Fall 2014 Site Visit "Snapshots"

Berkshire Community College

Year 1 Review

The STEM Starter Academy program at Berkshire Community College focuses on bringing recent high school graduates into STEM fields at BCC. It is composed of a three-week summer bridge program followed by a fall engagement and support program. Each cohort of students enters the program with the expectation that they will move as a group through both parts of the program. The SSA program had strong retention from summer into fall. High school recruiting liaisons encouraged and supported underrepresented students' efforts to apply. The SSA program is overseen by the Dean of Business, Science, Mathematics, and Technology and managed by a part-time coordinator.

Recruitment and readiness components

- Three-week "Summer Success Program" – This program focused on building students' awareness of STEM fields, increasing their readiness for college, and building relationships among a cohort of peers. Students were offered a $1000 scholarship for the fall for participation in and completion of the summer program.

  SSA participants were offered a STEM "success kit," which included a gas card, a bookstore voucher, and a tablet computer (on loan to students until two consecutive semesters at BCC had been completed).

Retention and completion components

- Fall support program – The fall program included requirements for periodic check-ins with faculty and peer mentors, attendance at group meetings and STEM-engagement and college-skill-building workshops, and participation in STEM-themed field trips. A scholarship for the following spring was offered as an incentive for completion of program requirements.

  SSA students were encouraged to apply and supported in their application to be "STEM scholars" during their second summer. This is a separately funded program that targets more advanced students. Existing STEM scholars served as peer mentors for SSA students in the fall.

Year 2 Description

The second year of SSA at Berkshire Community College had similar components as Year 1, but included some changes to recruitment and summer bridge programming based on lessons learned in the first year. Notably, a new and successful recruitment strategy, which offered stipends to high school faculty and guidance counselors to act as "liaisons" between SSA and the high school, yielded a larger cohort for summer 2015. In addition, the structure of the summer program was shifted to emphasize cohort relationships and college skills earlier and to offer a more intensive mathematics remediation focus. UMDI conducted a site visit to BCC near the end of the fall 2014 semester.

Recruitment and readiness components

Recruitment liaisons.BCC offered $250 per semester to high school STEM teachers or guidance counselors to do internal recruitment for SSA. Recruitment liaisons met with SSA staff at BCC, set up recruiting events for the SSA coordinator, and met with interested students at their schools. The liaisons acted as a primary contact person for SSA at their school, supporting prospective students, but also

encouraging students to apply who they think would be a good fit for the program. To get the stipend, they completed a survey reporting their activities and contact information to the SSA coordinator at BCC.

Recruitment open house events. Students, parents, and high school liaisons were invited to open house luncheons at BCC where they met key faculty and staff, attended brief hands-on STEM demonstrations by faculty, took a campus tour, and received an SSA application. Attendees had to register for the event in advance, which provided the SSA coordinator with contact information for following up on applications.

UMDI observed the welcome session at one of these open house events in early December. It was the middle of the day on a snowy Thursday, suggesting a non-trivial level of motivation among the attendees. Twenty-five people were there, including students, most of whom were with a parent, and a couple guidance counselors. Two college faculty members and a handful of current SSA students were also there. The SSA coordinator met attendees at the door to sign them in. She was very welcoming, greeting each student and parent by name and even recognizing several students by sight.

The Dean of Business, Science, Mathematics, and Technology emphasized the statewide nature of SSA program and talked about the importance of being "critical, scientific thinkers" in any field. He personalized his message by talking about his own path and how an opportunity like SSA might have helped him. The college president also spoke briefly, offering strong support for the SSA program, emphasizing the quality of the STEM programs at BCC (saying BCC students can transfer "to any college in the country and succeed"), and highlighting the "bargain" that comes with choosing a community college. She knew some of the current SSA students by name and seemed very familiar with the program. Both the dean and the coordinator emphasized that the program is about exploring STEM interest and does not require that students make a "lifetime commitment" to STEM.

Summer success program. During the first year, academic preparation in mathematics, reading, and writing (for those students who tested below "college ready" on assessments) took place during the first week of the bridge. This was followed by a week of college-readiness workshops, then a week of STEM-themed exploration. In Year 2, the first week (mandatory for all SSA students) focused on college readiness and self-exploration, and helped to build relationships among students. The second week included academic preparation in mathematics only (mandatory for those who had not placed into college-level mathematics). The third week was voluntary, focused on STEM exploratory activities, and included hands-on workshops with college faculty and field trips. Students were offered $500 in fall scholarships per week for participating in the first and third weeks ($1000 per student, total).

> *"The tools that you learn are very helpful. And you learn a lot about yourself - how you like to study and what you need to do to be successful."*
> *BCC SSA student*

> *"It helps having people to root for you, especially in a new environment. It's scary. College is scary. You don't know what to expect."*
> *Berkshire SSA student*

Students who were part of the summer 2014 cohort felt that the tools and strategies they learned for transitioning to college had been very helpful, both in terms of concrete systems (e.g., taking notes, sitting in the strategic locations in the classroom) and in terms of self-knowledge. One example a student gave was that she learned that "you *can* go and ask your professor how you're doing …. You might think you're doing really great and then, you're not …. But if you don't catch that, it might be too late to fix it when you do find out." In addition, having an early introduction to the campus helped students feel better prepared for the academic year. One student said, "It helped me acclimate to the campus. I was here three weeks over the summer whereas [for] other [students], September was their first day. I already had the campus down. I had friends that I could go to if I needed to know how to get to a certain place." Students became comfortable with staff, faculty, and

peer mentors, so they knew where to turn when they needed help. One said, "The bridge to college thing over the summer really helped me get to know people and to get more comfortable. You always know that [the coordinator] is there to help you."

"The progress reports helped me know where I was at in my classes. I was really worried about my math class so I went to meet with my professor to go over things and that gave me confidence."
Berkshire SSA student

Retention and completion components

Fall support program. Students who complete BCC's summer success program were transitioned into the fall support program, which included a mix of requirements including mentorship, college success skills workshops, STEM exploration activities (i.e., field trips and seminars), community service, cohort meetings with the SSA coordinator, and periodic check-ins with faculty. Students who met the requirements were offered a scholarship for the following spring semester.

In general, students felt that the fall support program offered helpful structure as well as a continuation of the support networks they had built over the summer. As one said, "You know you're not going to fall through the cracks." Both students and administrators commented that the requirements for the fall program might need some adjustments. Nevertheless, students found many of the requirements useful. For example, students felt that meetings with mentors and with faculty were helpful and some commented that they were likely to continue with those practices even if they were not required.

"You think about new opportunities that you probably would have never thought of for yourself. It makes you think that maybe this is something that I want to look into more. It just opens up those gates of opportunity."
Berkshire SSA student

Summer and fall STEM exploration activities were a highlight of the program for many students. They reported learning about new fields and opportunities they had not considered. One said, "It helps you develop a path to go down—what the next step is going to be, even after BCC, when you graduate, if you [want to] go to a four-year school."

Bunker Hill Community College

At Bunker Hill Community College, STEM Starter Academy is composed of two main components: accelerated developmental mathematics course "clusters" (combining two courses into a single term), and workshops introducing students to core concepts in introductory STEM classes. The program targets current and incoming STEM students who have developmental mathematics placements. It is run by a STEM coordinator who has some staff support and reports to a committee composed of the Dean of Science, Engineering, and Health; the Dean of Mathematics and Behavioral Science; the Director of Institutional Effectiveness; and the Director of Grants Development.

Year 1 Review

Recruitment and readiness components

- Accelerated developmental mathematics clusters incorporating biology and engineering applications were designed in spring 2014 through a collaboration between mathematics and science faculty. Two clusters were designed: One paired two developmental courses, MAT097 and MAT099, and was worth six credits. The other paired a developmental course with a college-level course, MAT099 and MAT194, and was worth seven credits. Each cluster moved students through a year of mathematics in one semester.

- Two sections of each cluster were offered in summer 2014 during an intensive eight-week session, with classes running three hours per day, four days per week. Each section had 15 students, an instructor, and a teaching assistant. Participating students had access to a STEM study space and facilitated study groups and received support from the STEM coordinator, peer mentors, and tutors. Students participated in the clusters for free (including free textbooks) and students who completed the session were offered a $1000 stipend. Fifty-nine of 60 students completed their respective courses.

Retention and completion components

> *"After a while, students get discouraged. Especially with math. Our feelings just go down … it [could take] all these years to finish just the [prerequisite math]. Instead, [through SSA] after 6 weeks, we're already ahead."*
> *Bunker Hill SSA Student*

- Four-day workshops on engineering or biology were offered at the end of the summer to students who had participated in the summer mathematics clusters. Taught by faculty who had collaborated on the mathematics cluster curriculum, these workshops were designed to introduce students to the content of the course and the major, teach college success skills, and solidify cohort connections that were built in class. The workshops were free and voluntary. Cluster participants were offered $200 for participating. Forty of the 60 summer cluster participants attended the workshops.
- SSA expanded academic support by funding additional facilitated study groups in chemistry, biology, mathematics, physics, and other STEM fields. Faculty and professional tutors were paid to help students in a designated STEM study area.
- A STEM learning community met every two weeks and featured guest speakers, advising, registration help, and transfer counseling.

Year 2 Description

In Year 2, Bunker Hill extended its summer offerings into the academic year, offering the developmental mathematics clusters in the fall 2014 and spring 2015 semesters, and the engineering and biology workshops in January. The college also carried forward its support of "cohort 1" students who had completed summer mathematics clusters with ongoing tutoring, advising, and learning community activities, as well as continued contact by the STEM coordinator.

Recruitment and readiness components

> *"The fact that we get all this help, it makes me feel more motivated, that I'm not behind all the time."*
> *Bunker Hill SSA student*

Developmental mathematics clusters. Bunker Hill offered one section of each mathematics cluster in fall 2014, taught by the same faculty and with the same curriculum as the summer session, but over a longer, 16-week term. The clusters were offered for free, including textbooks, but students were not offered a stipend. Each section had a student acting as assistant, mentor, and tutor in addition to the instructor.

During UMDI's observation of the 097/099 cluster, students were very engaged and the class was highly interactive. There were twelve students, the professor, a peer tutor, and the SSA student assistant. All the chairs (with connected desks) were on wheels and the room had many movable and fixed white boards. This made it easy for students to move to work in groups or move to watch something being worked out on one of the boards. A couple students who sat on their own and were quietly making up an exam, but the rest were gathered in groups of about four around one of the instructors and a white board. Each

student had a sheet of problems and seemed engaged and comfortable working alone or together, or asking for help or trying to think through things out loud. The professor had a collaborative, friendly, and non-hierarchical style. She was sitting in one of the chairs, like the students but would regularly get up to write on the board. After writing a problem on the board, she would then ask the students to figure out the logic of the steps to solve the problem and give them hints only when they seemed really stuck. She tried to model this teaching style to the two teaching assistants. At one point, she looked over to one of the other groups and said, "Write it up on the board! Don't let [the assistant] do them anymore. Party's over. Show me the money."

"If you didn't understand something, it wasn't like everyone was going to look at you like, 'why are you asking this question?' There is no feeling of standing out. Everybody was like, 'you need help with something? Let's solve this problem together.'"
Bunker Hill SSA student

Students who took either the fall or the summer clusters had many positive things to say about their experience. They appreciated the ability to accelerate their progress through developmental mathematics, which shortened the time until they could take courses in their major. Although the pace was challenging (especially for the summer students), students reported feeling well supported by faculty, tutors, and SSA staff. In addition, they felt that the interactive style of the class made it easier to learn the concepts and the contextualized examples made the mathematics content engaging. According to students, the faculty seemed genuinely invested in students' learning and growth. Faculty shared their own experiences that illustrated applications of the mathematics problems, they pushed students to work hard without being impatient, and they followed up with students individually outside of class. One student said, "Some professors, when you ask for help, speak to you … like, 'You should already know this information', but the SSA professors are like, 'We're going to teach you this step by step by step.'" Finally, some of the summer students felt that the $1000 stipend had made it easier to make the intensive time commitment.

"In a typical class, you don't get one-on-one. … with the [SSA] class, the teacher knows you more. They pay attention more to you and try to help you."
Bunker Hill SSA student

Being part of a STEM-specific class seemed to build students' sense of connection to each other and a sense that they were part of "something special." One student said she felt that "everybody there is on the same page of STEM" and that it was easier to relate to students who "have the same mindset and who are trying to go after the same thing." The sense of connection was evident when UMDI spoke with students in the focus group. They seemed to feel comfortable with one another. Even having a common experience seemed to connect students—students from the fall and summer mathematics clusters openly asked questions and shared advice with one another. As further evidence of this sense of connection, the SSA coordinator reported that ten students from the summer session signed up for the same section of mathematics in the fall so they could be in class with each other and with the instructor they knew, despite the fact that the section met at 7 a.m.

Retention and completion components

STEM workshops. A second session of these introductory workshops in biology and engineering were offered in January for students who took the SSA mathematics clusters during the fall semester. During our visit, students who had taken the summer workshops said they had been helpful in preparing them for STEM courses in the fall. One student said, "This was my first semester taking an engineering course, and that workshop just told me everything that I would be dealing with. It made me feel more comfortable. I was actually stoked to come back to school and be a part of it because I felt like there was somebody there to support you."

Learning community. The STEM learning community offered a series of workshops, information sessions, and guest speakers throughout the course of the semester. Topics included an introduction to STEM, internships, STEM advising, and transferring. A guest speaker from Harvard Medical School started off the series.

> *"I felt special [to be part of SSA] … I felt like somebody actually cared about what I was doing, to put me in a group like that, I felt proud."*
> *Bunker Hill SSA Student*

The day of our site visit, the guest speaker was Steven Poynter, a Ph.D. candidate working in chemical biology at the Broad Institute (Harvard and MIT), who had started his college career at community college. He emphasized, "I'm not special. Anyone could do the same thing." Twenty-five students attended, sitting on stools at long lab benches and eating free pizza. They were quiet and seemed to be listening carefully to the speech. Students asked practical questions, such as, "How much to grades matter?," "How do you get an internship? Are they paid?," "How much do you have to teach yourself?," "What kind of commitment is it? Could you have a family? Kids?"

Massasoit Community College

At Massasoit Community College, SSA had several components: a five-week intensive summer bridge program for incoming students focused on developmental mathematics (supplemented with STEM career awareness, research exposure, and college success skills), an academic-year STEM scholars club, a research internship program, a self-paced mathematics program in area high schools, and a mathematics boot camp to help students improve their placement test scores. Across these components, target populations included high school students, incoming, and current community college students. Underrepresented groups were recruited through engagement with high schools in nearby underserved communities. The SSA program at Massasoit is overseen by the dean of mathematics and science and managed by an SSA coordinator and a STEM project coordinator.

Year 1 Review

Recruitment and readiness components

- Summer bridge program – Five-week program, focused on developmental mathematics and using a computer-based, modular curriculum. Included STEM awareness and research activities, field trips and invited speakers, academic advising and mentoring, and supported open mathematics lab time.
- Mathematics boot camp – Program offered to current students using self-paced mathematics software to prepare and improve scores for placement testing.

Retention and completion components

- Summer research internships **–** Current students work with faculty mentors on ongoing research projects in genomics and ecology in a paid internship. Summer research students acted as mentors to summer bridge program students, who worked on a small research component.
- Infrastructure upgrades **–** Two new computer labs were built for self-paced developmental or college-level mathematics courses. Equipment was purchased for research labs.
- Curriculum revision – Developmental mathematics sequence was redesigned and new mathematics curriculum was developed.

Year 2 Description

During Year 2, Massasoit continued its summer bridge and summer research programs and introduced new retention- and completion-oriented components.[1] The latter included a "STEM scholars" program to support and retain STEM students through the academic year and an extension of research internships into the academic year. Massasoit also boosted its recruitment and readiness efforts by offering developmental mathematics at area high schools using its self-paced modular curriculum.

> *"I wasn't going to take any science classes, but now that I'm [in] the STEM internship, I've changed my entire major."*
> *Massasoit research intern*

Recruitment and readiness components

Summer bridge program. Massasoit planned to replicate the five-week summer bridge program focused on developmental mathematics in Year 2. Both students and administrators felt that the model from Year 1 had been successful. Students who participated in the 2014 summer bridge said that it helped them gain confidence in mathematics, build mathematics and science skills, prepare for college, and learn about new career paths. One student said, "When I came to Massasoit, I had no clue what to expect, what to do …. I applied to SSA because I thought it would help with my math skills …. I started the lowest you possibly can with math, and next semester [the first spring following entrance at Massasoit], I'll be up on my 5th level already. I'm going up." The mathematics was intensive ("We did math every day, all day," said one student) and students appreciated breaking it up with career-oriented speakers and field trips. The students also felt well supported, despite the intensity, and consequently gained confidence in their own skills. "Now I don't really hate math," said one student, "I can understand it now. I can understand science now."

> *"Having [the SSA program] get you prepared for [college] is huge; it's such a big difference. I was so nervous my first day of SSA, but my first day of starting the school year, I was so excited. I was like, 'Oh, I can't wait. I know where all the buildings are. I know what to expect. I know where all the classrooms are and I already know some students, so it's going to be great.'"*
> *Massasoit SSA Student*

Coordinators and faculty were accessible and supportive, according to students, helping with coursework, advising, and college skills such as time management. One student said she talks with one of the coordinators "all the time about what [she] want[s] to do and what [she has] to do to get through school." Finally, students appreciated the head start they received in terms of being prepared for college life. One student said, "I feel like if I didn't start in the summertime, I probably wouldn't have lasted as long as I have now."

Developmental mathematics in area high schools. Massasoit faculty taught six sections of developmental mathematics (four funded through SSA) at area high schools in fall 2014 using the computer labs in those schools and the colleges' self-paced, modularized mathematics curriculum. The goal of the program was twofold: to boost high school juniors' and seniors' mathematics readiness and to develop a relationship between Massasoit faculty and high school students as a potential recruitment tool. In some cases, the courses were used for mathematics credit recovery or as part of Educational Proficiency Plans for students with a low MCAS scores. Massasoit pays for the ALEKS software access codes for students.

Retention and completion components

[1] Massasoit's plans to expand the summer bridge program to a second campus with a focus on engineering were likely postponed due to the 9c budget cuts.

Research internships. Based on the success of the summer research internships, Massasoit piloted an academic-year research internship program in Year 2. Students worked ten-hours a week on either a computer-based genomics/bioinformatics project describing fruit fly genes or a project focused on ecosystems and native pollinators. Students and faculty mentors were paid through SSA. Some research interns had participated in the SSA summer bridge, some had done summer research internships, and others were new to SSA. Positive word of mouth spread about summer and fall internships and the coordinators reported in the fall that students were "already lining up for next semester."

