams do not have access to each other's shells on the D2L site. This is intended to ensure the validation of assessments to competencies, rather than to learning resources; conversely, it ensures that learning resources are identified or created to address those same competencies, rather than to address the assessments.

Broward's CBE courses use a series of assessments for students to demonstrate mastery of the required competencies. Each course begins with an "assessment challenge." Students can opt out of taking the challenge, but those who do take it and pass with a score of 81 percent or better can proceed directly to the unit evaluation. Those who do not take the challenge or who do not pass it are allowed access to subsequent labs, assignments, and module assessments for that unit to prepare themselves for the unit evaluation. Students must receive a score of at least 81 percent to pass the course and move to the next unit. Students are allowed three attempts for each unit

¹⁶ The instructional technologist, fully funded by the grant, also serves as the program website manager and manages SmarterMeasure.

evaluation and must have approval of both the course instructor and the faculty advisor to schedule the second and third attempts.

Initially, BC planned to have grading of assessments done by a course grader, separate from the course instructor, as at WGU. However, they have eliminated the grader role and will instead use the course instructors. Instructors will receive training and ongoing quality assurance checks to ensure consistency in grading based on course rubrics. Instructors have three days to grade assessments.

All unit assessments and those for a final grade must be completed in a proctored environment. Currently, students must go to a regionally accredited testing center to complete their final assessment. Module assessments and evaluations within the course are for practice only. BC is hoping to create an online proctored environment in future years of the grant.

3. Course delivery

As noted, Broward's CBE courses are delivered fully online, with a CSE faculty member as the instructor of record. Students are allowed to take only one class at a time and may enroll in a new course any Monday during the first 12 weeks of the fall and winter terms, or any Monday during the first 8 weeks of the summer term.

4. Virtual lab

The primary goal of BC's grant-funded "virtual lab" is to provide a traditional desktop infrastructure virtually so that students taking classes remotely can have the same access to resources as on-campus students. The virtual lab will provide a remote virtualization experience for more advanced computer and networking courses that provide capabilities beyond a traditional remote desktop. For example, access to complex networking environments and the ability to take snapshots of a computer's working configurations are currently available only to students in a classroom setting at BC. BC intends to beta-test the lab over the summer and to be live by fall 2014. The virtual lab will be completely open-source.

C. Student support services

As with curriculum development, BC's approach to student supports relies heavily on CSE faculty, who play a key role as advisors. Other central components to the BC approach include enhancements to recruiting and job placement that have been implemented as part of the grant-funded program.

1. Student recruitment and intake

BC identified a CBE target audience of veterans, WorkForce One referrals, college-ready adults, and certain high-achieving, college-ready high school students. Students can transfer credits in, but they must have at least 11 courses remaining in their degree to enroll in the program.

Marketing. The CBE recruitment advisor¹⁷ worked with BC's internal marketing staff to develop a plan for the program to reach targeted students. The plan employs several modes of outreach, including traditional mailers, fliers posted in key locations (such as the WorkForce One Board and veterans' offices), and an email campaign advertising the program. In addition, the initial recruiting effort employed robo-calls to 10,000 area students who took the ACT or SAT. The BC website also has an advertisement that links to the program's website and Facebook page.

Application and admission. The intake process is a combined effort of the recruitment advisor, program administrative staff, and the student's faculty advisor (described in greater detail below). Upon expressing interest in the CBE program, students speak with the program recruiter who meets with students and helps guide them through the process. Access to the program will be limited—students apply and must be accepted before they can move forward.¹⁸ Applicants must complete the SmarterMeasure assessment, which helps both the student and the recruiter determine whether the CBE program is a good fit.

Orientation, placement, and enrollment. Once accepted into the program, a student is assigned a faculty advisor. After initial contact with their faculty advisor and completion of the orientation to the competency-based program for D2L, students are registered for their first class. Once students finish one course, they can enroll in the next any time during the first 12 weeks of the fall and winter terms or the first 8 weeks of the summer term.

2. Learner supports

The cornerstone of the CBE program's student supports, and a key difference versus the traditional CSS program at BC, is enhanced faculty advising. During the intake process, students are assigned to one of four computer science faculty members.¹⁹ The faculty advisor's primary responsibilities under the grant-funded program include welcoming and introducing students to the program, monitoring their academic progress, and communicating with each student every week to address issues as they arise. This person is distinct from the student's advisor in a traditional CSS program, whose role would typically be limited to helping students select courses each term. These faculty advisors are also distinct from the course instructors.

To support faculty advisors and to ensure a consistent experience for students, CBE program staff created a faculty advising handbook that provides background about the program as well as scripts to use during the various conversations with students that occur during the intake process.

¹⁷ BC has seen turnover in the recruiter position. The first individual hired, whose experience was primarily at a career college, was recently replaced with a new recruiter who has over 10 years of experience in recruiting and career services. This person also serves as the job placement specialist.

¹⁸ In the first term in which CBE classes were offered (fall 2013), BC accepted any student into the program. With the term beginning in January 2014, they are implementing SmarterMeasure to ensure that the students who apply to the program are ready to learn in an online, accelerated environment. For students who are not ready for online courses, the college provides some pre-admission resources that can help them prepare for online learning. A student who is still not ready after accessing these resources will be counseled toward traditional face-to-face courses.

¹⁹ The faculty advisors are partially funded by the grant.

These conversations typically include (1) an initial degree audit and goal-setting conversation, (2) review of the coaching agreement, and (3) an enrollment discussion. After these meetings, faculty advisors communicate with students weekly and intervene as necessary, addressing difficulties directly or referring students to appropriate support services.

In the spirit of the TAACCCT program's emphasis on data-driven continuous improvement, BC is also creating advising tools, which will use analytics from the D2L system to support more proactive treatment of student issues. The tools are still in development but will rely on the D2L "E-associate" role to allow the faculty advisor to retrieve information about student progress for use in coaching and mentoring sessions.