"We ask questions and create things physically—really create things. We do testing and get data in. I love being a part of it."
Massasoit research intern

Students who were doing fall research internships or had done summer research internships had overwhelmingly positive feedback about their experiences. In addition to bolstering their resumes, student interns reported that they gained confidence, new skills, awareness, and a sense that they were doing work that was "benefitting the science world." According to students, talking with faculty research mentors exposed them to new career ideas and changed their way of looking at the world. One said, "Science is incorporated in a lot of things I didn't even realize." Another explained that participating in research helped him "have a better perspective on what's actually out there. Everyday things that you just walk by or don't even notice that you can learn from or change, or make a difference in." Students also appreciated learning in an experiential way. One said, "I like getting to do things in the in the internship that you can't really get out of a regular class …. I get to actually set up the experiment, set up the question and see if you can answer it." Several students commented that participating in internships helped shape their educational pathways and career aspirations, including one who said, "[I] changed my major to be computer science because I actually love doing the research."

"When I met with [the coordinator] to talk about my courses for next year, we actually worked out a plan for me to get into a program at a four year school. We looked into different schools to see what I had to do, the grades that I had to get."
Massasoit SSA student

"STEM Scholars" program. Former and current SSA participants and other STEM students were invited to participate in this voluntary program designed to support students in their transition into the first year of college and build community around STEM interest. SSA coordinators sought student input and leadership for the program in the fall semester. The emerging outlines of the program included monthly meetings, a career seminar series, a peer mentorship program, and possibly field trips. Administrators hoped the program would provide students with a way to stay connected to their peers, faculty, and staff; gain new knowledge and awareness around STEM career possibilities; and learn leadership and success skills that would serve them in college and career.

"[By] having [students] create the career seminar series—that's going to allow them to build up those skills that are really necessary, like being on top of things, project management … where they'll learn by doing it as opposed to learning by being told. We can incorporate study skills and life skills into that where they are just doing it and learning from it that way."
Massasoit SSA coordinator

UMDI observed the introductory meeting of the STEM Scholars. Fourteen students attended along with a handful of STEM faculty. Pizza was provided. Students were very engaged as the SSA coordinator explained the initial vision for the program. The coordinator's tone was conversational and students seemed to have good rapport with him and with each other, showing a willingness to ask questions and make suggestions. The students seemed excited about the new program and interested in taking on the kinds of leadership roles and tasks

encouraged by the coordinator (e.g., to invite guest speakers or design activities). Students said they liked the idea of having more regular contact with other STEM students. They were also interested in shaping the SSA program as it moved forward, with several wanting to select and work with future SSA students. Students' questions possibly suggested a desire to feel that their participation was exclusive or special. For instance, they asked how many of the SSA participants were invited to the STEM scholars program. Administrators hoped the program would become "higher profile" so that participation could be seen as a "reward for motivation."

Year 3 Plans

Looking ahead, Massasoit SSA administrators and staff thought about expanding their summer academy to include aspects of computer programming. They also considered starting programs specific to students interested in engineering or allied health. In addition, they hoped to expand and strengthen their relationships with industry, both to improve the prospects for sustainability of their existing programming and to build linkages that would help students secure internships and increase their awareness of options.

MassBay Community College

The STEM Starter Academy program at MassBay Community College included a wide array of opportunities and support for a range of students, including high school students, incoming students, and current students. MassBay's programs focused on building STEM interest and awareness, boosting readiness in developmental mathematics, supporting transitions into career, and supporting four-year college transfer. MassBay attempted to recruit underrepresented groups by reaching out to People of Color in Independent Schools – New England (POCIS-NE) by generating marketing materials in Spanish and Portuguese and by offering STEM workshops for female students. Different students participated in different elements of the program, although there was sometimes overlap. A large team of faculty and staff coordinated the various elements, under the direction of the dean of Science, Technology, Engineering, and Math and two SSA-supported staff coordinators. SSA funding often contributed to sustaining or expanding existing successful programs at MassBay, but was also used to advance new innovations for supporting and retaining students.

Year 1 Review

Recruitment and readiness

- ***Summer bridge program for high school students***. In these two-week programs, students chose to participate in either intensive, experiential, accelerated college-credit coursework, or a series of non-credit exploratory workshops. Students paid $100 for either option. The coursework option (only for juniors or seniors) included either an engineering design course (4 credits) or a cyber-security awareness course (2 credits). The workshop option took place over four 2.5-day workshops, all based on computer coding but included elements of engineering, electronics, design, and robotics.
- ***Summer workshops.*** One week workshops for high school and existing MassBay students were offered. These hands-on workshops focused on introducing life sciences or biotechnology.
- ***Spring workshops***. Spring STEM workshops for high school student about topics such as marine biotechnology and "artbotics" were offered. Two of these workshops were offered specifically to female high school students.

Retention and completion

- ***Internship programs***
    - TechBay Internships – Students participated in paid internships working at the college's technical support center to help fellow MassBay students. Interns gained confidence while learning applied technology skills and job-relevant soft skills.
    - Technology Internship Program – Students attended a speed-networking event on campus with employers who had committed to offering internships. Before the event, students attended a resume writing workshop and mock interview session. Thirty-eight students participated and 15 received paid or unpaid internships and co-op credit.
- ***STEM Expo***. A biannual event that featured student-created exhibitions of work developed in STEM courses. The event offered current MassBay students an opportunity to learn about STEM fields, and students from middle schools and high schools were invited to learn about STEM programs at MassBay. Local employers and community members were also invited to learn about MassBay's STEM programs, and occasionally students received job offers through the Expo.
- ***Tuition assistance***. Tuition assistance for the fall was offered to MassBay students who took one of eight gateway STEM courses during summer 2014 and continued at the college in the fall.
- ***Professional development***. Support was offered for faculty and staff to attend regional and statewide workshops, conferences and seminars and to host STEM guest lectures on campus.
- ***Investment in STEM classroom infrastructure***. Teaching infrastructure investments included IBM ThinkPads for mathematics classrooms, which allowed faculty to demonstrate concepts in Excel and students to collect and analyze real-time data in the classroom.

Year 2 Description

During Year 2, MassBay focused its SSA efforts around student supports, with an eye toward retention and completion. The site introduced both industry- and peer-mentor programs, invested in instructional support for developmental mathematics and information technology classes, and facilitated curriculum alignment efforts with industry standards in information technology and computer science. MassBay also continued its summer bridge program, internship programs, and STEM career exploration events.

Recruitment and readiness

Summer bridge program for high school students. Two-week program included course and workshop options, a STEM-focused campus tour, industry speakers, an academic success workshop, an introduction to the MetroWest College Planning Center, and a presentation on STEM careers and STEM programs at MassBay. Year 2 course options included an engineering design course (using industry-standard SolidWorks 3D engineering design software) and a digital imaging course. Workshops were offered in "Artbotics," where students build and program interactive, kinetic sculptures; "mobile apps," where students create their own Android applications using the App Inventor visual programming language; and coding, where students learned to use "Scratch" visual programming tools or were introduced to fundamental computing concepts on "Raspberry Pi" small, programmable computers. MassBay leveraged funds from a Boston Area Advanced Technological Education Center grant to support the workshop portion in Year 2.

Academic support. SSA funding was used to add instructional support for courses and to pay students to act as peer mentors, tutors, study group facilitators, or teaching or laboratory assistants. SSA also supported a dedicated information technology / computer science laboratory staff position. This position freed some MassBay faculty to engage in curriculum development and instructional design.

As a key piece of this instructional support, trained learning specialists were embedded in self-paced, technology-integrated developmental mathematics classes during the fall and spring semesters. During our observation of one of these "Math 1-2-3" classrooms, the learning specialist was one of two instructors working with eight students. The students were engaged with their work; a couple students worked together on problems and many wrote out problems in their notebooks at the encouragement of the instructors.

> *"Having that extra help for students in a lot of these [experiential] courses is really important. It's about having somebody close by they can reach out to when they get stuck. Because when you get stuck, it's … about doing. If you cannot do it, then you cannot move forward."*
> *MassBay faculty*

According to the lead instructor, the self-paced format of the course and the additional instructional support allowed the instructors to provide students with individualized help and attention. Our observations corroborated this. The software allowed instructors to track the progress of individual students, and the lead instructor seemed to be familiar with each student's particular status. In the classroom, the learning specialist focused on one-on-one intensive work with a few students, allowing the lead instructor to circulate and check in with other students about their progress. During our observation the lead instructor approached several students to offer targeted support related to their progress in the course. She offered, for example, to help them "make a plan" to complete a number of modules by the end of the semester.

Retention and completion

STEM mentor program. MassBay piloted a mentor program in the 2014–15 academic year that matched 38 employees from a local biotechnology company (Genzyme/Sanofi) with 41 MassBay STEM students selected from underrepresented populations. Both students and mentors were offered training and guidance, and students were asked to agree to a code of conduct. Mentors and mentees met at least monthly and also communicated via email or phone. Mentees participated in group and individual meetings with the coordinator and also attend STEM-career themed workshops (which were open to other MassBay students, as well). Administrators felt the program served as a strong retention tool.

Students who participated in the STEM mentor program were overwhelmingly grateful for the experience and positive about its benefits. They said that they felt that their mentors were easy to talk to and had been generous in sharing time, despite their "packed schedules." Mentors gave mentees tours of their labs and talked about their daily work, which helped students to imagine applications for their topics of study. One student said, "I get to see what I'm studying and how it can be used in real life." Mentors also discussed the paths they had taken to get to their careers and offered advice to students about moving ahead in their educational pathways. One student (a first-generation college student preparing to transfer to a four-year school) said, "I knew where I wanted to go, but I didn't know the steps between here and there. [Having a mentor] makes it more realistic. It's great to have somebody who's been through it [to ask,] What should I focus on? What to expect? How was it? Every time I have a question, I text him. I didn't know about all these things I had to do."

> *"The mentorship program … helped shape my career goals. I have met with wonderful professionals … We talk about our lives, career path, and our future goals. I believe this mentorship program will help me grow into [the] professional world."*
> *MassBay STEM mentee*

Technology internship programs – In Year 2, MassBay continued to support TechBay internships and the Technology Internship Program through SSA. One student, who received an internship through the Technology Internship Program, explained that it was a valuable opportunity to learn to adapt skills learned in class and use them in an applied setting. The internship involved redesigning a website for a local company. The student said, "It was a good way to see a different side of IT. The company was using a different platform than I was used to, so being able to figure out how to [adapt to that platform] was something I couldn't learn in school. Everyone is going to use a different platform that I will have to learn."

STEM career exploration events – SSA continued to support the STEM seminar series and Friday forums (affiliated with the STEM mentor program), where faculty and staff invite industry leaders to speak with students about STEM careers. MassBay also continued to use SSA funds to support the STEM Expo events, which simultaneously offered exposure to STEM fields of study for current and prospective students, professional development for current STEM students, and relationship building between the college's STEM programs and local community and industry.

Summer 2015 Site Visit "Snapshots"

Northern Essex Community College (NECC)

The SSA program at NECC is organized by a committee of various faculty and staff including representatives from the admissions office, academic resources and tutoring, and STEM faculty. This committee is overseen by the director of Academic Affairs operations. Students who are affected by the SSA are not required to participate in all or multiple aspects of the program—although in some cases students take part in more than one of its components. In Year 2, NECC administrators decided to target underrepresented students with greater intentionality by focusing its second year SSA funds on STEM students attending the Lawrence campus, which is a federally designated Hispanic Serving Institution.

Year 1 Review

In Year 1, the focus of SSA activities was retention and support of current STEM major students, and engagement and recruitment of high school students.

Recruitment and readiness components

- Five-week summer "STEM prep" bridge program focused on lab science and college success skills (targeting incoming students and current NECC students in developmental courses).
- Mathematics curriculum alignment – a collaboration with between area high schools, GEAR UP, and NECC faculty to align developmental and college-level mathematics with the MA Mathematics Curriculum Frameworks.
- High school STEM engagement, recruitment, and college prep activities (college-for-a-day sessions, afterschool programming, STEM college-prep workshops for 9th- and 10th-grade students, and STEM-oriented recruitment open houses).

Retention and completion components

- Technology infrastructure upgrades including the purchase of a digital radiography system to replace outdated x-ray equipment as well as the construction of a modular mathematics lab to assist college students' transition from developmental to college-level mathematics.
- Supplemental instruction and tutoring in STEM fields.
- Textbook lending library.

Year 2 Description

In Year 2, NECC continued to use SSA funds to support a range of activities that affected current NECC students and area high school students. As previously noted, NECC shifted focus toward its growing Lawrence campus. NECC continued to fund supports for current students including increased STEM tutoring hours, expanded supplemental instruction, a textbook lending library, and additional technology infrastructure upgrades. NECC also continued its outreach and engagement with high schools and high school students with STEM engagement and college readiness activities. In summer 2015, due to 9c budget cuts, the college did not offer the multi-week "STEM prep" summer bridge. Instead, NECC offered to current students a series of four-day "App Inventor" workshops and a Calculus I and II boot camp. New elements in Year 2 included a peer mentor program and STEM retention scholarships.

Recruitment and readiness components

High school engagement activities. In Year 2, NECC continued to offer a variety of activities designed to engage high school students in STEM and build a connection with NECC. These included a STEM-focused afterschool program, college-for-a-day sessions at the NECC campuses, and a spring 2015 bridge program for a targeted group of Lawrence High School seniors. An administrator explained that high school engagement is important because students who choose to go to community college after high school typically have greater financial need, face "harder challenges," and are often first-generation college students who do not have a clear idea of what college is like. According to an NECC administrator "you have to make it a reality for them."

Afterschool program. The afterschool program consisted of technology-focused engagement activities designed to introduce underserved high school students to the college and to STEM. Open to 9th- through 12th-grade students from Lawrence High School, the free program ran twice a week on NECC's Lawrence campus throughout the school year. One activity involved drawing shapes by programing a robotic car that had a pen attached to it.

SSA bridge program. In partnership with Lawrence High School and GEAR UP, NECC offered a bridge program to Lawrence International High School seniors in the spring (Feb – May 2015). To be selected, students had to express a high level of interest in STEM majors and careers, plan to attend community college in fall 2015, and be underperforming on STEM academic assessments. Thirteen students participated and were offered developmental coursework in mathematics and reading and an orientation to college, including a visit to the NECC campus. Classes were held during the school day on the high school campus.

"College for a Day" activities. These activities were designed to help high school students who might not otherwise be considering college see NECC as a realistic path. Students were invited to STEM classes to watch lectures and sometimes engage in hands-on course activities. They spoke with current students and admissions staff, and took a campus tour. An administrator explained that these activities help students mentally and academically prepare for college, saying "I think once you've shown that [college] is not different, that it is just another step, I think it is a lot easier for the transition."

Retention and completion components

Lending library. The lending library makes textbooks and access codes available to students who cannot afford to purchase the materials themselves. NECC believed that by decreasing costs associated with college they will reduce student debt and improve student retention and persistence to graduation. According to NECC administrators, preliminary data suggest that this initiative was quite successful in in terms of retention and graduation rates. Administrators targeted the use of SSA funds in purchasing materials based on previous tracking of student requests that the campus library could not provide. These materials included those for gateway courses such as Anatomy and Physiology I and II, Applied Technical Math, Calculus, and Statistics as well as some books for developmental mathematics courses.

Tutoring, supplemental instruction, and peer mentorship. NECC used its SSA funds to increase academic support for STEM students in Year 2 by expanding the number of courses with supplemental instructors, increasing tutoring hours, and providing targeted support for health professions students. In its

expansion of supplemental instruction, NECC focused on STEM courses that typically draw many STEM majors (e.g., Introduction to Computer Science, Anatomy and Physiology, and Chemistry).

Expanded STEM tutoring hours were offered at NECC's Lawrence campus and were viewed favorably by tutors and students. They reported that many students live in Lawrence and the proximity to tutoring makes it more accessible. One student appreciated that the tutoring time and space allowed her to focus on school work in a way she could not while at home. "Without [the tutors] I would crumble," she said.

"Without [the tutors] I would crumble."
NECC nursing student

SSA funds also enabled NECC to provide targeted support for health-professions students including tutoring for radiology, respiratory care, and dental assisting and an online tutoring module for nursing and allied health. Administrators explained that NECC is a not often in a position to offer tutoring for students in these very specific programs and reported anecdotally hearing that these additions had been helpful.

Students who provided tutoring and supplemental instruction services reported that they also benefitted from these activities. They said tutoring refreshes their knowledge of the subject and most notably, piques their interest in future roles as STEM educators. The tutors expressed their enjoyment in helping their fellow students grasp STEM concepts. One tutor said, "I love seeing the look on students' faces … the enlightenment." Another tutor explained that his work as a tutor helped solidify his interest in being a computer science teacher. He said, "I didn't know what I wanted to do when I came to Northern Essex and that's totally changed since … getting involved with SI [supplemental instruction] .... [It] has just changed my life completely."

"I didn't know what I wanted to do when I came to Northern Essex and that's totally changed since … getting involved with SI [supplemental instruction] .... [It] has just changed my life completely."
NECC peer tutor

Peer mentors supported students in STEM courses on the Lawrence campus to navigate college life issues such as keeping up with homework or attending class. Each peer mentor was assigned a group of students that they were responsible for contacting and supporting. Peer mentors are also used to keep students updated about opportunities such as NECC scholarships, FAFSA workshops, and the chance to attend events like the National Dominican Student Conference.

Technology infrastructure upgrades – NECC's technology upgrades to support teaching and learning included laptop computers for a biology lab and teaching workstations with wireless technology to facilitate student engagement (e.g., a microscope with a camera to which students could connect via WiFi). A biology instructor explained that the laptops allowed students to immediately engage with and analyze data during their lab time, providing a more research-like experience. Many NECC students do not own laptops and previously often struggled to do analysis outside of class in a computer lab without the instructor present. With the laptops, the instructor could also model how to use the analysis software or manipulate the data in class, so that students would be better equipped to examine the data and troubleshoot problems on their own once outside of lab.

Summer "App Inventor" workshops. These workshops were designed to keep current NECC STEM students engaged with the college over the summer and spark an interest in computer science and technology among non-STEM students. Open to current NECC students regardless of major, the workshops were each four-days long and were offered for free three times during the summer. In these interactive workshops, students designed apps for their own devices using an accessible tool (App Inventor) that required no programming knowledge or experience, but did require creativity and programmatic thinking.