BC is also planning to implement a "withdrawal intervention team," similar to WGU's approach. The idea is to create a process to identify students who stop participating in their courses. This will allow program leaders to implement a series of supportive interventions to help the student persist in the program. At this writing, the development of this team is in its early stages.

3. Career services

In addition to the career services provided to all students at BC, students in the CBE program will receive the support of a job placement specialist.²⁰ Program leaders are still creating specific supports, but the intention is for the career support process to be initiated when students hit a particular milestone in their coursework, such as when a student has four classes remaining to degree completion or upon completion of a certification en route to the associate's degree. When students hit the critical point, they will be contacted by the placement specialist who will provide career and job placement services.

BC plans to build relationships with industry partners both to help advertise the program and to create job opportunities for students upon degree completion. They are seeking to set up a process similar to the ACC approach, whereby companies agree to interview graduates of the CBE program in exchange for advertising on the program website. The placement specialist and project manager for the TAACCCT grant are beginning the process of industry outreach in early 2014.

D. Organizational procedures and policy context

1. Accreditation

BC completed their college-wide accreditation process through SACS in the fall of 2013. Because the CBE program is adapting existing courses, they did not need to seek additional accreditation.

2. Financial aid

BC created "out-of-sync" sessions to allow students to receive financial aid while enrolled in CBE courses. For traditional courses, BC has four sessions each term when students can enroll: S1 (a 16-week term), S2 (12-week term), S3 (first 8-week term), and S4 (second 8-week terms).

²⁰ This individual also serves as the recruiter for the CBE program.

The out-of-sync session does not conform to this model, but instead allows the school to disburse financial aid amounts within each CBE session, appropriate to the student's course load and progress. The associate director of financial services, an information analyst in financial services, and the associate registrar were instrumental in helping the grant team set up this new process within the college's current system. It minimizes manual work and automates processes for managing, maintaining, and tracking student financial aid, attendance, and grading, as well as payroll integration for CBE instructors. This process is being implemented during the winter 2014 term.²¹

3. Articulation

BC plans to develop articulation agreements with WGU and to piggy-back on existing articulation agreements with other Florida schools, but they have not yet started this process.

E. Scale-up and expanding enrollment

To increase the number of participants in the grant-funded courses, program leadership is considering opening the general education courses created for the CBE program to all students at BC. They are encountering a challenge, however, in the way courses are graded. All CBE courses use a satisfactory/unsatisfactory grading system, but require that students pass assessments with a grade of 81 percent or higher; all other general education classes use a traditional A-F grading system. This issue must be resolved before the program can expand enrollment in this manner.

²¹ The aeronautics department has an approach similar to the out-of-sync model, but for the most part, this is a new process for the college.

This page has been left blank for double-sided copying.

VI. INTEGRATIVE ANALYSIS AND CONCLUSIONS

This chapter presents findings from the early implementation of the TAACCCT grant across the partner colleges. We begin by comparing and contrasting the colleges' approaches, highlighting areas of convergence and distinction across the models. We then describe the colleges' progress on key implementation indicators and student participation outcomes. We go on to discuss lessons learned from the project and conclude with an overview of next steps for the project and for the evaluation.

A. Cross-college analysis of program models

Looking across the colleges' CBE models, there is substantial agreement on key principles, accompanied by a convergence of approaches in a few areas. At the same time, however, several areas of distinction emerge between the partner colleges' approaches, which also contrast with the WGU model.

1. Areas of convergence

Leveraging existing competencies and curriculum processes. Two of the key principles of CBE, as articulated by WGU leadership and outlined in Chapter I, focus on the identification and validation of robust, job-relevant competencies. The partner colleges have benefited from having in place mature processes that support the identification and validation of such competencies. As one college leader noted, the particular IT programs and courses that consortium colleges are adapting to the CBE model were already well suited for it, because the program and course objectives were already well articulated and linked to job requirements. This appears to be driven, at least in part, by the fact that all three colleges are adapting industry certification programs, where curricula correspond to explicit industry certification requirements. Similar to the way that the consortium colleges have been able to adapt existing learning objectives to the CBE model, each college also has a relatively mature curriculum development process that is being adapted for mapping program and course competencies. If, as the colleges seek to scale up their programs and expand their enrollments, they begin to develop entirely new CBE programs—especially if they are not tied to industry certification—they may find that more effort is required to ensure that competencies are robust and job-relevant.

Enhancing learning resources and assessments. Two additional principles of CBE address the quality and availability of learning resources and the security and reliability of assessments. All three consortium colleges appear to have a similar understanding of these principles. All have conducted a scan of learning resources and assessments to identify gaps in addressing specific competencies. They are supplementing the textbooks, tests, and other materials available in standard online and face-to-face courses with open educational resources, as well as custom-made videos and other materials, which they are making available through their respective LMS. They are also revising assessments to ensure that they align with course competencies, though only BC is explicitly following the WGU model and separating assessment development from course development. SCC separates course and assessment development based on decisions of the course development teams, while ACC faculty develop the assessments for the courses they develop. The partner colleges all currently require that students complete high-stakes assessments in a proctored environment. Although WGU uses online proctoring, none of the community colleges have yet taken this step (though SCC plans a ProctorU pilot).

Targeting relatively “elite” students for acceleration. The other principle of CBE—self-paced learning with supports—is an area where the colleges originally diverged in their approaches but are currently coming together. Although WGU’s model emphasizes *acceleration*, it is important to note that “self-paced” learning could also occur more slowly than in an instructor-led model. In fact, this proved to be the case at BC, where they did not originally emphasize acceleration. In contrast, ACC and SCC were both explicit about the compressed or accelerated nature of their grant-funded programs, *Accelerated Programmer Training* (ACC) and *Accelerate IT* (SCC). In response to the slow movement of students through the first term of CBE courses, BC has modified their approach to emphasize acceleration more explicitly.