Summer calculus boot camp. The calculus boot camp is a free, intensive, two-week long review of concepts for current NECC students.[1] It ran five days per week for four hours per day and included lunch, a free *Calculus for Dummies* textbook, and a calculator on loan. Two mathematics faculty taught eight students in a highly interactive, small group setting. Several students were simultaneously enrolled in NECC's summer session Calculus I or II class.

> *"I wouldn't [be able to] pass the [Calculus I] course without taking the boot camp."*
> *NECC calculus boot camp student*

During our observation of the boot camp, students were very engaged, seemed comfortable with the instructors, and did not hesitate to ask questions. The two instructors alternated between working with the whole group and working more intensively with a couple students at a time. The students also seemed to help one another. The instructors had an engaging teaching style, turning questions back to students and having students work through problems on the board. Several students reported that having access to two different instructors was advantageous because the instructors could offer different approaches to the same problems.

Boot camp students were thankful for the opportunity to refresh their mathematics skills and learn new ways to approach problems. One student commented that the supportive and low-pressure learning environment made it easier to learn the concepts without the performance anxiety associated with for-credit courses. Students overwhelmingly appreciated that the boot camp was free and most felt it boosted their ability to perform in current and future mathematics and STEM courses. One said that concepts from the boot camp were transferrable to biology and geology courses and that it would "give me an edge going into the [science] field." Another student—on track to transfer from NECC to a four-year school in mechanical engineering—said that Calculus II was particularly hard and was glad for the extra help over the summer.

STEM retention scholarships. STEM retention scholarships are available to currently enrolled students to help cover the remaining balance of tuition, fees, books, and supplies after "free aid" is on their account. They are awarded based on a flexible combination of need and merit criteria. The scholarships target students who demonstrate an interest in STEM, show "academic potential," and who are at risk of not attending if their financial needs are not met. They are modeled after existing NECC retention scholarships that have proven to be effective (year-to-year retention figures for students receiving the original scholarship go as high as 70 percent). NECC awarded 24 STEM retention scholarships in the spring and summer semesters of 2015.

Year 3 Plans

In general, NECC administrators were positive about the prospects of their SSA programming in Year 3. Components that they were particularly enthusiastic about included STEM retention scholarships, the lending library, expanded tutoring and supplemental instruction, and the technology upgrades. One NECC faculty member reported that she was interested in bringing more STEM-related guest speakers to campus, including traumatic brain injury advocate Chris Nowinski and naturalist Sy Montgomery. She also wants to start a women in STEM group which would encourage female STEM faculty to engage with students around different career pathways and address barriers to women in the field.

[1] Although targeting NECC students (the Boot Camp was advertised through an email to current students), some of the participating students were enrolled at other community colleges and four-year institutions but happened to be taking summer classes at NECC.

North Shore Community College (NECC)

The SSA program at NSCC is overseen by the Assistant Dean of Math and Science and managed by a part-time coordinator. A primary focus of NSCC's SSA program is a STEM focused dual-enrollment program for area high school students (supplemented with experiential and career-exploratory activities, peer mentoring and tutoring services). NSCC also supports current STEM students with scholarships, tutoring, peer mentoring, mathematics boot camps, and a STEM student club. NSCC's program does not specifically target underrepresented groups; however, their dual enrollment recruitment and outreach programming targets local high schools that have substantial populations of underrepresented students, many of whom are low income or potential first-generation college students.

Year 1 Review

In Year 1, the focus of SSA activities was retention and support of current STEM major students and engagement and recruitment of high school students.

Recruitment and readiness components

- Recruitment and awareness events included early acceptance dinners for potential incoming STEM students, peer mentor outreach, and STEM Career Days.
- A two-credit dual enrollment course, Introduction to Engineering, which targeted area high schools with substantial populations of first-generation and underrepresented students. Students went on field trips to local engineering firms and received support from a peer mentor.
- Free four-week mathematics boot camp for incoming and current developmental mathematics students with modules based on MyMathLab software.
- Initial planning for curriculum alignment in chemistry and other sciences.

Retention and completion components

- STEM-focused orientations for incoming STEM majors, including individual advising, a meeting with the dean and assistant dean of mathematics and science, and consultation with the SSA coordinator. The orientation covered topics including mathematics placement, career opportunities, working while attending college, planning for graduation, and available academic resources.
- Scholarships offered to current and incoming STEM majors with priority given to students who wanted to increase their credit load (i.e., taking a fourth or fifth course during a semester).
- Hiring a SSA coordinator who is responsible for support and guidance of STEM students, outreach in area high schools, and assistance to STEM faculty and staff involved with the SSA program. The coordinator is a person of color who hails from the Lynn community and has computer science expertise and considerable tutoring experience.
- Recruitment and hiring of the first cohort of STEM peer mentors whose primary role was to work closely with student enrollment services in outreach efforts, such as responding to student email inquiries and calling prospective students to let them know what it was like to be a STEM major.

Year 2 Description

In Year 2, NSCC shifted the focus of its SSA programming to concentrate on dual enrollment for area high school students, reflecting the priorities of new college administration. Peer mentors, who provide support to dual-enrollment and current college students, continued to be a central piece of the SSA program. Ongoing support for current STEM students included an SSA scholarship, tutoring support, and assistance from the SSA coordinator. The reorganization of the NSCC administration prompted more regular meetings between Student Affairs and Academic Affairs, which supported the administration and coordination of SSA. Coordinated efforts included professional development for advising staff around STEM-specific concerns (e.g., the need to take a mathematics class every semester) and identifying cooperation oppoutunites between SSA programs and STEM initiatives funded by other grants including TAACCCT 4. For example, a STEM advisor was supported by TAACCCT 4 and SSA funds focusing on "high touch" supports, such as intentional advising, college and career coaching, and contacts with industry. The SSA and TAACCCT 4 grants were also able to synergistically share relationships with industry and employers because the staff of the two grants meet with each other regularly.

> *"We had a lot of fun in our classes and from what I heard from other people, they enjoyed it too. Sometimes it would be hard because of all the tests and work … but given what they learned and could apply in school too, it was something that was really worth it."*
> *NSCC dual-enrollment student*

Recruitment and readiness components

Dual-Enrollment (DE) Courses for High School Students. Students from local high schools were recruited to take STEM courses—including courses in anatomy and physiology, computer science, engineering, and statistics—at NSCC in the fall, spring, and summer semesters of Year 2. NSCC also incorporated experiential activities such as field trips, hands-on projects, career advice, resume building, and speakers in their dual-enrollment courses. Based on experiences in Year 1, SSA administrators developed a mandatory orientation for DE students in Year 2 tailored to their specific concerns and needs as high school students.

DE courses for high school students were free and the textbooks required in the courses were also provided by NSCC at no cost. Students picked up textbooks from an administrator, adding another "touch point" to raise students' awareness of the administrators, faculty, and mentors who were there to support them. In fall 2014, the DE courses were exclusively populated by high school students; however, in the spring and summer of 2015, courses included DE and current NSCC students.

NSCC administrators reported success in terms of recruiting for the STEM DE program, with more applicants than spaces in the fall. Administrators attributed strong participation to an earlier start to recruitment efforts and a positive reception at area high schools. A breakfast event for area guidance counselors in the spring featured a panel of students who were currently taking STEM DE at NSCC and "went over very well." DE students also reported recruiting their peers, saying "we knew our experiences and we thought they'd enjoy it too." Some students returned to NSCC for more DE courses, and returning students were given preference in signing up for those courses.

DE students explained that the experience prepared them for college life and the intensive study of college-level coursework. One student said that DE gave him a head start, noting "[It's] a program where I can learn more and more and more, and actually get ahead of people … because it's actually giving you knowledge about college." Another student noted that taking the college-level courses required hard work and sacrifices, but that it would ultimately pay off, saying, "I knew that going into STEM would help me a lot in the future."

Experiential, career-focused activities were part of the SSA-supported DE program at NSCC. Students felt that these activities were instrumental in helping them learn the course material and discover their STEM-related interests and talents. A student who took a computer-aided design course explained that having the chance to observe and participate in designing a house on a computer was an "awesome experience" because it was relevant to his high school major and his goal of becoming an architectural engineer. Another student reported that he discovered that he wants to become a civil engineer as a result of a construction career day that focused on a green roof design project. "When I went [to the construction career day]," he explained, "I saw how everything was built and was like 'I want to be a part of that.' I want to say to friends or my kids, 'I helped build that.' You feel proud of yourself when you do that—even thinking about that feels good and gets me excited."

UMDI observed one of these experiential opportunities—a service learning activity cosponsored by Girls Inc. and SSA, where about 35 middle school girls from Lynn were brought to NSCC for an activity that involved building model bridges. Eleven students from the Introduction to Engineering class (mostly high school DE students) joined the activity as facilitators and mentors. For these students, the activity was scheduled as the second half of a typical class session. The students knew there would be a service learning activity, but did not know what the specific activity would be in advance.

One or two DE students were assigned to each group of five or six girls. There was limited interaction between the DE students and the visiting girls at first, but the DE students eventually found various ways to engage with the Girls Inc. participants—some by making suggestions and others by assisting with constructio.

The course instructor and the SSA coordinator both said that students would be asked to discuss team work in future class sessions and that they hoped the DE students would learn facilitation skills from the experience.

STEM career days. NSCC held STEM Career Days where invited industry professionals spoke to high school and current college students. These included representatives from Fitbit, Analogic, the Smithsonian, Applied Materials, and Microdata, who spoke to students about their corporations and their careers, and told them whether there are any job openings.

Boot camps. NSCC offered two week-long mathematics boot camps in January before the start of the spring semester using the modularized curriculum from the Year 1 boot camp. The intention of these no-cost boot camps was to get students "up and running before the start of the semester." Unlike the Year 1 summer boot camp, the January versions were focused on addressing "little achievement gaps" instead of getting students through multiple modules. If a student was close to finishing a course at the end of fall semester, NSCC tried to engage them and get them to complete the course through the boot camps.

"When I went [to the construction career day], I saw how everything was built and was like 'I want to be a part of that.' I want to say to friends or my kids, 'I helped build that.' You feel proud of yourself when you do that – even thinking about that feels good and gets me excited."
NSCC dual-enrollment student

NSCC also implemented some free, one-night boot camps that focused on refreshing concepts for people that had not taken a mathematics course in a long time—such as students who had not recently graduated from high school. Food was provided and the SSA coordinator commented that "with this community, [food] really makes a difference …. They were happy, they were excited, they loved the opportunity."

Curriculum alignment.NSCC started the process of developing agreements for mathematics alignment with high schools in their service area. The process was been challenging because it was difficult to get college and high school faculty to come to the table to hash out alignment issues. Also,

working with Lynn Public Schools system was challenging due to the number of schools in the district, teachers' union issues, and questions of who would pay for the alignment work. Despite these challenges, an NSCC administrator said, "We're getting there."

Retention and completion components

STEM peer mentors, tutoring, and supplemental instruction. STEM peer mentors were NSCC students who had successfully completed several STEM classes. They participated in outreach, orientations, guidance, and tutoring for STEM students and generally kept in touch with all students who had experienced any part of the SSA program. The SSA coordinator oversaw the peer mentors and used his connection as a former staff member of the tutoring center to recruit additional peer mentors. Mentors were also identified by other NSCC faculty and staff. Administrators explained that peer mentoring was "the hallmark program" of the SSA initiative at NSCC and, furthermore, was a particularly sustainable program as most mentors qualified for work-study funding.

In Year 2, peer mentors were assigned to a specific STEM program and to a group of students with whom they would touch base regularly through email or by visiting classrooms. Peer mentors would respond to or meet with any student who requested further support. The peer mentoring program was similar to an intrusive advising model: administrators and the SSA coordinator ensured that there were "high touch points" between peer mentors and STEM students at critical periods, such as during add/drop and withdrawal periods, midterm exams, and early alert periods. The SSA coordinator also piloted a supplemental instruction model using peer mentors in Year 2, which he said went well. "All of the students did amazing," he said. "They got mentored, they got help, and they all were successful. All the ones that took advantage of [the supplemental instruction peer mentor] did extremely well."

Peer mentors also commented that students appreciated and regularly used their services—to the point where they were stretched thin because of the amount of student demand. NSCC administrators noted that it was difficult to recruit and retain peer mentors because they had to find individuals who had taken and excelled in STEM courses and had the time and inclination to do the work. There was high turnover because the peer mentors regularly successfully completed their program of study and graduated or transfered.

> *"As I am tutoring I am learning something new. [In] classes that I've taken already, I'd be surprised by a math problem. I'm more willing to learn when helping the student and finding [new] ways to solve problems."*
> *NSCC peer mentor and tutor*

According to peer mentors, the job was beneficial to the mentors themselves. They commented that it reinforced their STEM knowledge and skills and helped them appreciate different approaches and learning styles. For example, a mentor noted, "As I am tutoring, I am learning something new. [In] classes that I've taken already, I'd be surprised by a math problem. I'm more willing to learn when helping the student and finding [new] ways to solve problems." The SSA Coordinator reported that mentors have reported changing their professional trajectories because of their experience helping STEM students, often considering going into teaching in a STEM field.

In addition to expanded peer mentoring, NSCC administrators also increased a mix of STEM peer and professional tutoring at the tutoring centers on the Lynn and Danvers campuses beginning in the fall semester. The increase was intended to meet the needs of the 75 high school students in dual-enrollment courses and included tutoring center hours that were appropriate for the high school population (e.g. between 4 and 7 p.m.).

STEM-focused orientations. In Year 2, NSCC increased "front end" support and contact with incoming students. Incoming students were required to attend an orientation where they and their parents could find out more about the college's STEM programs and meet administrators, staff, and peer mentors who were part of a network of support. The SSA coordinator maintained a contact list of these STEM students, emailed them about upcoming STEM-related events, and ran a "phone-a-thon" to remind current and incoming STEM students to register for classes.

STEM club.The Stars of STEM club helped STEM students as they prepared for the transition from NSCC to a four-year college or career; raised funds to support STEM students in need of financial assistance; and boosted awareness of STEM-related careers, majors, schools, internships, and volunteer job opportunities. The SSA coordinator also used the Stars of STEM Facebook page to get the word out to students about STEM opportunities.

SSA scholarship program. In the spring, SSA offered competitive scholarships to STEM students who were already signed up for nine credits and who were looking to add another four-credit STEM class to their course load. Scholarships were also available for students looking to take a STEM class over the summer. Students applied by writing an essay. NSCC decided not to offer the scholarship in the fall because incoming students in that semester had many more scholarship opportunities. NSCC administrators considered the scholarship to be a successful practice and reported that most students who received the SSA scholarship in Year 1 have graduated.

Year 3 Plans

NSCC administrators were generally optimistic about the direction of their program in Year 3—particularly in regard to the effectiveness of peer mentoring. They also envisioned further synergies between SSA and TAACCCT 4 as well as other grant-funded STEM initiatives. NSCC administrators were eager to use lessons learned in Years 1 and 2 to make a number of expansions and tweaks to SSA programming in Year 3. These plans are summarized in "recruitment and readiness" and "retention and completion" categories below.

Recruitment and readiness

- ***Elimination of free textbooks for dual enrollment students***. Dual enrollment will likely continue as a central feature of NSCC's program; however, administrators anticipate that they may eliminate the free textbook program, which is costly and time-consuming.
- ***Increased support for dual-enrollment students***. NSCC plans to introduce more peer mentors and "high touch" experiences where students frequently interact with STEM faculty, staff, and peers.
- ***Expanded and adjusted mathematics boot camps***. Administrators are considering keeping the module-based boot camps and/or "one-nighter" sessions for current and dual-enrollment students, and possibly adding a non-modular boot camp for students who need developmental mathematics.

Retention and completion

- ***Enhancing internships, job shadowing, and job placement.*** In collaboration with other STEM-related grants, SSA administrators plan to develop internships and job shadowing opportunities, build "non-credit to credit" pathways, and develop certificate programs. They may also formalize

a process to coordinate with the co-op program to match students with job openings and prepare them for interviews.

- ***Expanding academic supports***. Based on a successful pilot, NSCC administrators anticipate introducing supplemental instruction as another form of STEM student support. They hope to "free up" the peer mentors to focus more on relationship building with STEM students than tutoring.
- ***Expand supports for biotech and health students***. These students are primarily located on the Danvers campus, where NSCC is hoping to make STEM support more visible. A Massachusetts Life Sciences grant is expected to infuse sustainable resources like lab equipment for biotech students affected by the SSA program.
- ***Modification the SSA scholarship program***. For Year 3, the funding may be split into two pools. The first pool would continue to be for students taking nine credits the following semester and who want to take an extra course. The other pool would be for students who make it "half-way" through their program, with about 35–40 credits, and who are trying to finish.

Mount Wachusett Community College (MWCC)

The SSA programming at MWCC is administered by the Assistant Dean of the School of Business, Science, Technology & Mathematics with considerable involvement from other departments and divisions. A STEM recruiter and STEM advisor help to coordinate and manage SSA activities. There are two central components to MWCC's SSA program: (1) a summer academy – a free, intensive STEM-preparatory program for recent high school graduates, adult learners, and current students who agree to enroll in one of MWCC's STEM programs in the fall semester; and (2) Math Modeling – a college-mathematics readiness program for area high school seniors. MWCC has also used SSA funds to offer STEM awareness events for high school and currently enrolled students and has purchased science and mathematics equipment. MWCC's summer academy has a substantial focus on underserved individuals; 70 percent of those served in Year 1 were first-generation college students, 57 percent were low income, 30 percent were non-white, and 26 percent had a disability. The Math Modeling program is not specifically targeted to underrepresented populations; however, it does reach many low income high school students who live in an economically depressed region.

Year 1 Review

In Year 1, the SSA activities primarily focused on recruitment and readiness activities for incoming and high school students.

Recruitment and readiness components

- STEM Awareness Event – Over 200 high school seniors and teachers participated in a STEM Majors Fair, presentations by the chemistry and health occupations faculty, and financial aid/financial literacy workshops. The event was designed to increase awareness of STEM fields and convey the affordability of community college education.
- STEM Starter Summer Academy – a rigorous seven-week academic program where high school students who agreed to matriculate in fall 2014 were enrolled in two college-level classes, participated in community service, received tutoring and advising support, and were given a stipend. Twenty-two of the 23 academy students matriculated that fall.
- Math Modeling – a college-readiness mathematics initiative for over 300 high school seniors in two area high schools.

Year 2 Description

Again in Year 2, the main SSA program components at MWCC included the Summer Academy and Math Modeling initiative. Administrators made strategic adjustments to the Summer Academy based on Year 1 data, student feedback, staff reflection, and multiple meetings. Changes included reducing the session from seven to six weeks, incorporating a more defined service learning activity, and giving students the option of taking one or two college classes. The Year 2 STEM Awareness Day was similar in content to the previous year but had a smaller and more targeted audience. MWCC also purchased equipment and software to support STEM-related library resources and to improve engagement in STEM classes.

Recruitment and readiness components

Summer academy. MWCC's Year 2 Summer Academy's format was largely similar to that offered in Year 1 and aimed to improve college readiness, build self-reliance and academic skills, and foster relationships with peers, staff, and faculty. The first week of the six-week program consisted of mandatory orientation activities, including field trips, speakers, stipend paperwork, and a spatial awareness workshop. The remaining five weeks included one or two free college-level courses, free textbooks, daily mandatory study periods, a community service activity, and tutoring. Participants received a stipend if they attended the required Summer Academy activities, complete a time sheet, and sign in and out each day. In Year 2, the service-learning project was changed from an intensive, summer-long project to a circumscribed service activity that was part of a larger MWCC initiative (Leadership Academy), allowing SSA students to meet other members of the college community. Also different in Year 2, SSA students participated in regular summer-session classes with non-SSA students. In Year 1, course sections were offered specifically for SSA students, with some tuition-paying non-SSA students also allowed to attend.

The Summer Academy was open to recent high school graduates and adult learners who placed into English Composition and Intermediate Algebra or higher, and who committed to enroll in one of MWCC's STEM programs in fall 2015. Current community college students with limited credits were also eligible if they could show that the Academy would "keep them on track." The Year 2 cohort of 20 students were primarily traditional recent high school graduates, but also included armed services veterans, Gateway to College participants, and a few single parents. When recruiting students, MWCC prioritized clear messaging and reinforcement of the program's rigor and expectations in order to bring in students who were committed and had the best chance to succeed. Prior to the start of the Summer Academy, every accepted applicant had a one-on-one conversation with the SSA recruiter, both to screen for students who would most benefit from the academy and to emphasize the level of commitment that the program required.

Summer Academy participants received a stipend that was uniquely large among the SSA grantees (up to $1,750). It was also uniquely administered through a payroll system. Students had to sign an employment contract during the orientation and fill out weekly timesheets in order to collect their stipend. Participants also had a contractual obligation to matriculate in the subsequent fall semester (with the consequence of having to reimburse subsidized summer tuition and fees). MWCC offered participants in Year 2 the choice of enrolling in just one course and earning a "half-stipend" as an alternative to the two courses and full stipend in an effort to reach more students, "stretch" available stipend money, and provide a less intense option.

Administrators believed that the stipend and the associated payroll paperwork reinforced a sense that the Summer Academy was on par with having a job. They also felt that, without the financial support of the stipend, many students would not be able to attend. The Dean of Mathematics and Sciences explained that

the stipend "makes something accessible that might not otherwise be accessible" at an economically depressed time in an economically depressed area. The dean continued, "This makes a big difference for opening doors for people who might not have an open door. [They have] never seen one. They might have been climbing through windows or over roofs but they never had a door open and [the stipend] makes it much better for them."

> *"Through [the Summer Academy] I got to meet other new people and I found connections, and knew what schools would be better for me to apply to for transfer. Now I'm transferring, so I feel like [it was] a chain reaction. It leads to one thing and that leads to another thing."*
> *MWCC Summer Academy student*

Generally, students felt that the summer program was demanding, but also included the kinds of supports they needed to succeed. A Year 2 cohort student explained that the program was intensive and "a lot to take in because … sometimes [they] have class for five hours a day." The accelerated pace of summer coursework also meant students were regularly asked to demonstrate what they had learned—as one student noted, "Every single class we have we have at least a quiz or a test." However, a student from the Year 1 cohort assured the Year 2 cohort that the rigorous classes would pay off: "In some ways that [rigor] is going to be a good thing … because when you switch to regular classes it's going to feel like, not slow, but so managable. [The academic year] is no where near as intense as what you did in the summer."

Students felt that the supports for building the skills they needed to deal with this intensity were effectively infused into their courses. For example Biology 113—an introduction to college-level science course open to Summer Academy students—was "front loaded" with college success skills, including study skills and strategies for different types of learners. The instructor also incorporated some informal advising before and after class as well as discussion about careers, including discussing the instructor's own career in industry.

During UMDI's observation of this class, the instructor was actively engaged with students, moving about the lab classroom to check in and answer questions as groups of students worked to build models of carbohydrates. These interactions just as often included support for study skills as for course content. Similarly, during an observation of an Algebra II course when students were doing some independent work, UMDI observed that the mathematics instructor was actively monitoring students' abilities to complete problems in the MyMathLab platform. He seemed to adapt his approach for both students who readily asked questions and students who were more reluctant to ask for help.

> *""I guess I'm getting broken into the fact that you have to do a lot of independent work. I didn't have to do too much of it before college … Now, I'm getting into the fact that you have to spend hours a week and seek outside help. I think getting used to that is good because all I hear about college classes is 'Man I have to do so much work'."*
> *MWCC Summer Academy student*

The combination of in-class and out-of-class support taught students to independently take charge of their academic career, according to Summer Academy participants. One Year 2 participant said, "I guess I'm getting broken into the fact that you have to do a lot of independent work. I didn't have to do too much of it before college … Now, I'm getting into the fact that you have to spend hours a week and seek outside help. I think getting used to that is good because all I hear about college classes is 'Man I have to do so much work.'" Time management was viewed as a particularly salient skill. Mandatory study time provided students with the opportunity to independently determine and seek out the supports they might need. In Year 1, the tutors came to a designated room where students were required to spend their study time. In Year 2, students were encouraged to go to the library or tutoring center during study time and seek out the resources that they needed. Students reported that they were generally afforded with whatever assistance they needed. One student explained that the model for support and resources was "ask and you shall receive."

In order to encourage peer-to-peer support, the Summer Academy implemented a robust cohort model. Students participated jointly in an intensive orientation week, spent their mandatory daily study time together, and sometimes were in the same courses. Most students said that it was helpful to take classes with other students from their cohort because they could turn to their peers for help. "We work with each other and help each other out," one student explained. "If I don't understand something I can ask one of them to help me." Another student noted that there were advantages to reaching out to a student in the Summer Academy cohort as opposed to a regular classmate; "It's because you see them and interact with them every day. So you learn best with them because you catch [on] faster than if there's a distance and you don't see the person enough." Three students from the Year 1 cohort agreed that they had maintained a sense of community during the academic year by studying together and seeing each other socially. Both cohorts of students felt that a shared sense of purpose brought them together to support each other; as one student commented, "You have the same goals. You're all shooting towards the same thing."

> *"It was the best part ... Just looking at those people at the peak of their career. They are a living example for you. It just motivates you a lot. It motivates me a lot and gives me energy to start differently. And get the motivation to give your 100% to get to that point. It was an amazing thing."*
> *MWCC Summer Academy student*

Students also developed beneficial relationships with faculty and staff, including with the recruiter, whose role in the summer was to work closely with students to redirect them to tutoring or to facilitate conversations with instructors about difficult assignments. A student from the Year 1 cohort explained that forging these connections was helpful in planning his post-MWCC education: "Through [the Summer Academy] I got to meet other new people and I found connections, and knew what schools would be better for me to apply to for transfer. Now I'm transferring, so I feel like [it was] a chain reaction. It leads to one thing and that leads to another thing." Students were enthusiastic about the professors' responsiveness and assistance in regard to effective studying and time management. When students said they were struggling with material, a biology professor immediately set up after-class time with her teaching assistant for them. Some professors would provide study guides before exams so that students knew where to focus their attention, or they would review concepts that students struggled with on exams. Professors were also reportedly proactive about discovering and adapting to students' learning styles.

Students particularly appreciated the four field trips they took during orientation week. One student underscored that the trips were a chance to see role models in action: "It was the best part ... Just looking at those people at the peak of their career. They are a living example for you. It just motivates you a lot. It motivates me a lot and gives me energy to start differently and get the motivation to give your 100 percent to get to that point. It was an amazing thing."

Math modeling. The Math Modeling program aimed to get high school students ready for college-level mathematics. The program is taught by high school instructors at four local high schools who use MWCC-generated curriculum focused on teaching developmental mathematics through "modeling" applications. The program was paid for through a unique integration of multiple funding streams. SSA funding provided a course release for a mathematics faculty member to assist high school teachers who were implementing the Math Modeling curriculum. This faculty member was in constant contact with the four schools, had monthly meetings with each high school, and traveled to the high schools as needed.

During the 2014–15 academic year, Math Modeling served over 300 students, 72% of whom were college-ready in mathematics by the end of the school year. An administrator noted that many students appeared to shed their fear of mathematics by participating in the program. Despite considerable outreach efforts, including phone calls and direct mail, relatively few Math Modeling students matriculated to MWCC and/or participated in the Summer Academy. Administrators explained that the low rate likely

reflected that the program was offered to all students in the partner high schools, not just students who were interested in STEM careers or attending MWCC. As a result, MWCC administrators planned to shift the program's focus in Year 3 to include supporting students with college applications.

STEM awareness day. As in Year 1, this event featured career-focused STEM presentations and financial aid / financial literacy workshops. A Year 1 Summer Academy student also spoke at the event. For the Year 2 event, MWCC opened up registration to current MWCC general studies and liberal arts students in addition to the high school seniors targeted in Year 1. While administrators were pleased that the Year 1 STEM Awareness Day was well attended, they were not satisfied with the engagement of attendees—many were simply not interested in following the STEM pathway. The Year 2 event was smaller, but all students who were recruited and registered had demonstrated a clear interest in STEM or a desire to know more about science and mathematics majors.

Retention and completion components

Purchase of STEM technology and equipment. MWCC purchased equipment for physics, biotechnology, automotive technology, computer science, health occupations, and mathematics programs. This included an emulator that allowed students to see a professor's calculator keystrokes projected onto a screen. The library added an area dedicated to mathematics where students could access tutoring services and 21 all-in-one computers loaded with calculator and Mathematica software. Mathematics modeling and graphing calculator software were also installed on classroom computers.

Academic year preparation and support for summer academy participants. In Year 2, MWCC did not offer a formal support structure for 2014 Summer Academy participants. In fall 2014, MWCC used SSA money to fund a STEM advisor who remained in touch with the Year 1 Summer Academy cohort into the academic year; however, 9c cuts forced the college to eliminate that position in the spring. Thus, Summer Academy students merged into the normal student population during the academic year, but had access to campus-wide supports, including tutoring, advising, and career services.

Despite being "mainstreamed" into the typical student experience during the academic year, most Summer Academy students have persisted. Administrators reported that 20 of 22 Year 1 Academy participants remained enrolled from the fall 2014 to the spring 2015 semester. As previously noted, students from the Year 1 Summer Academy reported that the connections developed with each other, faculty, and staff as well as the skills they built in the academy made academic year studies more manageable. Program administrators and coordinators reported remaining actively engaged in supporting SSA students; for example, they encouraged students to seek out resources such as an NSF grant-funded scholarship that many Summer Academy students applied for and received.

Year 3 Plans

MWCC administrators and faculty were positive about the outlook of their SSA programming in Year 3 and anticipated future synergies with programs like Complete College America, GPS in STEM, NSF funding, and the TAACCCT 4 grant. They felt that their recruitment efforts were largely "on target"; however, they were considering reaching out to more industry representatives for future STEM Awareness Days and similar events. Additionally, while largely satisfied with the Summer Academy and Math Modeling, the administrators anticipated continuing to adapt each of these programs. For Year 3, MWCC has prioritized hiring a STEM advisor so that students exiting the Summer Academy and entering the academic year at MWCC will have dedicated guidance.

Administrators were in the process of adding more high schools to the Math Modeling program and, as discussed above, expanding the goals of the program to include support for students in the college

application process. Math Modeling high school teachers reported that students were not applying to and attending college because they did not know how to fill out the forms and get financial aid. MWCC administrators were working with these teachers to understand how to best assist these students. MWCC administrators a said they would like to increase the number of Math Modeling participants who enroll at MWCC. Administrators and faculty also said they wanted to create a program tailored to Math Modeling students who do attend MWCC. This program would acknowledge students' high school work, offer them continued mathematics tutoring, and keep them on track to graduation.

Roxbury Community College (RCC)

The SSA program at RCC is overseen by the Vice President of Academic and Student Affairs. In the second year of the grant, the Dean of Arts and Sciences managed the SSA program's Summer STEM Academy. A faculty member serves as the Summer STEM Academy's academic program director. RCC's summer program uniquely focuses on younger high school students (9th and 10th graders) who are predominantly students of color. The college also uses SSA funds to publish its *CareerFocus* magazine, which serves as a recruiting tool and provides information about STEM fields, education, skills, and employment to residents in RCC's service area, many of whom are underserved.

Year 1 Review

In Year 1, the focus of SSA activities was recruitment and readiness of high school students as well as generating awareness of STEM careers and STEM programs offered at RCC.

Recruitment and readiness components

- ***High school recruitment***. Recruitment activities included breakfast events with local headmasters and school counselors, college and career days at the college, and events that target approximately 200 students at Madison Park Vocational Technical High School, including presentations on allied health careers, a motivational speaker, and a crime scene investigation simulation designed by RCC faculty.
- ***Summer STEM academy***. A free, five-week program for Madison Park Vocational Technical High School students linked to the RoxMAPP initiative.[2] The academy primarily served rising juniors and seniors, but also served some recent graduates. It offered basic skills prep in mathematics and science (including Accuplacer test prep); STEM exploration activities such as hands-on labs, simulations, and field trips; extra tutoring and advising; and paid job-shadowing internships. Students were paid an hourly stipend for participating.
- ***Instructional materials purchases***. Purchase of instructional materials, including tablet computers that were loaned to Summer STEM Academy participants.
- ***Publication of* CareerFocus *magazine***. The magazine is designed to enhance awareness of STEM careers and the related programs available at RCC. It was sent to the 80,000 households in the RCC service area and was published in print and electronic form. The magazine contained articles and information about career preparation, financial aid, jobs in the local community, starting salaries, and academic expectations. SSA funding was leveraged with other funding to support this publication.

Year 2 Description

[2] RoxMAPP is a partnership between the City of Boston and the Commonwealth to provide Madison Park students with pathways to careers and higher education.

In Year 2, RCC continued to focus its SSA program on recruitment and readiness of high school students primarily through its Summer STEM Academy. Administrators made several significant alterations to the academy in the second year of the grant: RCC targeted younger students, recruited students from additional high schools, expanded the number of participants, and offered non-credit courses in six subjects (physics, chemistry, biology, mathematics, computer science, and robotics). The academy did not include internships in the second year but did incorporate several field trips. To emphasize that the summer program was fun, administrators and faculty reframed it as a STEM "Camp" in Year 2. RCC also continued to use SSA funds to publish two more issues of its *CareerFocus* magazine.

Recruitment and readiness components

Summer STEM camp. In Year 2, the Summer STEM Camp primarily served 9th- and 10th-grade students as well as some incoming high school freshmen. Administrators strategically changed the targeted age range to "plant the seed earlier" and to focus on students with fewer competing demands on their time. In addition, administrators hoped these students would return to campus for a second summer to participate in more advanced STEM work. RCC also dramatically increased the size of the academy; participation increased from about 10 primary participants in Year 1 to 77 in Year 2. Administrators attributed the success of their recruitment efforts to expanded outreach beyond Madison Park Vocational Technical High School and direct-contact recruiting with parents and community institutions—particularly local churches.

Students who applied to the program had to complete an application and provide a recommendation from one of their teachers. While students' grades were considered, administrators did not limit the academy to only high-achieving students. They were interested in identifying all participants who were interested and invested in learning. Participants were also expected to maintain appropriate behavior; if they failed to do so, they were asked to leave the academy by the academic program director.

> *"[The hands-on activities] increase their interest in STEM … because some of these kids … want to do STEM careers but they have never been exposed to the real activities, the real lab activities that way. It can catch their interest and they know what it takes to be doing science."*
> *RCC Administrator*

The academy ran for five weeks, Monday through Thursday from 8 a.m. to 2 p.m. Students were divided into three groups of about 25 and rotated through non-credit,[3] ungraded classes in chemistry, biology, and robotics in the morning and physics, mathematics, and computer science in the afternoons. Field trips were held on Thursdays. Students were provided with breakfast and lunch daily and were offered a $300 stipend for participation and completion based on strict attendance requirements. Administrators believed that even without the assignment of grades, students were motivated to pay attention in class because they knew the content would help them get ahead in their future high school and college classes. Teaching assistants (TAs) also reported that students were motivated to stay engaged by the desire to improve their future education and career prospects.

The classes, curriculum, labs, and other activities included in the summer program were developed by faculty specifically for the Summer STEM Camp and focused on experiential learning and engagement. In the robotics class, for example, students worked in teams to design, build, and program a robot, then competed within each class for a spot in a cross-class competition to be held later that week. Teams were judged on how well they met certain predetermined criteria, their robot's ability to perform accurately during the competition, and their team's creativity. TAs reported that students built confidence in this

[3] A special articulation agreement with RCC allowed Madison Park High School students to receive some high school credits.

interactive environment. One TA said, "I've noticed them interacting more as the program is moving along. They're raising their hands. Their making solid proposals, argumentative statements, educated questions that can pose a debate. They're interacting a lot more with the professors about what's going on. Getting a lot of things from it."

Field trips were another experiential component of the camp and helped to forge relationships among students who were drawn from several different schools. The administrators sent the group to a ropes course during their first week as a team-building activity, which students reportedly enjoyed. Students spent a lot of time in their groups, moving together from class to class. A lot of the classroom activities UMDI observed seemed team-based, and faculty commented on how well students built friendships even though they did not know each other at the beginning of the program. Students told UMDI that friendships they made were one of the best parts of the program. To promote peer connections during and after the camp, RCC created a Facebook page so students could keep in contact with one another.