In any case, the partner colleges agree that not all students can excel in an environment that is largely online and requires that the student assume a great deal of responsibility for their own progress. As such, all three colleges—like WGU—are targeting a particular kind of student, one that might be considered relatively “elite” in at least two respects: (1) all the colleges are counseling students who require extensive remediation toward other programs; and (2) the colleges are recruiting students with prior college and work experience, who are often older than average.²²

Exploiting existing LMS and distance-learning technologies. To deliver their CBE courses, the partner colleges have relied on technology already in use, though some adaptations have been necessary. In particular, each college was able to adapt the distance-learning course shells within their LMS to host CBE sections. Perhaps because WGU offers courses only online, one consortium leader felt that there is a misperception that CBE models require unusual or advanced technology. However, the consortium’s experience shows, and leadership insists, that “it’s not about the technology.”

Applying manual approaches to enrollment and financial aid. One of the major hurdles for WGU in its early days was reconciliation of their CBE model with federal regulations on student aid. These challenges arise because aid is tied to “credit hours” (which don’t exist in CBE models) and “satisfactory progress” (defined with reference to conventional grades and academic terms, which are inapposite to CBE). WGU’s own approach was to create a formula that equates WGU “competency units” to the federal definition of “credit hours.” The consortium colleges have, in large part, mostly avoided this problem by assigning their CBE courses the same number of credit hours as conventional sections of the same courses. At the same time, they have worked with their registrars and financial aid offices to create work-arounds—for example, SCC’s “flex term” and “content” course shells or BC’s “out-of-sync” sessions—to the problems that arise when students enroll throughout an academic term. As enrollment numbers increase, manual work-arounds might prove less feasible, however, and the colleges might have to tackle the problem systematically.

²² Data from the Annual Performance Report to DOL show that CBE students are, on average, about three years older than students in comparable programs at the three colleges: 30 versus 27 years.

2. Areas of distinction

While the three partner colleges appear to adhere to a similar understanding of the principles of CBE, each has operationalized CBE somewhat differently, particularly in comparison to the WGU model.

Staffing. The most significant adaptation of the WGU model emerges with respect to staffing. Table VI.1 provides an overview of the lead roles for the major program components at WGU and the three community colleges. Perhaps the most striking distinction between WGU and the community colleges is the extent to which the colleges are relying on *faculty in less differentiated roles* than at WGU. Whereas WGU “unbundles” the faculty role to address distinct tasks (course development, course delivery, assessment, etc.), the departmental faculty at the partner colleges are playing most of these roles. BC offers two exceptions to this pattern: (1) different faculty members develop courses and assessments, respectively; and (2) a specific subgroup of faculty currently serve as coaches. Still, all three partner colleges have modified the traditional faculty role insofar as CBE instructors play a more reactive role than in traditional courses—that is, the faculty member does not actively facilitate, but instead responds to students’ questions on course content and provides guidance as needed. All three partner colleges have a coach or advisor to monitor student progress and notify faculty if additional subject matter support is needed.

Table VI.1. Comparison of lead* staff for key program components

	WGU	ACC	BC	SCC
Curriculum development				
Program development	Program council	Department chair	Department chair	Department chair
Course development	Product manager	Faculty	Faculty	Faculty
Assessment development	Assessment developer	Faculty	Faculty	Faculty
Course delivery				
Teaching	Course mentor	Faculty	Faculty	Faculty
Academic support	Course mentor	Academic coach	Faculty advisor	Academic coach
Grading	Evaluators	Faculty	Faculty	Faculty
Student supports				
Recruitment and intake	Enrollment counselor	Coordinator of outreach & support	Recruitment advisor†	Recruiter/admissions counselor
General learner support	Student mentor	Academic coach	Faculty advisor	Academic coach
Career services	Career center staff	Coordinator of outreach & support	Job placement specialist†	Academic/career coach

* Lead staff are those individuals with primary responsibility for the area; for information on additional staff involvement, see staffing models in previous chapters of this report.

† Recruitment advisor and job placement specialist roles at BC are played by the same individual.

The major distinction among the community colleges' staffing is how they have conceptualized and staffed their *student support roles*. As noted, BC is implementing a "faculty advisor" model, which emphasizes academic progress in coaching interactions. In contrast, SCC conceptualized their "academic coach" role as a significant enhancement of the college's limited case management model for distance-learning students. SCC emphasizes that the coach provides a single point of contact for the student, integrating support and progress monitoring, and arranging interventions when needed. In their original proposal, ACC did not plan or budget for a specific coach or advisor role. In the course of program development, however, they decided that the role would be necessary and have developed a position similar to SCC's academic coaches. With the position recently filled, the specifics of the ACC coaching role are still developing.

One additional staffing distinction is not represented in the table but could have implications for program implementation and sustainability. The TAACCCT grant program strongly emphasizes performance reporting and data for continuous improvement. As a result, most grantee colleges have identified an individual to serve as "*data lead*" for their institution. The consortium colleges have all identified such a data lead, but only at SCC is this person a current employee in the college's institutional research (IR) office. ACC has hired a former IR staff member; BC has staffed the data lead as an exclusively grant-funded role and hired an individual who had served as a CSE instructor at the college and has experience as a budget and systems data analyst.

Data analytics. Beyond staffing approaches, another distinction from the WGU model is the colleges' use of data analytics for program improvement. Analysis of performance data is a central component in WGU's curriculum development, course delivery, and student supports. As noted, data on students' progress and performance—including, for example, their completion of assignments and courses, use of learning resources, and performance on assessments—are regularly analyzed and shared with course and student mentors, among others. Such analytics support targeted interventions and inform program improvement. The consortium colleges recognize the potential usefulness of such analytics, but they are still in the early stages of building out their specific approaches. SCC is perhaps most advanced, having developed student-level reports to inform coaching. SCC also analyzes student assessment performance across sections and modalities at the end of each term, using the information to update assessments and course content as needed. ACC has developed a quarterly report on student participation and outcomes, and they are using Blackboard analytics in a more ad hoc manner to inform course delivery and improvement. BC is similarly using analytics from their LMS for course faculty, and they are working to develop reporting tools for faculty advisors.

Employer linkages. Although the partner colleges share a commitment to job-relevant curricula and draw on similarly structured employer advisory groups, there is variation in the colleges' particular approaches to building employer linkages. SCC has engaged industry, employers, and workforce agencies, in particular, through their Stakeholder Collaborative Framework. The academic/career coach also devotes significant resources to building relationships with employers and workforce agencies. At ACC, the APT coordinator of outreach and student support is proactively developing industry partnerships and serves explicitly as a liaison between students and employers. Similarly, the ACC recruiting consultant is responsible for recruiting industry partners. These partners are prominently featured on the APT program

website, as noted in Chapter IV, and the plan is for them to offer internships, interviews, and eventually jobs to APT program completers. BC also involves employers in curriculum development, student recruitment, and career services, but they have not, to date, devoted as much attention to employer involvement as the other partner colleges.

Scale-up and sustainability. The partner colleges are seeking to leverage their existing strengths to meet the demands of scale-up and sustain their programs over time, so it follows that they are taking different paths in that direction. SCC is distinct in that it is building a full CBE system, rather than a single CBE program. Similarly, by leading the project from the centralized distance-learning division rather than from an academic department, they are well poised to scale and sustain CBE beyond the grant period. SCC has drawn upon their well-developed curricular processes and experienced department faculty, which were already oriented to a CBE approach, even if their programs were not yet fully in line with the exact principles of CBE discussed here. Their offering of the CBE curriculum through multiple modalities reflects deep faculty involvement and buy-in and should help to expand and sustain the program beyond the grant's performance period. Similarly, BC's faculty are deeply involved in the CBE curriculum and student support processes, and they are unique among the consortium colleges for emphasizing competency-based general education courses as a means to reach more students with the model. Program leaders are hoping to leverage these courses to expand enrollments, which could also entrench the CBE model in how the college does business. Finally, ACC is bolstering its already strong marketing approaches to reach not only outside the institution but also within it to absorb excess demand for continuing education programs in IT. They are also seeking to expand their strong employer involvement to include using industry groups to recruit students and hiring former IT professionals for career services.

B. Progress to date

The consortium colleges have accomplished a great deal in their first phase of project implementation, which was devoted to developing and launching their respective competency-based IT programs. The work plan specified six grant deliverables as due between the project launch in fall 2012 and the time of this writing, in early 2014. Table VI.2 shows each college's status on the key milestones that feed into each deliverable due in this period. As the table shows, two of the deliverables were in the area of curriculum development (the curriculum definitions and course development foundation) and four were in the area of student support services (processes for recruitment and application, screening and placement, enrollment, and general learner supports). Learner supports are one area where most work is ongoing across the three colleges. Otherwise, each partner college has completed the necessary milestones with few exceptions.

Table VI.2. Partner college progress on grant deliverables

Deliverable detail description	Due date	Deliverable status*		
		ACC	BC	SCC
Curriculum development				
Curriculum definitions				
Revised competency-based master syllabi	11/15/13	✓	✓	Ongoing
Degree and certificate descriptions for programs of study	11/15/13	✓	✓	Ongoing
Stacked certificates (completed within a degree)	11/15/13	✓	✓	Ongoing
Curriculum definition process documented	11/15/13	✓	✓	Ongoing
Course development foundation				
Student assessment policy developed and documented	10/30/13	Ongoing	✓	✓
Program rollout plan developed and documented	10/30/13	✓	✓	✓
Course development schedule for new grant courses	10/30/13	✓	✓	✓
Course templates for new grant courses	10/30/13	✓	✓	✓
Course development foundation process documented	10/30/13	✓	Ongoing	✓
Student support services				
Recruitment and application process				
Recruiting and application process documented	8/1/13	✓	✓	✓
Student recruitment tracking process documented	8/1/13	✓	✓	✓
Marketing plans and materials	8/1/13	✓	Ongoing	✓
Student screening and placement process				
Orientation template created	1/30/14	✓	✓	Ongoing
Screening/placement process documented	1/30/14	✓	✓	✓
Screening tool selected and license(s) purchased	1/30/14	✓	✓	Ongoing
Remediation pathways documented	1/30/14	✓	✓	Ongoing
Enrollment process				
Enrollment process documented	1/30/14	✓	✓	✓
Rolling registration process documented	1/30/14	✓	Ongoing	Ongoing
Financial aid process documented	1/30/14	✓	Ongoing	Ongoing
Learner support process				
Learner checkpoints documented	1/30/14	Not started	Ongoing	Ongoing
Framework for student support documented	1/30/14	Ongoing	✓	Ongoing
Learning support process documented	1/30/14	Ongoing	✓	Ongoing
MOUs with all necessary program partners in place	5/30/13		Ongoing	✓
MOUs with all necessary measurement and evaluation partners in place	5/30/13		Ongoing	✓

* Status as of February 6, 2014. Status reported by responsible staff at each college; blank cells had no status reported.

✓ = Completed

As a consultant to the community colleges, WGU is responsible for 11 unique deliverables of its own, listed in Table VI.3. Nine of WGU's deliverables had no due date specified in the first phase of the project and many of their consulting activities will continue throughout project implementation. Still, as the table shows, WGU had recorded progress on 10 of the 11 deliverables as of this writing.

Table VI.3. Status of WGU deliverables

Deliverable name	Due date	Status
Documentation of the WGU educational system model	NS	Ongoing
Consultation of the adaptation of the WGU model for each partner	NS	Ongoing
Adaptation of the WGU student support model for each partner	12/31/16	Ongoing
Continuous improvement process for curricula	NS	Ongoing
Continuous improvement process for student support	9/30/15	Not yet started
Articulation	NS	Ongoing
State regulations, regional accreditation, and financial aid issues	NS	Ongoing
Adaptation and adoption of the CBE continuous improvement model	NS	Ongoing
Technology and automation model advisement for each partner	NS	Ongoing
Replicable model and best practice	NS	Ongoing
Use experiences with partners to encourage greater adoption of CBE in community colleges	NS	Ongoing

NS = not specified in revised grant work plan and corresponding database.