> *"I've noticed them interacting more as the program is moving along. They're raising their hands. They're making solid proposals, argumentative statements, educated questions that can pose a debate. They're interacting a lot more with the professors about what's going on. [They are] getting a lot of things from it."*
> *RCC Summer STEM Camp TA*

Each group of STEM Camp students was supported by a TA who was a current RCC student. TAs followed students on their rotations through different classes and with different faculty, and also chaperoned field trips and monitored students at lunch and other breaks throughout the day. TAs reported that their role was to make sure students were being productive and respectful, getting the work done, and actually understanding the content. TAs supported students socially and academically, talking with students about their education, career plans, and working hard in class. "[We] talk to them about having a clear vision on your life. It's not all fun and games. Let's get it done—wake up. That's when they started improving the work that they were doing in class. They were getting assignments done half way, and now they're completing [them] faster" a TA reported. The TAs also explained that they actively encouraged students to engage in peer-to-peer learning. For example, when a TA observed that some students were struggling with a mathematics topic and could not catch on to the professor's instruction, she paired the students who were struggling with the students who were the most confident in the material. Administrators believed that the program "could not be done without the TAs" because they played multiple roles and formed strong connections with the participating students.

In addition to the TAs and their peers, SSA camp students had the support and mentorship of faculty, administrators, and staff. The program director, a chemistry faculty member, met individually with students every afternoon in addition to ongoing check-ins throughout the day. During our observation, she was in constant conversation with students as she took us around, answering their questions, checking in about a hardship, and reminding them of the rules. Other faculty also built relationships with students. The chemistry professor started the camp with one-on-one conversations with each student to discover how they learn. The biology professor also works in the advising department part of the time and incorporated advising into the classroom.

Administrators and faculty believed that RCC was well suited culturally to cater to the needs of students of color, international students, and underserved students. The professor who offered the Summer STEM Camp biology class said that RCC is an ideal institution to offer STEM awareness and college readiness programs to underserved youth and students of color because it is essentially a HBCU (Historically Black College or University). Administrators explained that many camp students were from households that have recently immigrated and that RCC, with a high international student population, offered supports for "home language issues" and had faculty that were used to "working with different cultures." Parents from

distant cities like Taunton were willing to drive their students a long way to attend the Summer STEM Camp because they knew that RCC "will take care of them." TAs, all of whom were also students of color, said they enjoyed working with the camp participants because it was "refreshing" to see young students of color defying stereotypes. It was gratifying, they said, to see students demonstrate their academic skills and succeed in the program. One TA said, "When you have your people getting the work done and understanding and telling you what they want to do …, saying, 'I learned how to do this! Want me to show you?,' …. it's very rewarding. I'm happy every day."

Administrators reported that most students demonstrated a commitment to the program and few had any substantial behavioral issues. The program director believed a strong indicator of students' dedication and the success of the program was that the student attendance ranged from 85 to 95 percent over the course of the summer session. She laid out very clear rules, made it clear that students could be dismissed from the program if there were infractions, and explained that the rules were tied to their future success. "When they set their feet on this campus, I say, 'This is college. You are responsible for your actions,'" she said, adding, "'Your future starts now. Not tomorrow.'" TAs also reported that students largely fell in line and took the camp seriously. One TA said that sometimes she could see that students were not happy to be inside in the early morning during the summer, but that they generally came to enjoy the classes, activities, and field trips. Moreover, she believed that students would really come to appreciate what they were gaining in the camp after it ended. "When the program is over, that's when everything is going to hit them, when everything is going to dawn on them," she explained. "They might not be able to apply it to anything right now, but later it's going to come into play for them."

> *"They're getting it done and [saying] 'I learned how to do this! Want me to show you?' They are very excited about that. It's very rewarding. I'm happy every day."*
> *RCC Summer STEM Camp TA discussing the Summer STEM Camp's impact on participants*

CareerFocus *Magazine.* RCC used SSA funding to contribute to the publication of two additional hard-copy and electronic issues of the magazine in December 2014 and June 2015. *CareerFocus* continued to spotlight RCC programs and faculty, provide tips to job seekers, and describe different STEM and non-STEM fields and professions. The December issue highlighted RCC's radiology program, profiled an RCC biology professor who works in the pharmaceutical industry, and featured STEM-related careers in transportation and construction. The June issue covered RCC's development of a clean energy program, discussed transfer options to four-year institutions, and featured RCC's phlebotomy technician training program, including a profile of an alumna working as a phlebotomist.

Year 3 Plans

RCC administrators felt that the Summer STEM Academy and Math Boot Camp components of their Year 2 SSA program were successful. They reported that the software purchased for the boot camp will remain as a resource in the college's mathematics lab. They anticipated using the software in future boot camps and incorporating it into the Year 3 Summer STEM Academy—particularly for the older, returning students. RCC also intended to continue to publish its *CareerFocus* magazine, with any non-STEM-centered issues to be paid for with other funds. Notably, administrators were considering significant changes and enhancements to the Summer STEM Academy, which are summarized in the bullets below.

- ***Increase and diversify Summer STEM Academy participation.*** RCC administrators would like to increase the number of academy participants to 100–125 students in Year 3. The larger cohort would be split into two groups. The first group would consist of high school freshman and sophomores who would be introduced to foundational STEM concepts and participate in STEM field and career awareness activities. The second group of juniors and seniors would focus on

more advanced STEM content and engage in college and career planning activities. For this latter group, administrators planned to recruit students who participated in Year 2, but admissions will be competitive. First-time applicants will be screened by the criteria similar to that used in Year 2.

- ***Provide individualized advising to participants who are rising seniors***. Administrators believed that it would be beneficial to connect participants who will graduate high school in the next academic year with a specific advisor who could discuss and plan their future education and career pathway.
- ***Reincorporate internships in the summer STEM academy***. Administrators plan to include internships in Year 3. They are particularly interested in placing students in local research facilities such as the MIT labs.
- ***Expand experiential activities***. The third year of the academy, especially the more advanced program, will possibly include more hands-on experiences, including dissection in biology labs and visits to Boston-area college campuses.
- ***Provide an overview of RCC academic supports and programs to academy students*.** Administrators would like to devote a day of the academy to introducing students to resources available to students enrolled at RCC. They want professors and alumni to talk about the community college experience and department representatives to describe the nursing, biotech, and engineering programs. Possible topics include the advising process and services, applying for financial aid, and the importance of students' GPAs.

UMASS DONAHUE INSTITUTE • APPLIED RESEARCH & PROGRAM EVALUATION

STEM Starter Academy
Year 1 Site Report Analysis, May 2015

Prepared for the Massachusetts Department of Higher Education

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Introduction

The Massachusetts Department of Higher Education (DHE) awarded STEM Starter Academy (SSA) grants to each of the 15 community colleges in Massachusetts for FY14. The SSA initiative aims to support community colleges' efforts to inform, engage, recruit, retain, and graduate significantly more students and enhance their success in STEM pathway programs leading to job placements or college transfer. An additional priority for the initiative is for campuses to identify student support service and activity gaps and/or capacity-building opportunities that can be addressed through replication of currently available programs or through collaboration across campuses.

DHE offered a request for proposal to each of Massachusetts' 15 community colleges in fall 2013. The community colleges subsequently collaborated to submit a joint proposal for funding. DHE approved the joint proposal and awarded each campus funds for FY14 to support SSA activities. The initial disbursement of funds occurred in January 2014, and the original deadline for expending FY14 funds (June 30, 2014) was subsequently extended to December 31, 2014. Year 2 SSA activities began in July 2014, so there is some overlap between Year 1 and Year 2. For simplicity, the time period from January 2014 the end of December 2014 is referred to as Year 1 of the SSA initiative.[1]

The UMass Donahue Institute (UMDI) is conducting the evaluation of the SSA initiative. In collaboration with DHE, UMDI developed an Annual Site Report template for SSA. After vetting the template with SSA sites, UMDI distributed the template to SSA administrators and staff at each site via email on October 29, 2014, with an initial due date of December 5, 2014. FY14 reporting deadlines precluded the incorporation a full analysis of these annual site reports in UMDI's Year 1 Annual Evaluation Report (hereafter UMDI Evaluation Report) of the STEM Starter Academy.[2] The primary purpose of the current report is to provide formative feedback to DHE based on the data in the Year 1 site reports that augments the analysis and information presented in the UMDI Evaluation Report.

All 15 sites submitted annual site reports, which ranged in length from 8 to 47 pages. The average length was 17.5 pages. Some site reports included photographs of SSA students and activities, survey responses, quotes from students, and data from campus tracking systems. The level of detail provided in the reports was quite variable, with some sites listing minimal bullet points (e.g., "held math boot camp") and other sites including multi-paragraph descriptions.

The findings from the Year 1 site reports parallel what was reported in the UMDI Evaluation Report. Therefore, in the current report, UMDI evaluators made an effort to avoid duplicating the content of the UMDI Evaluation Report while adequately capturing the information available in the site reports. For some themes, the site reports contained more details about SSA programming than were available in other data sources used for the evaluation. Those additional details have been summarized and captured here.

[1] Analysis of data collected during fall 2014 relevant to Year 2 activities will be included in the Year 2 report.
[2] See the full report on the DHE STEM website: http://www.mass.edu/stem/initiatives/stemacademyevaluation.asp.

Methods

This report includes information collected through the SSA Annual Site Report template (Appendix L1). The template contained primarily open-ended questions soliciting site administrators' descriptions of and reflections on their SSA programs and activities in Year 1 and their plans, budgets, and goals for Year 2.

SSA site representatives had completed an online survey about their institutions' spring and summer 2014 SSA activities on October 3. The survey contained some items relevant to the annual site reports. To facilitate the completion of the annual site reports and to ease the evaluation burden on the sites, UMDI repackaged each institution's responses to the survey and returned them to the sites along with a "crosswalk" document that outlined which portions of the survey responses might be relevant to each of the report sections (Appendix L2).

To account for the overlap of Year 1 and Year 2 funding, DHE and UMDI asked sites to focus their reporting on their spring and summer SSA activities while only providing an overview of their fall activities to the extent it was practical.

The timing of annual site report submission was affected by 9c budget cuts to FY15 SSA funding. These cuts were announced to sites on a November 20 grantee conference call and required quick submission of revised budgets. With this additional deadline, DHE proposed that only the first section of the annual site reports (reflecting on Year 1) remain due on December 5, with the second section (describing planning for Year 2) due by the end of December.

DHE forwarded site reports to UMDI as they were submitted and UMDI packaged these reports by lightly editing for typos and standardizing the formatting to increase readability. The content of the reports was otherwise unaltered. UMDI analyzed the annual site reports using the NVivo 10 software.

Overview

The organization of this report loosely follows the organization of the site report template, which is divided into Year 1 and Year 2 sections. This report begins with a review of the successes, challenges, benefits, and cross-cutting considerations that emerged from Year 1. This is followed by two subsections containing details about spring and summer activities, goals, successes, and participation. A section on sustainability efforts concludes the section on Year 1. The final section of the report captures a brief summary of sites' plans for Year 2.

The report template asked sites to share highlights of students' experiences in SSA programs. This rich data is difficult to summarize and is instead presented in its entirety, lightly edited in Appendix L3.

Year 1 Review

Data in this section of the report were drawn from the "Section 1: Year 1 Review" portion of the Annual Site Report template and have been organized into the following divisions: Overview, Cross-Cutting Considerations, Spring Activity Detail, Summer Activity Detail, and Sustainability.

Overview

In their annual site reports, sites were asked to provide a summary of Year 1 activities (January–December 2014) that were funded partially or fully through the SSA grant. Sites were asked to include reflections on the main successes with the implementation of their STEM Starter Academy grant to date, the main challenges with the implementation of their STEM Starter Academy grant to date, and the most significant benefits for their institution as a result of STEM Starter Academy activities to date. Their responses are summarized here.

Successes

Many of the successes described by sites in their annual reports echoed those described in the UMDI Evaluation Report on Year 1 SSA implementation. These successes included effective recruitment, high completion rates, internal collaboration, and expanded institutional capacity (e.g., additional staff and student support services).[3] In their site reports, SSA administrators touched on a few additional themes, which are reported here.

Development or integration of novel or improved courses, pedagogies, and course design strategies. Half of the sites mentioned successful collaborative course development, new STEM courses and programs, increased integration of experiential learning and contextualization, enhanced alignment with industry standards, and improved quality of instruction.

> ***Examples:*** Holyoke CC developed a "Pre-STEM" curriculum (covering developmental reading and writing contextualized for health and sustainability studies) using a collaborative approach with faculty from three different programs designing and teaching the course. MassBay CC improved curricular alignment with industry-standard certifications and programs. Quinsigamond CC developed and offered their first section of a STEM-contextualized mathematics course. Several sites developed and offered hands-on, student-centered experiences incorporating mathematics and science in experiential ways.

Increased awareness and integration of STEM programs *across campus*. About a third of site administrators reported an increased awareness of SSA and STEM programs more generally among staff and faculty who had not previously been engaged with STEM programs. This increased awareness often led to better integration of recruitment and support services for students, as well as opportunities to align resources from the SSA grant with other ongoing programs at the colleges.

> ***Examples:*** Bristol CC's incoming students participated in first year registration advising sessions, supported by a Performance Incentive Fund grant. At these sessions, advisors informed students about SSA programs as well as other STEM programs. Springfield Technical CC's SSA program has partnered with their TRIO program to pursue a grant and to align support for

[3] Please see the Successes section of the UMDI Year 1 SSA Evaluation Report for greater detail (p. 13).

disadvantaged students. Berkshire CC is looking to the SSA program as a model for wider campus implementation as part of its strategic planning process.

Student engagement. Most site reports noted student engagement with SSA programs as a success, especially student enthusiasm for and appreciation of the opportunities provided through SSA. Half of the sites included student quotes, stories, and testimonials about the impact of SSA on their lives.[4]

Examples: North Shore CC included a quote from a Math Boot Camp student who said, "When I started this course I couldn't properly perform division, and algebraic equations were like a foreign language to me. I am amazed at how quickly I have learned to perform these equations, which don't seem quite so scary anymore." A Greenfield CC student said, "I didn't know what I didn't know until I took Math 095 …. It really empowered me and helped me realize that math and science are achievable career paths. I had written off science and math as something I couldn't do. Now, I can consider math and science fields as a major or a career, and I realize that they're attainable."

Challenges

Sites were quite focused when reporting about challenges. The most commonly cited Year 1 challenges in the site reports were related to timing and recruitment, which were each listed by two-thirds of SSA sites. These challenges themselves were related, as most sites said timing was one of the primary challenges to recruitment. Staff and administrators were faced with a very rapid program start-up, and students were faced with short timelines for testing and decision making. These challenges were summarized succinctly by one site representative who wrote, "The challenges that faced staff and students alike could all be traced back to navigating unfamiliar waters in a short amount of time." Other timing-related challenges mentioned by sites included establishing infrastructure and systems; finding, hiring, and training staff; developing data tracking systems; and establishing stipend dispersal mechanisms. Most sites noted that these were start-up challenges that were not anticipated in Year 2.

Aside from timing and recruitment, sites raised several other challenges, but none were mentioned by more than a third of the sites. One challenge mentioned by a few sites related to programmatic rigor and students' lack of preparation. These sites described the difficulties posed by the mismatch between student aspirations in STEM fields and their lack of academic preparedness. For example, one site representative wrote, "Most of our student population is not prepared to step directly into credit-bearing STEM courses though they may have a sincere interest in the field." Another framed the issue as a discrepancy between "student expectations" and "the reality of a rigorous academic program."

A handful of other challenges were mentioned, each by one or two sites. These included limited staffing, navigating many external partners, and student transportation challenges.

Benefits

Sites were asked to describe the most significant benefits to their institutions as a result of SSA to date. Many of the benefits reported by sites reflected the successes reported above and in the UMDI Evaluation Report. The major themes are captured here.

Development and implementation of activities to engage, motivate, and retain students. About half of site representatives listed SSA transition programs, awareness activities, college-level

[4] Please see Appendix L3, which presents these materials in their entirety.

coursework, scholarships, and research experiences as benefits to their colleges. They also commented on the positive experiences of faculty and students involved with SSA programs.

Internal and external collaboration. The increased ability to coordinate and leverage resources both within a campus and between campuses and other institutions was cited as a key benefit of SSA by two-thirds of SSA sites. As mentioned in the UMDI Evaluation Report, internal collaboration was a strong theme across campuses.

Development of sustainable infrastructure to support STEM programming, coursework, and pathways. Half of the sites noted these types of activities as a key benefit of SSA. Infrastructure improvements included classroom computer software and hardware updates, laboratory equipment improvements, new mathematics labs, additional tutoring and study space, and other technology resources such as STEM orientation videos or advising and career exploration software.

Increased capacity to reduce barriers and provide support. About a third of SSA representatives reported that their sites benefitted from SSA-supported capacity increases in areas including financial assistance to students, career counseling, tutoring, advising, self-paced course availability, research experience opportunities for students, STEM-specific student orientations, and hands-on STEM experiences.

Additional recruitment tool for community colleges. A few sites mentioned that SSA programs served as a recruitment tool for students who might not otherwise have come to their local community college, but "who find a good fit once here."

Promising student outcomes. About half of the sites identified preliminary indicators of student progress as benefits to their institutions. A few noted high student satisfaction with SSA programs (which may lead to better retention). A couple described increased student awareness of STEM programs. Several sites reported course performance data or preliminary GPA data suggesting the benefit of SSA programs to students.

Cross-Cutting Considerations

A few cross-cutting themes emerged from sites' reflections on their first year SSA implementations. These themes might contribute to cross-site dialogues regarding promising practices and core elements of SSA implementation. Many of these considerations were captured in the UMDI Evaluation Report, including reflections on recruitment strategies, program length and intensity, stipends and incentives, peer mentoring, sustainability, and working groups.[5] Some additional reflections that emerged from the site reports are highlighted here.

Recruitment

Across campuses, recruitment of SSA participants emerged as a topic for more in-depth consideration. Sites considered recruitment a source of successes, challenges, and lessons learned, and a focus of renewed efforts for Year 2. This subsection captures sites' reflections on the lessons learned about recruitment from Year 1. Sites' planned adjustments for Year 2 recruitment are captured in the Year 2 Plans section of this report that begins on page 22.

[5]Please see the Future Considerations and Lessons Learned sections of the UMDI Year 1 SSA Evaluation Report for greater detail (pp. 15 and 63, respectively).

Importance of relationships with high school faculty and staff. About a third of the sites reported that the success of their recruitment efforts varied based on the interest of individuals at high schools. Some SSA coordinators reported that principals and administrators sometimes remained unaware of SSA even after the coordinators had met with high school staff at that school. Site representatives described the need to "work closely" with high school partners to spread information about SSA to teachers, guidance counselors, and administrators and to identify potential students. Some found that direct contact with high school students (e.g., through visits to high school classrooms or onsite presentations) was the most successful recruitment tactic. One site had success providing a stipend to a staff member at each local high school to act as a point of contact for SSA (Berkshire).