The fruits of the colleges' progress are perhaps best appreciated in light of students' actual participation in the grant-funded programs. Table VI.4 provides an enrollment summary for the first "term" of CBE courses, which the colleges began to offer at the start of the fall 2013 academic year. The table shows the number of unique enrollments at each college for the period ending September 30, 2013 (column 1),²³ and their original enrollment projections, as specified during the process that culminated in their grant application to DOL (column 2). Two of the three colleges (ACC and SCC) met their year 1 targets, and the group exceeded the overarching consortium target. However, as columns 3 and 4 suggest, they face a difficult challenge in meeting the revised enrollment targets for subsequent years, as these numbers reflect the flawed assumption, implicit in their TAACCCT application, that total consortium enrollment would include a substantial number of WGU students (as explained in Chapter I). The colleges will face an additional challenge in meeting their projections for student educational and employment outcomes.²⁴ As described in Chapters III-V, the partner colleges are currently developing plans to dramatically expand enrollment, support student success, and meet outcome projections; we will document their accomplishments in the final evaluation report, due in fall 2016.

²³ This is the official end date of the first year of the grantee performance period, for which the colleges were required to supply participation figures to DOL in their Annual Performance Report.

²⁴ DOL requires that TAACCCT grantees report outcomes in nine areas: (1) enrollment; (2) completion of a TAACCCT-funded program; (3) retention in the program of study or another TAACCCT-funded program; (4) credit hours completed; (5) credentials earned; (6) enrollment in further education after grant-funded program of study completion; (7) employment after completion of the grant-funded program of study; (8) retention in employment after program of study completion; and (9) wage increase post-enrollment for incumbent workers.

Table VI.4. Actual and projected unique enrollments by partner college

College	Y1 actual enrollments*	Y1 projected enrollments	Y2 projected enrollments	Total (Y1-Y3) projected enrollments
ACC	57	50	274	654
BC	17	50	175	417
SCC	107	50	380	867
Total	177	150	829	1938

* Actual enrollments as of September 30, 2013; enrollment defined per ETA guidelines.

C. Lessons learned

It is too early to provide a definitive assessment of best practices in CBE since, at this writing, the consortium colleges have been offering their grant-funded programs for just a few months. Nonetheless, some lessons can be drawn from the colleges' early implementation experiences. We describe these lessons here, giving special attention to the challenges that colleges interested in implementing CBE might encounter along the way.

1. Accelerated, competency-based education models are not for all students

Without the hard deadlines and regular interaction with instructors common to traditional courses and programs, some students in the consortium colleges' CBE programs might experience lackluster progress. The colleges are seeking to mitigate this possibility by targeting particular kinds of students. Toward this end, each college has developed a target student profile, which is informed by WGU's experience, the colleges' own knowledge of their student communities, and direct assessment of prospective students' academic skills and readiness for online coursework.

2. CBE programs require changes to community college institutional culture

Several features of the community college pose challenges to the implementation of CBE models. As noted throughout this report, WGU "disaggregates" the faculty role. But the consortium colleges—and, in fact, most community colleges—are not at liberty to dramatically reconceive the faculty role without much negotiation. Contracts and union rules may proscribe what faculty can and cannot do. Moreover, the particular organizational climate or culture of the institution will influence what is possible with respect not only to faculty, but also to curriculum, student services, and general administration. Changing the culture of the institution to accept and embrace CBE is a major challenge. The partner colleges have addressed this challenge to some degree by leveraging existing institutional processes, as we have discussed, especially with respect to curriculum development. They have also sought to engage faculty (and key support staff) deeply, as we describe below. However, they have had to work within existing college structures. Commenting on the challenge, one consortium leader wondered whether it might be easier to "start from scratch," which was essentially the WGU experience.

3. Faculty are central to the success of CBE models and may be key to sustainability

Although the faculty role is disaggregated in the WGU model, the roles themselves—curriculum and assessment development, course delivery, academic support, student evaluation—are all still central to any CBE model. Because faculty roles at the partner colleges were not entirely malleable, the colleges had to determine for themselves how best to deploy faculty resources in a way that was true to the major principles of CBE. A key element in this process was the early and deep engagement of department faculty, which has created buy-in to the program and supported a workable division of labor. Moreover, faculty will be necessary to carry the program forward after the grant period, so the colleges have done well to engage them and allow them to “own” different pieces of the program.

4. Expanding enrollment may require decreased program intensity

Increasing CBE program enrollment will be difficult, and the approaches the colleges take could result in the dilution of their CBE programs. This appears to be especially salient for student supports. Less intense programs may have a lower chance of measurably improving student outcomes, which would be unfortunate for the colleges and would pose challenges to the evaluation. Mathematica is working with the colleges to ensure that whatever programmatic changes are introduced, we will be able to measure student exposure to program components so as to track “dosage”—that is, students’ exposure to different amounts of the various program components. Currently, the colleges appear to be able to track exposure to coursework appropriately, but their ability to track exposure to student services is as yet unclear. If the evaluation can effectively measure dosage, it may shed light on which components—or combinations of components—are most associated with student success.

D. Next steps

The challenge of documenting the consortium colleges’ CBE models is that the programs are currently still in development. This report has described the WGU model and the partner colleges’ approaches to adapting that model to their particular institutional contexts in the first phase of project implementation. We will continue to document the colleges’ progress as each continues to adapt their model based on continuing interaction with WGU and their own experiences as the programs roll out.