Value of on-campus collaboration. One third of the sites commented on the importance of collaboration with other campus offices to facilitate successful recruiting. A few sites noted that collaborative relationships on campus (e.g., with first year programs or admissions offices) helped spread the word about SSA to a wider audience and recruit more students. Similarly, a few sites found that *lack* of coordination with other campus offices often led to overlapping recruitment efforts with other campus initiatives in a way that reduced attention to both programs. A representative at one site reported having too little communication with a partner department that was charged with recruiting for an SSA program, which resulted in low program participation. Administrators at that site decided to be more "hands on" with future recruiting efforts.

Benefits of intrusive engagement with potential recruits. A few sites reported learning about the need for sustained contact with potentially interested students. One site representative commented that students whose interests were piqued by mailings or events needed a contact person at the college who could help sustain their interest until program activities began. Another site reported learning that SSA representatives needed to be more intrusive in terms of making new and potential students aware of SSA rather than "letting students come to [them] with their interest." A third site found that the community college needed to "take the lead in recruiting and preparing students for SSA, rather than relying on partner institutions to assist." That site found that parents and potential applicants working with a partner "feeder" institution were missing deadlines and getting mixed messages. Each of these sites planned more "intrusive" engagement strategies to make sure that representatives have more direct or sustained contact with potential students.

Placement testing was stressful for applicants. Two sites reported that taking and retaking the Accuplacer exam was distracting or demoralizing to students. One site representative said the testing process "became a negative distraction for many potential applicants." Another said it "subjected the students to unneeded frustration and performance anxiety." One site found that instructor evaluations of students in a mathematics review workshop were more accurate than the exam in placing students in mathematics courses. The other site was experimenting with a rearranged program schedule for Year 2 that de-emphasized the pressure around testing.

Promising Engagement Strategies

A few sites briefly highlighted strategies that they found were particularly effective at engaging students with STEM content. These strategies included having low student-to-instructor ratios, offering opportunities for students to participate in research, enrolling students in the "right" next mathematics course in their progression, providing hands-on or experiential activities, and creating simulations to teach STEM concepts. In most cases, site representatives reported that these strategies were effective or successful (e.g., "Actual hands-on workshops and activities are successful with students and makes them aware of the possibilities of STEM programs and careers") but offered little further discussion. This might be a fruitful avenue for continued dialogue.

Stipends and Incentives

Most sites discussed stipends in their reports. Echoing a theme highlighted in the UMDI Evaluation Report, SSA sites had mixed sentiments about stipends, incentives, and other financial assistance to students.[6] About half of the sites felt that stipends to students were an effective incentive to participate. These included in-kind incentives, such as textbook assistance and lunch stipends. One site indicated that stipends were a primary reason students applied for their program and two other sites reported that participation in SSA might have been a significant challenge for students without a stipend. A couple sites provided stipends to facilitate students' engagement in research experiences and felt that these "allowed students the financial freedom to participate." Conversely, a couple sites felt that stipends were either "not a significant motivator" or "did not seem to be a deciding factor." Finally, two sites that planned to significantly reduce or eliminate their stipends expressed concern over the number or quality of participants they would be able to recruit in Year 2 without a stipend.

Coursework

Several sites' experiences in Year 1 led them to reconsider the type of credit and non-credit coursework they offer as part of SSA. A few site representatives felt they had included too much content either into a single course (e.g., a college success course) or into the series of courses offered in a summer bridge (e.g., too many developmental subjects or too many college-credit courses). Other sites wanted to offer a greater variety of course topics to SSA students. A couple sites decided to switch from a single-subject STEM course (e.g., engineering) to a survey course covering a range of STEM disciplines. Sites that ran summer programs with a rigorous single-subject mathematics focus generally reported that this rigorous focus was effective at accelerating students' progress. Finally, a few sites reported not offering full-credit course options for summer SSA students out of concern that poor performance would damage students' GPAs as they enter college.

Assessment

Campuses reported a variety of techniques to evaluate their SSA programs and activities. Most sites used some sort of survey strategy to evaluate students' experiences and knowledge, and/or campus data systems to track student outcomes. Less common strategies included communication between SSA coordinators and course instructors to track student progress, formal or informal interviews and focus groups with participants, and tracking attendance through event registration. The most common measures to be tracked included college matriculation or retention for SSA participants, course performance and completion, and participants' majors or academic programs. Some campuses were focusing more on formative evaluation (providing feedback to program administrators for the purpose of program improvement), and some campuses were focusing more on summative evaluation (tracking student outcomes to assess program impact).

Spring Activity Detail

The data presented in this section were drawn from the Spring Activity Detail section of the Annual Site Report. There, SSA administrators and staff were asked to reflect on their institution's spring 2014 activities, specifically key activities and goals, assessment strategies, lessons learned, student successes and contributors to success, contributors to challenges, technical assistance needs from DHE, and participation numbers. Some reflections emerged as broader considerations for SSA across sites (e.g., challenges), and not specifically limited to the spring time period. These have been captured in the cross-cutting themes section, above.

[6] In the Future Considerations and Next Steps section (p. 16).

In the spring, most sites were engaged with start-up activities and were working intensively with recruitment, but many were not yet providing direct service to SSA students.[7] Consequently, this section typically had less content in the site reports than did the Summer Activity Detail section. In what follows, this section summarizes SSA key activities, goals, student successes, and participation specific to spring 2014.

Key Activities

Key SSA activities in spring 2014 included recruitment efforts (e.g., high school outreach, outreach to admitted students, advertisements, and recruitment events) and program start-up activities (e.g., hiring staff, developing curriculum, expanding student support services, planning summer programs, building industry relationships, developing assessment plans, and building infrastructure). Sites hired peer mentors and tutors or expanded career counselor and tutoring center hours. Six sites developed or revised courses that would be taught over the summer.

In addition to recruitment and start up activities, more than half of the sites hosted STEM career exploration events, often with hands-on activities facilitated by community college faculty. In many cases, these events were designed to introduce students to the community college and doubled as recruiting events. A variety of activities were reported, including a "crime scene investigation simulation," STEM workshops or afterschool programs for high school students, a STEM career fair for current students, STEM majors fairs, STEM-themed speakers, and open houses with hands-on STEM activities.

A few sites also supported professional development or curriculum alignment activities in the spring. At least one site carried out each of the following activities: piloted and trained faculty on an "intrusive advising" software; sent faculty, staff, and students to professional conferences; hosted curriculum alignment events with community college and high school faculty. A couple sites initiated SSA programing. One site established a textbook lending library, another began offering dual enrollment developmental mathematics "learning communities," and another still used SSA funds to support a technology-based internship program for current students.

Goals

The goals reported by sites for spring SSA activities were focused on three broad categories: recruitment into the community college and into SSA in particular, increasing students' STEM program and career awareness, and increasing student readiness for STEM programs through student support services and professional development for STEM faculty and staff.

Student Successes

Sites were asked to report student successes from the spring that were formally measured or informally observed. About half of the sites reported student engagement successes, including increased use of support services, high levels of expressed interest and enrollment in summer SSA programs, and positive responses from students. One site reported that students from their spring SSA programs had matriculated into STEM degree programs. Another site reported increased interaction with regional industry partners, high school teachers, and high school principals as a result of SSA outreach. One site reported on the

[7] The UMDI Evaluation Report contains a detailed analysis of spring 2014 SSA activities, based on survey and interview data, including a site-by-site overview (pp. 18–33).

success of their symposiums between high school and community college faculty in creating dialogue around mathematics curriculum and placement.

Facilitators of Success

Echoing a repeated theme, most sites reported that student successes were facilitated by internal and external collaborations. Examples of collaboration between members of the campus community included coordination between SSA administrators and admissions offices, the dedication and commitment of staff and faculty, and engagement and support from administration. Examples of external relationship building included relationships between the college and high school faculty, recruitment sites such as Adult Basic Education sites, local businesses, and four-year colleges. A few sites also mentioned other contributors to their students' successes, including access to a "point-person" to help students stay connected and engaged, good tracking and assessment systems, and building direct connections with potential students as a recruitment strategy.

Participation

Sites were asked to report the number of primary and secondary participants served in spring 2014 SSA activities. In a few cases, these numbers do not match with the supplemental student request data, and insufficient detail was available in the site reports to determine the source of these discrepancies.

Table 1: SSA Primary and Secondary Participants Reported in Year 1 Site Reports, Spring 2014

	Number of SSA **primary** participants served in spring 2014 SSA activities	Number of SSA **secondary** participants served in spring 2014 SSA activities
Berkshire	0	84
Bristol	12	392
Bunker Hill	0	0
Cape Cod	0	299
Greenfield	0	115
Holyoke	0	770
Massasoit	0	850
MassBay	0	28
Middlesex	275	177
Mount Wachusett	236	449
North Shore	0	250
Northern Essex	209	6
Quinsigamond	82	845
Roxbury	43	200
Springfield Technical	0	530
Total	**857**	**4,995**

Summer Activity Detail

This section's findings were drawn from the Summer Activity Detail section of the site reports. Site administrators and staff were asked to reflect on their institution's summer 2014 SSA activities, specifically key activities and goals, assessment strategies, lessons learned, student successes and contributors to success, contributors to challenges, technical assistance needs from DHE, and participation numbers. As with the Spring Activity Detail, some reflections emerged as broader considerations for SSA across sites and not specifically limited to the summer time period. These have been captured in the Cross-Cutting Themes section above. In what follows, this section summarizes SSA key activities, goals, student successes, and participation specific to summer 2014. This section is more extensive than the Spring Activity Detail because most sites began their intensive SSA student service activities in the summer.

Key Activities

Key activities during summer 2014 at SSA sites were quite varied.[8] The details of this variation may prove useful to SSA representatives as they plan for future SSA iterations. Thus, rather than summarizing across sites, this section presents information about each site's programming individually, based on what sites reported as their key activities over the summer. Where possible, common elements are included in the following descriptions in order to maximize efficiency for the reader; however these elements were not always available as sites presented varying amounts and types of information in their reports.

Berkshire

Summer success program. Twenty-one entering college students participated in this program, which consisted of three weeks with three different focus areas. Each week was four days long, with each day varying in length. All activities were provided for free and stipends were offered for Weeks 2 and 3. Nineteen (90%) of the 21summer participants were still attending Berkshire CC and participating in SSA at the time of the report.

Week One: Content Workshops – Academic remediation in mathematics, reading, and writing were provided for those students deemed not college ready. Each day of the program consisted of three hours of mathematics followed by three hours of either writing or reading.

Week Two: BCC STEM 101 – This was a twenty-four-hour class spanning all four days of the week and awarding one college credit. All SSA students were required to attend this class.

Week Three: STEM Explore – This week was optional for students, and they could attend as little as one or as many as all four days of the program. Each day had a different STEM topic and the class was instructed by college faculty.

Bristol

Summer bridge program and summer learning communities. Forty-six students participated in *either* summer bridge or summer learning communities , where participants took two to three college courses during the 11-week summer session. Both programs were offered for free, but students in the summer bridge program were required to purchase their own textbook. Forty one (89%) of the students who participated in these programs matriculated into Bristol CC in the fall, 29 into a STEM or Mass Transfer program.

[8] Please see the UMDI Evaluation Report section on summer 2014 activities, which presents detailed site-by-site information gathered from surveys, site visits, and interviews (pp. 34–60).

Summer bridge program. Incoming freshman students with interest in a STEM field could take three college courses and have access to STEM career activities and a STEM advisor. Students chose one mathematics course (modularized developmental mathematics or college algebra) and one science course (developmental chemistry or biology for majors), and all students were required to take the STEM College Success Seminar course. The program included a weekly STEM career activity (guest speakers, STEM faculty activities, and field trips) designed to increase and enhance students' awareness about various programs and careers in the STEM fields. The program ran Mondays through Thursdays, from 8 a.m. to 12:30 p.m.

*Summer **l**earning **c**ommunities*. Learning communities consisted of two classes, the one-credit STEM College Success Seminar course and the three-credit computer-aided integrated developmental mathematics course. Learning communities were held two afternoons per week and were offered at all three BCC campuses.

Summer financial support. In addition to the summer bridge and learning communities courses, the BCC STEM Starter Academy provided summer financial support to 30 current STEM students to cover summer classes. The support helped cover breaks in financial aid that would have slowed students down in completing their degrees.

Bunker Hill

Mathematics clusters. Sixty current community college students participated in four accelerated and STEM-contextualized mathematics clusters (2 MAT 097/099 and 2 MAT 099/194) over the summer. These clusters ran for eight weeks, for three hours a day. There was no cost to students and stipends were offered upon completion. Courses were taught by experienced mathematics faculty, who had collaborated with science faculty to contextualize the curricula for biology and engineering. A student tutor and student mentor were embedded in each of the four sections. Students also had access to a "LifeMap Navigator" advisor, who provided career, study skills, and course advising assistance to students from all four clusters. Fifty nine (98%) of the students passed their course.

STEM workshops. Forty students from the summer mathematics clusters participated in two workshops that were the second part of the STEM Starter Academy. Workshops were offered in biology or engineering and lasted three days in August. The workshops were offered for free. They were designed to expose students to careers in STEM fields, introduce them to science faculty, allow them to learn basic lab skills, and help them solidify their relationships with the small cohort of their peers with whom they had taken the clusters over the summer. Each workshop was co-taught by two faculty from the respective departments. The workshops were non-credit and non-graded and open only to STEM Starter Academy participants.

Cape Cod

Summer bridge program. Six students participated in the program, which offered students the opportunity to take the next mathematics course (according to their ability) for free before the fall semester began. A stipend was offered as an incentive. Students either took a course that was being offered at the college or a developmental course through Educate Online. Those who did not place into college-level mathematics took an accelerated mathematics refresher program with the goal of being ready for a college level mathematics course in fall 2014. Students were also offered tutoring and ongoing advising support as they continued in STEM. All six students who completed a summer bridge course enrolled in STEM courses for the fall semester.

Outreach. Presentations for high school teachers and administration at Cape Cod Community College focused on STEM Starter funding and opportunities, STEM careers, and STEM pathways and courses available at Cape Cod CC. A staff member was hired to coordinate the programs and services related to SSA. The coordinator continued and broadened outreach efforts and worked to build internal and external communication at the end of summer 2014 and into fall 2014.

Greenfield

Summer bridge program. Eighteen students participated in the program, which covered the full cost of tuition and fees for a three- to four-credit summer-session STEM course. The program included intensive advising, access to faculty tutors in Greenfield CC's Mathematics and Science Studios, college success skills workshops, opportunities for peer support, Accuplacer testing, a college orientation session, in-depth career exploration workshops, and personal career coaching. Additional faculty summer hours in the Mathematics Studio were supported by SSA. One-hundred percent of participants completed the course, 80% with a B or better. Seventy-two percent of participants either enrolled at Greenfield CC in the fall or applied for early entrant status for SP15.

Holyoke

Summer bridge program. Forty-six students participated in this five-week summer program, where they could choose one of three STEM credit courses. Classes met four days per week, from 8 a.m. till noon. Students participated in college success and career exploration workshops in the afternoon one day per week (accompanied by a free lunch) and also attended one STEM-themed field trip. Participants included incoming community college students as well as dual-enrolled high school students. Course tuition/fees and books were free, and students who received a passing grade and met attendance requirements were given a $250 stipend. Students were supported by a dedicated career counselor, peer mentors, and professional tutors. Ninety-six percent of participants completed and passed the course.

Adult Pre-STEM program. Twenty-three students participated in this six-week, adult-learner, "pre-STEM" Transition to College and Careers program. The program used a collaboratively designed and taught developmental mathematics, reading, and writing curriculum contextualized for health and sustainability careers. It was offered both during the day and evening (15 day students, 8 evening). The program included academic program exploration, career exploration activities and advising, and college success skills, all taught using collaborative, experiential, project-based learning techniques. Most of the participants were enrolled in Adult Basic Education programs, working toward passing their HiSET (high school equivalency test) or improving their English. Ninety-one percent completed the program, and 87% continued their educational pathway in the fall (enrolled in college, enrolled in Transition to College and Careers program, or returned to their home Adult Basic Education program).

Massasoit

Summer bridge program. Forty-two students (primarily recent high school graduates) participated in this intensive five-week program focused around self-paced mathematics. Two faculty led each mathematics section, accompanied by four tutors. Courses and materials were free. The program involved self-paced mathematics for two hours in the morning (Fundamentals, Introductory Algebra, Intermediate Algebra, and College Algebra); STEM awareness or research activities during the midday period; and open computer lab time for more mathematics work each afternoon. Additional elements included periodic field trips and invited speakers to explore STEM career possibilities, intensive academic advising and mentoring, STEM academic study and success skills, experiential learning activities (e.g., conducting research), and guided career and academic program exploration (e.g., mapping academic and career plans). Ninety percent of participants completed their developmental mathematics course or

college-level mathematics course. Forty percent of students completed two-or-more mathematics courses. Forty participants (95%) enrolled at Massasoit for the fall semester.

Math boot camp. This program was offered to students who wanted to improve their mathematics skills for better placement scores on the Accuplacer exam.

MassBay

High school summer bridge program. Thirty-eight high school students participated in this two-week program where they could choose either four two-and-a-half-day hands-on workshops or a free college-credit course. Each option cost $100. Twenty-one students participated in the workshops, which included "Artbotics" (combining art with computer programming) and "App Inventor" (programming for smart phones). Seventeen high school seniors and juniors chose to enroll in the college-credit courses, either CS 106 – Cyber Security Awareness (two credits) or MN 130 – Engineering Design (four credits). All 17 of these students successfully completed their courses and received college credit.

SSA classes. One hundred current MassBay students enrolled in eight summer-term gateway STEM courses that had been identified as "SSA Classes." Of those who persisted and returned to MassBay in the fall, 45 were offered tuition benefits.

Summer workshops. MassBay offered two new workshops (Introduction to Life Sciences and Introduction to Biotechnology) during summer 2014 for high school students and for existing MassBay students.

STEM seminar series and Friday Forums. Faculty and SSA staff invited industry leaders to speak with students to create awareness about well-paying STEM careers.

Middlesex

Summer bridge program. Thirty-five students (recent high school graduates, current undeclared Middlesex students, and new Middlesex STEM students) participated in two sessions of a two-week long summer bridge program designed to provide an opportunity for students to explore their interests in STEM fields. Faculty introduced various STEM academic programs (e.g., clinical laboratory science, biotechnology, computer science) through hands-on laboratory experiences. The sessions encouraged students to see STEM fields as realistic fields of study by providing participants with practical and interactive experiences. Students were introduced to academic content as well as to faculty, staff, and other support systems on campus. Peer achievement mentors were matched with summer bridge participants in mentoring relationships that continued beyond the summer.

Research Experiences for Undergraduates. Seven current Middlesex STEM students engaged in high-level research experiences at UMass Lowell and Northeastern University and were provided stipends to facilitate their participation. Students developed skills related to their studies and improved their post-graduation marketability to employers. This program also provides Middlesex CC the opportunity to foster relationships with companies or employers through which the college can stay up to date with the needs of industry and better prepare and support students.

Math Boot Camp. This program was designed to bridge the gap between the mathematics preparedness of students interested in pursuing STEM programs and the requirements of those programs, primarily by helping students boost their scores on the College Placement Test. Math Boot Camp participants improved their scores on the College Placement Test by an average of 29 points and eliminated more than 50% of remedial classes.

UMass Lowell Research workshops. Current Middlesex CC students participated in multi-day, hands-on laboratory-based STEM workshops led by UMass Lowell faculty on the UMass Lowell campus. Students were exposed to a four-year institution while developing practical laboratory skills and knowledge in various STEM/health disciplines, such as biotechnology and medical microbiology. The workshops were designed to help students discover pathways beyond the associate degree or a certificate.

Mount Wachusett

Summer academy. Twenty-three students participated in this intensive, seven-week academic program that ran July 7–August 21, Monday–Friday, 9 a.m.–3 p.m. Courses and materials were free and students were given a stipend. Students enrolled in two college-level classes, participated in community service, and received tutoring and advising support. The first week was an orientation that allowed students to get their textbooks, meet their professors and tutors, activate their college accounts, explore STEM careers in the community, and participate in community service. In weeks two through seven, students attended a college course in the morning (9 a.m.–noon) followed by a mandatory study period in the afternoon (1–3 p.m.). Twenty-two (96%) of the summer academy participants returned for the fall semester.

College coursework. One hundred fourteen students were supported in one SSA-funded college-level course over the summer.

North Shore

Introduction to Engineering. Thirty-one high school students from the local area participated in a two-credit course required for the Engineering Science Transfer and Pre-Engineering programs during July 2014. They worked on the standard engineering curriculum, participated in group projects, and took field trips to area engineering firms. The program gave students an opportunity to earn college credit and also provided wide exposure to a variety of engineering fields and occupations. Eighty-seven percent of participants passed the course with a C+ or better.

STEM career days. More than 50 area high school students as well as eight local STEM professionals from a variety of disciplines were hosted at either the Lynn or Danvers campus. Students attended presentations and demonstrations by STEM professionals, including a molecular biologist, an astrophysicist from NASA, a computer scientist (video game designer), a robotics engineer from iRobot, and a food microbiologist from Gorton's Seafood.

Math boot camp. Twenty-seven students participated in this four-week program that ran August 4–28. Students met in the mathematics lab Monday through Thursday with three instructors and a STEM peer mentor. The course and materials were free, and lunch stipends were provided. At the end of the summer session, 26% were able to go directly into college-level mathematics and the remaining students had the opportunity to finish their remediation requirements in the fall.

STEM-focused orientations. Students met individually with the SSA coordinator, STEM peer mentors, and both the dean and assistant dean of STEM. They were advised on the courses they should take and the steps that would help them be successful. Advisors discussed career opportunities, the pros and cons of working while going to school, and the details of mathematics placement with each student. The participants left with their schedule, a plan to get to graduation, and the names and contact information of several resource people to help them get through any struggles that might arise.

Northern Essex

Summer bridge program. This five-week program focused on lab sciences and incorporated reading and writing skills. Students also participated in hands-on activities in labs with the lab science faculty and received mathematics support for future lab science courses.

Lending library. The college created a lending library to boost student retention and persistence to graduation by reducing out-of-pocket costs for textbooks and student debt. Currently the library has over 300 titles and 1,000 items. Of the 56 students who used the lending library in the spring 2014 semester, three graduated and 38 registered for fall 2014. This fall the college will increase the services of the lending library to further assist students with textbooks and other items such as calculators for mathematics courses.

Quinsigamond

Summer bridge. Quinsigamond CC held three separate classes as part of its summer bridge program. The first two listed below were paired with a one-credit college success seminar.

Introduction to Biotechnology. A three-credit course introducing the basic tenets of biotechnology including the scientific method. Students discussed the ethics, public policy issues, patent issues, career opportunities, and therapeutic promises of recombinant DNA technology. Students participated in a virtual drug discovery program, which covered issues in drug discovery such as target identification, lead discovery and optimization, candidate selection, ethical clinical trials, and drug markets.

Introduction to Computer Systems Engineering. A four-credit course introducing students to Microsoft client on desktop operating systems. Topics included operating system installation and configuration, file systems, resource management, user management, and security. This course was designed to prepare student to sit for the Microsoft Certified Professional certification examination.

How to Build Your Own Guitar. This non-credit course involved hands-on building and introductions to manufacturing technology, CAD drawing, and art and music theory. Students ended the course with their own fully functional electric guitars.

The Technology Academy, Engineering Challenge, and Girls Robotics programs. These programs focused on current high school and middle school students. They were designed to expose students to computer-related careers, robotics, and engineering problems.

The Students Transitioning to College program. This program was designed to provide incoming Quinsigamond CC students with college success skills and introduce them to the CC's student services and college programs. Each student was given an automation device (laptop, tablet, etc.) and instruction in college-success-related computer skills. Participants also explored STEM careers.

Roxbury

Summer STEM academy. The five-week Summer STEM Academy was offered to Madison Park Vocational Technical High School students as part of the RoxMAPP initiative. It included hands-on experiences, simulations, and field trips.

Career Focus publication. This print and electronic magazine was designed to enhance awareness of STEM disciplines and careers. The Winter/Spring 2014–2015 issue highlighted careers in allied health, biotechnology, and radiologic technology and was distributed to approximately 80,000

households in the Roxbury, Dorchester, and Mattapan zip codes. The publication also includes information for families on how to prepare for college, financial aid, and jobs in the Boston area.

Springfield Technical

Summer bridge program. Thirty recent high school graduates participated in this intensive seven-week program that ran July 7–August 22, five days per week, 8 a.m.–4 p.m. Courses, textbooks, and supplies were free and students could earn a stipend up to $1000 (based on a point system) for completing the program. Students took three classes (Algebra I, II, or "tech math"; an engineering technologies course; and a college success seminar) for four days and engaged in STEM-career related activities (such as a summer speaker series and field trips) on Fridays. Mandatory study halls were structured into students' days, with tutors leading one-on-one and group work. Peer tutors advised students on campus life. Students had mandatory meetings and drop-in appointments with a STEM coach to discuss current academic progress and any barriers to that progress. Students who had two or more developmental placements were assigned a professional advisor who, using an intrusive advising model, sent frequent reminders and followed up with the students. Thirty (91%) of the entering 33 students completed the summer bridge program.

Summer Program Goals

Site's goals for their summer programs largely reflected the four general objectives for SSA, as outlined in the joint proposal submitted to DHE by the community colleges.[9] Some of the specific goals reported by sites within each of these larger categories are captured here.

1. **Increased student awareness of and access to STEM programs of study and career opportunities.** Specific goals that were mentioned included providing opportunities to take college courses; creating access to STEM field trips and guest speakers; exposing students to careers in computers, robotics, and engineering; providing resources to connect academic programs to career pathways; providing access to STEM advising; and generating excitement about STEM fields among incoming and current students.
2. **Enhanced student readiness for and recruiting into STEM pathway programs.** Specific goals in site reports included providing opportunities to finish developmental mathematics or take classes that count toward their major, ensuring proper placement of students in college courses, increasing student success in mathematics, teaching basic lab skills, providing hands-on practical experiences to prepare students for rigorous college-level STEM classes, and aligning high school and community college curricula.
3. **Improved student retention based on academic success and overcoming "life barriers."** Sites' specific goals included reducing financial barriers to entry, persistence, and completion; introducing students to science faculty; helping students build relationships with a cohort of peers; improving STEM curriculum; providing increased academic support; introducing students to their college's support services and programs; and supporting faculty in their roles and in preparing for future curriculum development.
4. **Increase completion through pathways to STEM jobs, transfer to higher-level STEM academic programs, and the award of certificates or degrees.** Specifically named goals included developing and clarifying STEM pathways, accelerating students' academic progress in

[9] This proposal is available on the DHE STEM Nexus web site: http://www.mass.edu/stem/documents/STEM%20Starter%20Academy/SSA_CC_Proposal.pdf.

STEM fields of study, and aligning community college and post-secondary curriculum through faculty partnerships.

Student Successes

Three major themes emerged in sites' reporting on "student successes measured or observed" for summer 2014. Most sites reported positive feedback from student participants about their summer SSA programming and high rates of completion among those students. A few details are summarized below. Many sites also tracked and reported preliminary indicators of student success in terms of achievement and retention into the fall. Sites were also asked what factors contributed to these successes. In response, site representatives credited within-campus and external collaboration and engagement; structured support for students; student connections to their peers and to faculty and staff; and teaching strategies that included engaged, hands-on pedagogy and contextualized curricula.

Positive student reception of and feedback about SSA programs. Many sites reported on student feedback from surveys or focus groups indicating students' satisfaction with SSA programs. Reported student feedback included perceptions of skills gains and goal accomplishment, appreciation of the opportunity to become familiar with campus and meet faculty, increased enthusiasm for and confidence in mathematics, growing interest in similar programs and opportunities, increased awareness of STEM programs and career opportunities, agreement that SSA programs were valuable academic opportunities, reinforced desire to pursue STEM fields, valuing of hands-on experiences, improved knowledge of campus support services, greater sense of belonging to campus community, and increased confidence in pursuing and selecting a STEM major.

Student progress and achievement during summer programming. Most sites had high completion rates among summer SSA program participants. Students completed academic coursework, maintained relatively high GPAs, and progressed in the developmental mathematics sequence.

Student retention beyond summer. About half of the sites reported continued participation by summer SSA students during the fall semester. Many SSA students enrolled at the community college for the fall semester. Some continued to participate in SSA-sponsored required or voluntary activities.

Participation

Sites were asked to report the number of primary and secondary participants served in summer 2014 SSA activities. In a few cases, these numbers do not match with the supplemental student request data, and insufficient detail was available in the site reports to determine the source of these discrepancies.

Table 2: SSA Primary and Secondary Participants Reported in Year 1 Site Reports, Summer 2014

	Number of SSA **primary** participants served in summer 2014 SSA activities	Number of SSA **secondary** participants served in summer 2014 SSA activities
Berkshire	21	144
Bristol	10	219
Bunker Hill	60	0
Cape Cod	6	405
Greenfield	18	235
Holyoke	72	20
Massasoit	57	110
MassBay	235	38
Middlesex	233	7
Mount Wachusett	137	0
North Shore	56	1220
Northern Essex	16	3
Quinsigamond	37	197
Roxbury	9	80,000
Springfield Technical	33	0
Total	**1,000**	**82,598**

Sustainability

Sites were asked to reflect on the sustainability of their SSA programming to date. Specifically the reporting template included three sub-topics: a description of each institution's efforts to make SSA programs and activities sustainable beyond the period of grant funding, reflections on the most valuable and most sustainable aspects of Year 1 programming, and discussion of the overlap between SSA activities and other initiatives or programs at each site. Responses to each of those topics are summarized here.

Sustainability Efforts

Sustainability was an initial goal of SSA, and the FY15 9c budget cuts drew sites' attention to this issue more acutely. As they reported on sustainability, SSA site administrators expressed concern about the prospects for maintaining some of what they considered to be critical elements of SSA, including the staff

who provide intensive support services and coordination. A few other themes emerged from sites' reporting on their sustainability efforts and they are summarized here.

Infrastructure improvements. About a third of the sites used SSA funding to make investments in sustainable infrastructure, including computer and science lab upgrades, advising software implementation, and new technology purchases. One site installed a solar panel array that will be used for teaching and research. Another site outfitted a research lab where students can work as interns.

Development of collaborative relationships. Representatives at about half of SSA sites felt that the collaborative relationships they had developed both on and off campus through SSA would carry forward and continue to benefit the college generally and STEM programs specifically.

Development of models. About half of site representatives cited programmatic innovations funded by SSA as elements of sustainability; models were developed that could be used and modified in the future. Sites developed new curricula and courses; piloted new internship, career, and research programs; redesigned course sequences; established new student clubs; developed new advising tools and resources; and created new interdisciplinary committees.

Leveraging SSA to seek other funding. About a third of the sites were using models developed with SSA funding to seek external support, including through community agencies and by applying for other grants (e.g., NSF-S-STEM). Site administrators also felt that the demonstrated success of SSA programming could be used to seek institutional support for SSA activities; a few sites had already secured institutional commitments for elements of their SSA programs.

Programmatic decisions for sustainability. A few sites commented that their SSA program designs were based around an awareness of sustainability issues. Some developed programmatic models that were free to students, but that could become tuition based if needed. One site limited the student stipend to an amount that might be more affordable to the institution in the long run.

Program Elements Most Worth Sustaining and Most Likely to be Sustained

Considering both resources and limitations, sites were asked which elements of their SSA programs were "most worth" sustaining and which were "most likely" to be sustained. Although there was not consensus across sites in either of these categories, a few elements were more commonly named than others.

Most Worth Sustaining (top five)	Most Likely to be Sustained (top five)
▪ Summer bridge / STEM academy	▪ Summer bridge / STEM academy
▪ Mathematics remediation/readiness program	▪ Tutoring support
▪ Tutoring support	▪ Mathematics remediation
▪ Peer mentors	▪ Peer mentors
▪ SSA/STEM staff (advisors and coordinator)	▪ Research experiences / internship programs

Each of the following elements were cited as "most worth" sustaining by at least one site: curriculum development and instructional strategies (e.g., contextualization), advising (including software), college success programs, research experiences, career exploration events and counseling, mandatory program requirements, STEM clubs, program alignment efforts, GPS STEM pathways, incentives and stipends (including food), field trips, professional development for faculty and staff, industry partnerships, an

industry mentor program, school-year scholars programs, STEM exploration workshops at high schools and four-year schools, a lending library, and infrastructure improvements. A couple sites indicated that all of their SSA activities were "most worth" sustaining.

Each of the following elements were named "most likely" to be sustained by at least one site: STEM experiences outside the classroom (e.g., field trips and speakers), STEM student spaces, regular cohort meetings, STEM staff, college success components, career counseling, STEM clubs, STEM competitions (e.g., robotics), professional development, classroom software and technology, contextualized curricula, instructional strategies, program alignment efforts, STEM hands-on workshops at four-year schools, career exploration events, a textbook lending library, and a career outreach publication. One site reported that they could not "make a firm prediction" about what elements would be likely to be sustained.

Synergy with Other Initiatives and Programs

With a view to sustainability, sites were asked if any SSA activities had been embedded in or informed by other initiatives or programs at their colleges. Site representatives named a range of initiatives at their institutions that aligned with SSA programs and activities. These included grant-funded initiatives as well as campus-based programs and services.

Grant-funded initiatives included those from:	Campus initiatives and collaborations included those with:
▪ Vision Performance Incentive Fund, ▪ Complete College America Guided Pathways to Success, ▪ National Science Foundation (ATE, STEP UP, S-STEM, LSAMP), ▪ ABLE4STEM, ▪ Federal Title III grants, ▪ TAACCCT III and IV, ▪ @Scale, ▪ TRiO, ▪ Private foundations (e.g., Balfour Foundation), ▪ Achieving the Dream, ▪ Boston Area Advanced Technological Education Center (BATEC), ▪ Commonwealth Alliance for Information Technology Education (CAITE), ▪ Massachusetts Advanced Manufacturing Program (AMP it up), and ▪ Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP).	▪ Career Vocational and Technical Education (CVTE); ▪ admissions offices; ▪ career advising offices; ▪ local four-year colleges; ▪ STEM academic departments; ▪ regional collaborations (e.g., Life Sciences Consortium of the North Shore); ▪ campus efforts to align with College and Career Readiness Standards of the Common Core Curriculum; ▪ student support services (e.g., leadership centers, tutoring centers, supplemental instruction); and ▪ campus capital improvement efforts (e.g., to construct a new allied health building).

Year 2 Plans

In the second part of the reporting template, sites were asked to provide an overview of their Year 2 (July 1, 2014–August 31, 2015) plans, a timeline of activities, an FY15 budget, and a budget narrative. This section summarizes sites' responses regarding their plans for Year 2. Sites were asked to include reflections on how their plans for Year 2 were shaped by lessons from Year 1, projections for Year 2 participant enrollment based on spring and summer 2014, plans for retaining Cohort 1 students, plans for recruiting Cohort 2 students, plans for summer 2015 programming, and plans for working toward the sustainability started with SSA in Year 1.

Answers were variable on these topics. In particular, site reporting on projected enrollment included a range of different indicators, perhaps due to different interpretations of the "projected enrollments" question. Two-thirds of sites reported projected or actual enrollment in fall 2014 of spring and summer 2014 SSA participants. Half of the sites reported on projected or anticipated summer 2015 participation. Two sites did not report either of these numbers. The basis for these numbers is sufficiently uncertain that, in order to avoid presenting misleading information, we do not attempt to summarize and report them here.

Site representatives commented on some overlap between the answers to questions in the Year 2 Plans section of the report template and previous sections of the template. For example, almost every site responded that their answer to the question about sustainability in Year 2 had been answered in the previous section. Accounting for these overlaps, site responses are summarized and presented here grouped into the following segments: projected changes for Year 2, plans to support and retain Cohort 1, plans to recruit Cohort 2, and plans for summer 2015.

Projected Changes for Year 2

Most sites planned to repeat many of the elements of their Year 1 SSA programs in Year 2 with some modifications. Almost every site reported starting recruitment and planning earlier in Year 2 than they were able to in Year 1. Changes to the schedule or content of SSA programs were also common modifications. The following broadly summarizes the major themes among the intended changes and provides a few examples within each theme.

Changes to recruitment. Strategies included beginning recruitment earlier, expanding the recruited group (e.g., include "non-traditional" or "new to college" students, expand the number of high schools, or increase diversity of cohort), changing eligibility/admissions criteria to recruit students with more consistent credentials or motivations, and improving relationships with high schools and high school administrators.

Changes to programming. Strategies included changing the schedule, timing, or order of SSA activities and programs (e.g., extending bridge program timing beyond the summer, extending the length of the day, starting earlier in summer); changing the structure of summer academy activities (e.g., reducing summer academy credit loads, changing mathematics placement strategy, switching from single topic to broader STEM focus); developing and aligning curriculum (e.g., developing new credit and non-credit course options, redesigning courses to attract different populations, aligning curriculum with high school or four-year colleges, developing or redesigning mathematics remediation), enhancing, expanding, or developing student supports (e.g., expand peer mentor program, enhance career development initiatives); and creating or developing more internship or research opportunities.