The critical next steps for the colleges include continuing to roll out the courses and supports that were developed under their work plan. Key deliverables for 2014 are:

- Identification of latticed certificates
- New CBE courses
- Career placement process
- Transfer assistance process

In addition to carrying out all the activities necessary to meet the milestones toward these deliverables, the colleges will also need to refine and implement plans for scale-up, which may require the development of additional programs and courses, as well as hiring of additional staff.

Next steps in the evaluation of the consortium's TAACCCT project will address both project implementation and outcomes. For the implementation study, Mathematica will work with the colleges to prepare for and execute site visits, where the evaluation team will collect data on the colleges' programs once they are fully implemented. In contrast to this interim report, which relied primarily on document review to *describe the colleges' CBE models near baseline*, the final implementation study report (due in fall 2015) will describe *how and why the models have evolved over time*. For the outcomes study, we will continue to work with college data leads to ensure that we are able to track student exposure to key program components as the colleges refine their programs. At the same time, we will examine data from both participant and comparison groups to determine whether data are adequate to support the type of quasi-experimental design proposed in the evaluation work plan. If the data are inadequate, we will work with the colleges to identify additional data to support the analysis and develop a plan for obtaining them. Finally, we will work with the colleges to obtain student employment data from their respective state workforce agencies.

REFERENCES

Johnstone, Sally M. and Louis Soares. "Principles for Developing Competency-Based Education Programs." *Change: The Magazine of Higher Learning*, vol. 46, no. 2, March-April 2014, pp. 12-19.

This page has been left blank for double-sided copying.

APPENDIX A
STUDY METHODS

This page has been left blank for double-sided copying.

This report draws on collection and analysis of data from five primary sources:

Notes and materials from a series of webinars where each college presented their CBE model were the leading source of data for this report. Webinars were conducted in summer of 2013, just before the colleges launched their CBE programs. Mathematica worked with the consortium and WGU to develop the template for these webinars; we also developed an analytic template, which researchers used to take consistent notes across webinars. All notes were reviewed by the project director prior to analysis by the task leader and research analyst.

Extant documents related to the colleges' program development activities were collected in association with consortium meetings and calls throughout the first phase of project implementation. The documents included, for example, program descriptions, meeting minutes, and presentations on topics of curriculum development and student support processes. Information from these documents was used to develop the webinar templates and then to supplement information from the webinars.

An implementation database was designed to track the colleges' progress on key inputs, activities, milestones, and outcomes for each of 32 project deliverables. Mathematica worked closely with consortium leadership to develop the database, which was based on a series of Mathematica-led calls in which the group refined its CBE project logic model. Mathematica extracted status data on milestones and outcomes of all project deliverables that were due prior to the date of this writing (February 6, 2014).

The consortium's Annual Performance Report to DOL provided aggregate information on student characteristics and enrollment outcomes for the first term of CBE programming, beginning in August and ending on September 30, 2013 (the end of the period addressed by the report). Data for the report were drawn from the colleges' student information systems and were submitted to Mathematica for processing and analysis.

Follow-up phone calls and emails with program leaders at each college served to verify and fill in gaps in information. Mathematica prepared follow-up questions for each college after their webinar. Mathematica sent the questions to program leaders, some of whom responded by email, while others scheduled calls to discuss the questions. Information from these emails and calls was integrated with the webinar notes for each college. During the drafting of the report, Mathematica continued to communicate with program leaders at each college, as needed.

This page has been left blank for double-sided copying.

APPENDIX B

SCC SAMPLE COMPETENCY MAP

This page has been left blank for double-sided copying.

Competency-Based Course Map

Course Name	CIS 2421 – Switched Networks
Faculty Developers	
Department	Business and Public Services Division
Program	Computer Information Systems
Course Description	This course examines some of the current network design models and the way LAN switches build forwarding tables and use the MAC address information to efficiently switch data between hosts. This course also covers WLAN technology, components, security, planning, implementation, troubleshooting, and types of network attacks. Course will explore the functionality, configuration, and troubleshooting of both DHCPv4 and DHCPv6.
Assessment Notes	<p>Desired SME Qualifications:</p> <ul style="list-style-type: none"> ● Cisco Certified Network Associate (CCNA) qualified ● Cisco Certified Academy Instructor (CCAI) qualified ● A minimum of a bachelor degree in any program of study at a university
Learning Resources	<p><i>Switched Networks Companion guide</i> (2013). Cisco Press. (2013). <i>Switched Networks Course Booklet</i>. Cisco Press. (2013). <i>Switched Networks Lab Manuel</i>. Cisco Press.</p> <p>Online curriculum is available when the instructor registers the student for the course Network Fundamental on cisco.netacad.net. This gives the student access to the online curriculum and the chapter tests, Final Skill Based Assessment and Final Exam to include a Course Feedback for Cisco.</p>
Student Project Summary	<p>Will this course have an associated student project?</p> <p>Yes: <input type="checkbox"/> No: <input type="checkbox"/></p>

1 Competency 1 – Describe, Configure, and Troubleshoot Wireless Network Technologies				
Sinclair Ref	Learning Outcomes	Topic & Learning Resource	Type	ITWorks Ref
1.1	Describe wireless LAN technology and standards.	Chapter 8 Wireless LANs	Declarative & Procedural	
1.2	Describe the components of a wireless LAN infrastructure.	Chapter 8 Wireless LANs	Declarative	
1.3	Describe wireless topologies.	Chapter 8 Wireless LANs	Declarative	
1.4	Describe the 802.11 frame structure.	Chapter 8 Wireless LANs	Declarative	
1.5	Describe the media contention method used by wireless technology.	Chapter 8 Wireless LANs	Declarative	
1.6	Describe channel management in a WLAN.	Chapter 8 Wireless LANs	Declarative	
1.7	Describe threats to wireless LANs.	Chapter 8 Wireless LANs	Declarative	
1.8	Describe wireless LAN security mechanisms.	Chapter 8 Wireless LANs	Declarative	
1.9	Configure a wireless router to support a remote site.	Chapter 8 Wireless LANs	Declarative & Procedural	
1.10	Configure wireless clients to connect to a wireless router.	Chapter 8 Wireless LANs	Declarative & Procedural	
1.11	Troubleshoot common wireless configuration issues.	Chapter 8 Wireless LANs	Declarative & Procedural	

2 Competency 2 – Initial Switch Configuration				
Sinclair Ref	Learning Outcomes	Topic & Learning Resource	Type	ITWorks Ref
2.1	Configure initial settings on a Cisco switch.	Chapter 2 Basic Switching Concepts and Configuration	Declarative & Procedural	
2.2	Configure switch ports to meet network requirements.	Chapter 2 Basic Switching Concepts and Configuration	Declarative & Procedural	
2.3	Configure the management switch virtual interface.	Chapter 2 Basic Switching Concepts and Configuration	Declarative & Procedural	
2.4	Describe basic security attacks in a switched environment.	Chapter 2 Basic Switching Concepts and Configuration	Declarative	
2.5	Describe security best practices in a switched environment.	Chapter 2 Basic Switching Concepts and Configuration	Declarative	
2.6	Configure the port security feature to restrict network access.	Chapter 2 Basic Switching Concepts and Configuration	Declarative & Procedural	

3 Competency 3 - VLAN Operation, Configuration, and Troubleshooting				
Sinclair Ref	Learning Outcomes	Topic & Learning Resource	Type	ITWorks Ref
3.1	Explain the purpose of VLANs in a switched network.	Chapter 3 VLANs	Declarative	
3.2	Analyze how a switch forwards frames based on VLAN configuration in multi-switched environment.	Chapter 3 VLANs	Declarative	
3.3	Configure a switch port to be assigned to a VLAN based on requirements.	Chapter 3 VLANs	Declarative & Procedural	
3.4	Configure a trunk port on a LAN switch.	Chapter 3 VLANs	Declarative & Procedural	
3.5	Configure Dynamic Trunking Protocol (DTP).	Chapter 3 VLANs	Declarative & Procedural	
3.6	Troubleshoot VLAN and trunk configurations in a switched network.	Chapter 3 VLANs	Declarative & Procedural	
3.7	Configure security features to mitigate attacks in a VLAN segmented environment.	Chapter 3 VLANs	Declarative & Procedural	
3.8	Explain security best practices for a VLAN segmented environment.	Chapter 3 VLANs	Declarative	
3.9	Describe the three primary options for enabling inter-VLAN routing.	Chapter 6 Inter-VLAN Routing	Declarative	
3.10	Configure legacy inter-VLAN routing.	Chapter 6 Inter-VLAN Routing	Declarative & Procedural	
3.11	Configure router-on-a-stick inter-VLAN routing.	Chapter 6 Inter-VLAN Routing	Declarative & Procedural	

3 Competency 3 - VLAN Operation, Configuration, and Troubleshooting				
Sinclair Ref	Learning Outcomes	Topic & Learning Resource	Type	ITWorks Ref
3.12	Troubleshoot common inter-VLAN configuration issues.	Chapter 6 Inter-VLAN Routing	Declarative & Procedural	
3.13	Troubleshoot common IP addressing issues in an inter-VLAN routed environment	Chapter 6 Inter-VLAN Routing	Declarative & Procedural	4.6.4
3.14	Configure inter-VLAN routing using Layer 3 switching.	Chapter 6 Inter-VLAN Routing	Declarative & Procedural	4.6.4
3.15	Troubleshoot inter-VLAN routing in a link Layer 3 switched environment.	Chapter 6 Inter-VLAN Routing	Declarative & Procedural	4.6.4

B.7

4 Competency 4 - Switching Operations.				3.2, 3.3, 3.4, 3.1.3
Sinclair Ref	Learning Outcomes	Topic & Learning Resource	Type	ITWorks Ref
4.1	Describe convergence of data, voice, and video in the context of switched networks.	Chapter 1 Introduction to Switched Networks	Declarative	
4.2	Describe a switched network in a small to medium sized business.	Chapter 1 Introduction to Switched Networks	Declarative	
4.3	Explain the process of frame forwarding in a switched network.	Chapter 1 Introduction to Switched Networks	Declarative	
4.4	Compare a collision domain to a broadcast domain.	Chapter 1 Introduction to Switched Networks	Declarative & Procedural	
4.5	Describe the issues with implementing a redundant network.	Chapter 4 LAN Redundancy	Declarative	
4.6	Describe IEEE 802.1D STP operation.	Chapter 4 LAN Redundancy	Declarative	
4.7	Describe the different spanning tree varieties.	Chapter 4 LAN Redundancy	Declarative	
4.8	Describe PVST+ operation in a switched LAN environment.	Chapter 4 LAN Redundancy	Declarative	
4.9	Describe Rapid PVST+ in a switched LAN environment.	Chapter 4 LAN Redundancy	Declarative	
4.10	Configure PVST+ in a switched LAN environment.	Chapter 4 LAN Redundancy	Declarative & Procedural	
4.11	Identify common STP configuration issues.	Chapter 4 LAN Redundancy	Declarative	
4.12	Describe link aggregation.	Chapter 5 Link Aggregation	Declarative	

4 Competency 4 - Switching Operations.				3.2, 3.3, 3.4, 3.1.3
Sinclair Ref	Learning Outcomes	Topic & Learning Resource	Type	ITWorks Ref
4.13	Describe Etherchannel technology.	Chapter 5 Link Aggregation	Declarative	
4.14	Configure link aggregation with Etherchannel.	Chapter 5 Link Aggregation	Declarative & Procedural	
4.15	Verify and troubleshoot link aggregation with Etherchannel.	Chapter 5 Link Aggregation	Declarative & Procedural	

5 Competency 5 - Troubleshooting: Select and apply troubleshooting methodologies for network problem solving and prevention.				2.11,4.13
Sinclair Ref	Learning Outcomes	Topic & Learning Resource	Type	ITWorks Ref
5.1	Describe the operation of DHCPv4 in a small to medium sized business network.	Chapter 7 DHCP	Declarative	
5.2	Configure a router as a DHCPv4 server.	Chapter 7 DHCP	Declarative & Procedural	
5.3	Configure a router as a DHCPv4 client.	Chapter 7 DHCP	Declarative & Procedural	
5.4	Troubleshoot a DHCP configuration for IPv4 in a switched network.	Chapter 7 DHCP	Declarative & Procedural	
5.5	Explain the operation of DHCPv6.	Chapter 7 DHCP	Declarative	
5.6	Configure stateless DHCPv6 for a small to medium sized business.	Chapter 7 DHCP	Declarative & Procedural	
5.7	Configure stateful DHCPv6 for a small to medium sized business	Chapter 7 DHCP	Declarative & Procedural	
5.8	Troubleshoot a DHCP configuration for IPv6 in a switched network.	Chapter 7 DHCP	Declarative & Procedural	

APPENDIX C

SCC COACHING AGREEMENT

This page has been left blank for double-sided copying.

Accelerate IT

Student-Coaching Agreement

Your Name: _____

Your Major: _____

Your Coach's Name: _____

Your Coach's Phone Number and Email: _____

Objective of Agreement: This Agreement is designed to identify the expectations of you as a student, and to support you in your educational goals. Your Academic Coach's goal is to empower you to be successful as a student of accelerated, competency-based online programs at Sinclair Community College.

Expectations of Student: As a student, you are expected to

- 1) Be knowledgeable of your program and degree requirements, and understand all requirements of participating in Accelerate IT competency-based programs.
- 2) Keep coaching appointments.
- 3) Be prepared for coaching appointments by completing agreed upon action steps for enrollment, registration or any other steps to continued good academic standing.
- 4) Goal-set and complete a MAP/study calendar with your coach. Communicate with your coach if your circumstances change and you need to modify your MAP or studies.
- 5) Attend and actively participate in your studies; communicate with your coach as challenges arise.

Requirements for Participation in Competency-Based Accelerate IT program at Sinclair:

You must complete all of the core courses in your major in the competency-based format.

Successful Course Completion: You must pass *each* graded assignment in a competency-based course with a score of **80% or higher**. This includes all assignments, labs, and exams. If you are unable to earn a score of 80% or higher, you will be permitted to complete the course as if it were a traditional online course, but you will *not be able to continue in the competency-based Accelerate IT program*.

Chapter Quizzes: Each Accelerate IT course will contain chapter quizzes to help you gain mastery of course topics. *Chapter quizzes must be completed in the chronological order they are offered in the course, and subsequent quizzes will not be "unlocked" in the course until the previous quiz has been completed with an 80% or better* (for example, you may not take quiz two until you have successfully completed quiz one). You are allowed unlimited attempts at chapter quizzes.

Labs, Midterms and Final Examinations: You **do not have unlimited attempts at successfully completing labs, midterms and final examinations with an 80% or better**. Practice exams are available in every course for both midterms and final exams. Students are strongly encouraged to use practice exams prior to testing. Testing and retake policy for labs, midterms, and final examinations are as follows:

- **1st Attempt:** You may take a lab, midterm or final examination after successfully completing each of the assignments, quizzes or labs that precede the lab, midterm or final in question.
- **2nd Attempt:** If you do not pass the lab, midterm or final examination with an 80% or better, you may request a second attempt from your instructor. There is a 48-hour waiting period before you may attempt a retake.
- **3rd Attempt:** If you do not pass a lab, midterm or final examination on the second attempt, you must submit a remediation plan to be considered for a third attempt. A remediation plan should fully describe how you plan to succeed on a third attempt. A third attempt is granted at the instructor’s discretion.

Checklist for Accelerate IT Students:

Prior to the Start of my First Term...

- I have completed all necessary enrollment steps:
 - I have completed the college application
 - I have completed admissions counseling and orientation
 - I have submitted official transcripts to the college and/or placement tested
 - I know how I will pay for college and I understand “Satisfactory Academic Progress” if I am using financial aid
 - I have my Tartan ID and I know how to log-in to my.sinclair
 - I have completed “How to Succeed in an Online Course”
- I have a completed MAP and study calendar
- I understand my major and program requirements, and how competency-based learning works
- I know when to log-in to my first class
- I have paid for my classes and any necessary textbooks
- I understand my role as a student, and my coach’s role in my educational experience. I know to reach out to my coach *first* if I need assistance with anything at the college.

Each Term...

- I will keep my check-ins and appointments with my coach
- I will check my MAP, and talk to my coach about any needed changes
- I will monitor “Satisfactory Academic Progress” with financial aid, and update my FAFSA or information as necessary
- I will reach out to my coach when I am struggling or need help

Prior to my Final Term...

- I will ensure that I have met all program/degree requirements for graduation
- I will utilize career resources such as interview and resume preparation or career counseling before graduation
- I will communicate with my coach if I plan to transfer to a 4-year, and develop a transfer assistance plan
- I will complete an exit interview with my coach to talk about my experiences

After Graduation...

- I will follow up with my coach once in the workforce or transferred to another university
- I will celebrate and take pride in my hard work and accomplishments!

I understand the requirements of the competency-based Accelerate IT program, and agree to the requirements of this program.

Student Signature _____ Date _____

Academic Coach Signature _____ Date _____

This page has been left blank for double-sided copying.

www.mathematica-mpr.com

Improving public well-being by conducting high quality,
objective research and surveys

PRINCETON, NJ ■ ANN ARBOR, MI ■ CAMBRIDGE, MA ■ CHICAGO, IL ■ OAKLAND, CA ■ WASHINGTON, DC

MATHEMATICA
Policy Research

Mathematica® is a registered trademark
of Mathematica Policy Research, Inc.