Changes to stipends or incentives. Examples included eliminating or reducing some stipends, adding textbook scholarships for summer bridge students with financial need, adjusting the timing of scholarships to include summer courses, and changing the type of incentives offered, from technology (e.g., tablet computers) to free courses or book store credit.

Changes to administrative structure or strategy. Strategies included building stronger relationships with industry partners, sustaining relationships with four-year schools, ensuring that administrative and logistics personnel are in place for the start of Year 2, and improving and augmenting tracking and assessment efforts that follow up with students about past experiences or help match them to future opportunities.

Plans to Support and Retain Cohort 1

Cohort 1 refers to the group of students who began participating in SSA programming during Year 1. In fall 2014 and spring 2015, most sites continued to offer support services along with STEM events, workshops, and social activities to these students. For example, SSA funding continued to support tutoring services, peer mentorship programs, supplemental instruction, career counseling, embedded learning specialists, and STEM advisors and coordinators. A few sites reported specifically tracking aspects of students' progress such as major declarations and academic performance. At about half of the sites, administrators reported that SSA coordinators remained in contact with Cohort 1 students, communicating informally and/or meeting periodically to assess their progress. Levels of student responsiveness to these kinds of outreach varied.

One site, Berkshire Community College, designed a fall support program for Cohort 1 students who completed their SSA summer bridge program. These students could earn a scholarship for a free course by meeting certain participation and GPA requirements. Participation requirements included attending cohort meetings, seminars, and field trips; completing regular progress reports with faculty advisors; completing community service hours; and meeting with tutors and peer mentors.

Many sites continued to offer STEM engagement opportunities during the 2014–15 academic year, such as field trips, clubs, social events, competitions, career exploration activities, workshops, or transfer information sessions. STEM club/group activity plans included hosting robotics competitions, designing a summer workshop for middle school students, recruiting Cohort 2 participants, designing activities for 2015 summer academies, and inviting/hosting guest speakers. A few sites supported SSA Cohort 1 students in applying for other STEM opportunities, such as workshops, research internships, or leadership programs. A few sites offered academic opportunities for Cohort 1 students, such as additional time with self-paced mathematics modules or scholarships for enrollment in STEM courses. Many sites included Cohort 1 students in winter and spring 2015 activities designed to engage Cohort 2.

Plans for Recruiting Cohort 2

Every site's plans for recruiting SSA Cohort 2 (students who begin participation in SSA in Year 2) involved some modification or augmentation of their first year recruitment plans, the main themes of which were captured in the "Projected Changes for Year 2" section above. The biggest challenge for many sites in Year 1 had been timing constraints—both the short window between receipt of funding and program initiation, and the mid-spring semester timing of the start-up period. Thus, overwhelmingly, sites reported beginning their recruitment activities earlier. Many began recruiting for winter, spring, or summer 2015 SSA activities during fall 2014. A few additional themes that emerged from sites' Cohort 2 recruitment plans are summarized here.

Include current or former SSA students in recruitment. About a third of SSA sites reported engaging current SSA students in recruiting the next cohort. Students informed the development of recruitment materials, gave testimonials at recruitment events, engaged with students from their own high schools, and generally spread positive word of mouth about SSA programs and activities.

Strengthen relationships with high schools. Most sites planned to renew their engagement with high school partners. These activities included hosting breakfasts with high school administrators and meeting directly with liaisons. Many sites planned to participate in or host STEM events at high schools and to engage high school students at CC events such as open houses. A couple sites planned to directly engage high school students through visits to classrooms.

Recruit a range of target populations. As with Year 1, most sites plan to recruit incoming students or individuals graduating from high school into SSA programs. At least a third of the sites plan to recruit from among their current CC students. A few sites indicated other intended populations, such as current high school students and adult students.

Modifications to program or application timelines. A couple sites planned to recruit at early acceptance events or to work with early entrance programs. Berkshire created an early application deadline (in addition to an end-of-May deadline) timed to coincide with other college application deadlines "to encourage students to think of BCC as a 'first option' rather than a 'fallback option.'" A few sites added intersession/winter SSA activities such as workshops and mathematics reviews.

Partner with specific individuals or organizations for recruitment. A few sites planned to use SSA funding to support individuals who could act as recruiters or liaisons for SSA or STEM programs. Greenfield paid faculty to visit local high schools. Mount Wachusett hired a dedicated STEM recruiter. Berkshire offered stipends to high school staff and faculty to act as liaisons.

Summer 2015 plans

Across sites, summer 2015 SSA plans involved mostly minor modifications to the activities and events held in summer 2014. Half of the sites planned to reprise programs that combined academic activities (e.g., mathematics or science coursework) with college readiness and STEM exploration activities. About a third of the sites planned to revisit or introduce STEM exploration experiences—primarily hands-on, interactive, and applied workshops and activities that ranged from a few days to several weeks. A third of the sites planned to revisit or introduce mathematics-intensive experiences, including mathematics "boosters" to help students raise their placement test scores and intensive, accelerated summer-term mathematics courses.

Appendices

STEM Starter Academy - Year 1 Site Report for *[College]*

The purpose of the STEM Starter Academy Year 1 Site Report is to review your institution's work with SSA in Year 1 and the plans you have for Year 2 of the initiative. We hope this opportunity to reflect will inform your site-specific evaluation efforts. As part of this reflection process, we encourage sites to review the original RFP issued by the Massachusetts Department of Higher Education (DHE) and the proposal narrative jointly submitted by the 15 Massachusetts community colleges.

Year 1 Site Reports will contribute valuable information to DHE's report to the Massachusetts Legislature in January 2015, and will also help inform the technical assistance strategy and evaluation efforts of the initiative as a whole.

REPORT SUBMISSION INSTRUCTIONS:

Please complete the information requested below and submit your reports by email to David Cedrone, dcedrone@bhe.mass.edu (with a cc to Jeremiah Johnson, jjohnson@donahue.umassp.edu) by the end of the day December 5, 2014. We encourage you to submit these reports as early as you would find helpful for your own planning purposes.

RESPONDENT INFORMATION:

Community College:

SSA Staff Contact Information:

SSA Role	First Name	Last Name	Email Address	Phone Number

SECTION I: YEAR 1 REVIEW

1. **Overview:**

Please provide a summary of your Year 1 activities (January – December 2014) funded partially or fully through your STEM Starter Academy award. Please include the following in your summary:

a. What are the main successes with the implementation of your STEM Starter Academy grant to date?
b. What are the main challenges with the implementation of your STEM Starter Academy grant to date?
c. Describe the most significant benefits for your institution as a result of STEM Starter Academy activities to date.

STEM Starter Academy - Year 1 Site Report for *[College]*

2. Spring Activity Detail:

Reflecting on your institution's spring 2014 activities, please describe the following:

a. Key activities and their goals and objectives
b. Strategies for tracking outcomes and outcomes to date
c. Lessons learned
d. Student successes that you have formally measured or informally observed
e. Major contributors to successes
f. Major contributors to challenges
g. Technical assistance or support needs from DHE
h. Participation (Please complete the following table):

Number of SSA primary participants served in spring 2014 SSA activities	
Number of SSA secondary participants served in spring 2014 SSA activities	

3. Summer Activity Detail:

Reflecting on your institution's summer 2014 activities, please describe the following:

a. Key activities and their goals and objectives
b. Strategies for tracking outcomes and outcomes to date
c. Lessons learned
d. Student successes that you have formally measured or informally observed
e. Major contributors to successes
f. Major contributors to challenges
g. Technical assistance or support needs from DHE
h. Participation (Please complete the following table):

Number of SSA primary participants served in summer 2014 SSA activities	
Number of SSA secondary participants served in summer 2014 SSA activities	

4. Sustainability to date:

a. Please describe your institution's efforts to make SSA programs and activities sustainable beyond the period of grant funding.

b. Have any of your SSA activities been embedded with or informed by other initiatives or programs at your college? If so, please describe. If not, please describe what is preventing the STEM Starter Academy activities from becoming embed with (or being informed by) other initiatives and programs (college, state or private grant funded).

c. Based on this first year of SSA implementation:

   i. Which parts of your SSA implementation are *most worth* sustaining? Please explain.
   ii. Which parts of your SSA implementation are *most likely* to be sustained? Please explain.
   iii. Are there elements of your program that you will modify based on your experience or choose not to continue? Please explain.

5. Student Experience Highlights

a. Please describe any reported or observed student experiences from your SSA implementation that illustrate the intent and impact of SSA.

Section II: Year 2 Plans

1. Overview of Year 2 plans

Please provide a **detailed description** of your institution's plans for SSA in year 2 (July 1, 2014 – August 31, 2015), including:

- How your plans for year 2 were shaped by lessons learned in year 1
- Projected enrollment of spring and summer 2014 participants in STEM programs for AY 2014/15
- Plans to support retention of "Cohort 1" students during AY 2014/15
- Plans for recruitment of "Cohort 2" for spring or summer 2015
- Plans for Summer 2015
- Plans for working toward the sustainability of the work started with the SSA grant

2. Year 2 Timeline

Please provide a timeline of planned year 2 activities

Time Period	Description of Activity
July-August 2014	
September 2014	
October 2014	
November 2014	
December 2014	

STEM Starter Academy - Year 1 Site Report for *[College]*

January 2015	
February 2015	
March 2015	
April 2015	
May 2015	
June 2015	
July 2015	
August 2015	

3. Year 2 Budget

Please attach your FY 15 budget to this report

4. Year 2 Budget Narrative

Please paste the summary narrative that accompanied your FY15 budget here. The narrative should explain the focus of your spending in FY15 in relation to recruiting a new cohort (#2) of students, how that new cohort is anticipated to increase and/or further diversify from cohort 1, how you plan to promote retention of the first cohort of students in AY 2014/15 STEM programs, and your plans for spending funds on summer bridge activities in the summer of 2015.

Please address what you learned from the initial cycle of SSA funding through your direct campus experience or through collaboration with peers at other campuses and how that is influencing how you are planning to spend your funds in FY15.

STEM STARTER ACADEMY

CROSSWALK BETWEEN YEAR 1 SITE REPORT AND SPRING/SUMMER 2014 SURVEY

Your college recently completed a survey on activities from Spring / Summer 2014 that can help inform your Year 1 report. This document provides a crosswalk between the information required for the Year 1 Site Report and the Spring / Summer 2014 survey. The crosswalk is intended to highlight information from your survey that may be helpful to you as you write your Year 1 Site Report. Please refer to the copy of your completed survey that was sent with this document.

The survey has five sections described below:

- Section 1: Spring 2014 Activities
- Section 2: Summer 2014 Activities
- Section 3: Summer 2014 Programs
- Section 4: Summer 2014 Program Elements
- Section 5: Reflections on 2014 Activities

Note that Section 3 may include up to ten programs, based on your response. The programs are numbered as follows: Program 1 is 3.1a to 3.1o; Program 2 is 3.2a to 3.2o, etc. To find certain information, you may need to look at your response under each program. For example, enrollment numbers are found in 3.1e, 3.2e, etc.

We have provided you with a further document titled "Activities funded through SSA" which summarizes the items you identified as being funded partially or fully through the STEM Starter Academy award. This should be helpful in answering the first item on the Year 1 Site Report.

If you have questions related to this crosswalk, please send them to either Jeremiah Johnson (JJohnson@donahue.umassp.edu) or Kristin Lieber (KLieber@donahue.umassp.edu).

Section of Year 1 Site Report	Spring / Summer 2014 survey
SECTION I: YEAR 1 REVIEW	
1. Please provide a summary of your Year 1 activities (January – December 2014) funded partially or fully through your STEM Starter Academy award.	See attached document - *Activities funded through SSA*. 3.1 to 3.10 (Summer programs)
a. What are the main successes with the implementation of your STEM Starter Academy grant to date?	1.12 (Spring successes) 1.14 (Outreach successes) 5.1 (Summer successes)
b. What are the main challenges with the implementation of your STEM Starter Academy grant to date?	1.13 (Spring challenges) 5.2 (Summer challenges)
c. Describe the most significant benefits for your institution as a result of STEM Starter Academy activities to date.	
2. Spring Activity Detail:	
a. Key activities and their goals and objectives	1.1 to 1.11 (Spring activities)
b. Strategies for tracking outcomes and outcomes to date	
c. Lessons learned	1.15 (Spring lessons learned)
d. Student successes that you have formally measured or informally observed	1.12 (Spring successes)
e. Major contributors to successes	1.12 (Spring successes)
f. Major contributors to challenges	1.13 (Spring challenges)
g. Technical assistance or support needs from DHE	
h. Participation	
3. Summer Activity Detail:	
a. Key activities and their goals and objectives	2.1 to 2.5 (Summer activities) 3.1 to 3.10 (Summer programs) 4.1 to 4.3 (Program elements) 3.1b 3.10b (Program goals) 4.4 (Required activities)

b. Strategies for tracking outcomes and outcomes to date	3.1c to 3.10c (Measures)
c. Lessons learned	5.3 (Summer lessons learned)
d. Student successes that you have formally measured or informally observed	5.5 (Student successes)
e. Major contributors to successes	5.1 (Summer successes)
f. Major contributors to challenges	5.2 (Summer challenges)
g. Technical assistance or support needs from DHE	
h. Participation	3.1e to 3.10e (Summer enrollment)
4. Sustainability to date:	
a. Please describe your institution's efforts to make SSA programs and activities sustainable beyond the period of grant funding.	
b. Have any of your SSA activities been embedded with or informed by other initiatives or programs at your college? If so, please describe. If not, please describe what is preventing the STEM Starter Academy activities from becoming embedded with (or being informed by) other initiatives and programs (college, state or private grant funded).	
c. Based on this first year of SSA implementation: i. Which parts of your SSA implementation are *most worth* sustaining? Please explain. ii. Which parts of your SSA implementation are *most likely* to be sustained? Please explain. iii. Are there elements of your program that you will modify based on your experience or choose not to continue? Please explain.	1.15 (Spring lessons learned) 5.3 (Summer lessons learned)
5. Student Experience Highlights. Please describe any reported or observed student experiences from your SSA implementation that illustrate the intent and impact of SSA.	5.5 (Student successes)

Section II: Year 2 Plans	
• How your plans for year 2 were shaped by lessons learned in year 1	1.14 (Spring lessons learned) 5.3 (Summer lessons learned)
• Enrollment of spring and summer 2014 participants in STEM programs for AY 2014/15	3.1e to 3.10e (Summer enrollment)
• Plans to support retention of "Cohort 1" students during AY 2014/15	4.5 (Cohort) 5.4 (Continued engagement)
• Plans for recruitment of "Cohort 2" for spring or summer 2015	
• Plans for Summer 2015	
• Plans for working toward the sustainability of the work started with the SSA grant	
2. Year 2 Timeline	
July-August 2014	3 (Summer programs)
3. Year 2 Budget	
4. Year 2 Budget Narrative	

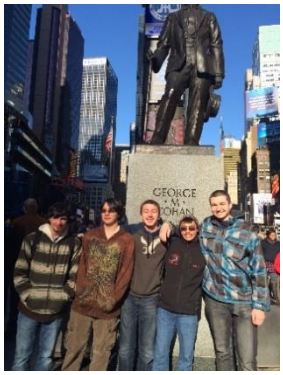
Student Experience Highlights from Year 1 Site Reports

In the Year 1 Site Report Template, SSA sites were asked to describe any reported or observed student experiences that illustrate the impact and intent of SSA. Site responses varied in length and form, with some including pictures, stories, and even student poems. Some sites included students' stories in the sections of the report that asked about "Student Successes" and referenced these in the "Student Experience Highlights" section; those are included in this appendix as well. To capture the richness of these data, sites' responses are presented here lightly edited and formatted for readability, but otherwise in their entirety.

Berkshire

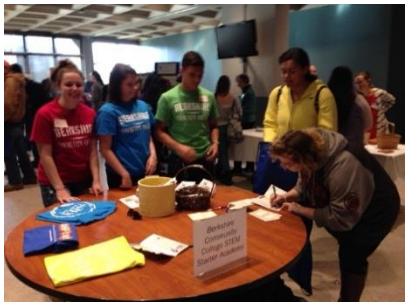
Some students have become the voices of our SSA program. Allison S., for example, originally felt that having to choose BCC was a failure for internal and external reasons. However, she expressed to a group of high school personnel that she changed her opinion about BCC after participating in the summer program. Another student, Crystal T., only came to BCC because of some circumstances at home which needed her attention and therefore she was unable to go away to school in September. She was only going to come to BCC for one semester, maybe two at the most. She is now planning to stay the whole two years because the experience has been so positive. She has also settled on engineering as her major. Michael Z. spoke to the Trustees in September, expressing his satisfaction with the program and the difference it made when he began his college career. Sebastian Z. spoke to students at Lee Middle and High School. He emphasized that the SSA was an opportunity that shouldn't be missed. He told them it gave him the confidence and the support to be successful.

Exposure to STEM – Trip to Museum of Math in NYC



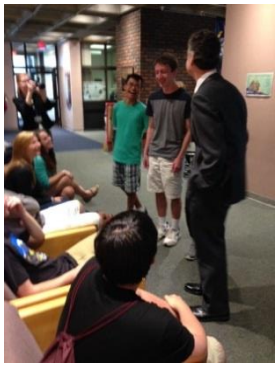
Twelve SSA students and four SSA mentors (STEM Scholars), plus other students and faculty took a field trip to NYC's Museum of Math on November 15, 2014. Some of the SSA students had never been to NYC, and none had ever been to a math museum. This trip was organized by Dr. Frank Morgan, a Williams College professor on sabbatical teaching and leading at BCC. Major funding came from the SSA grant.

Exposure to STEM Careers – STEM Career Fair

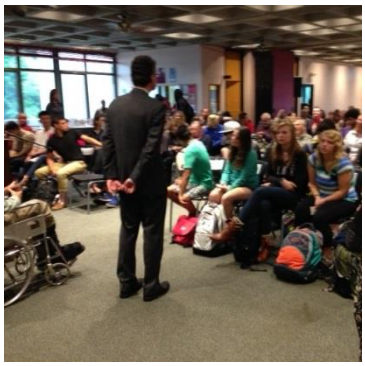


All SSA students must participate in service learning activities. Most have chosen to fulfil this requirement by helping to recruit the 2015 SSA cohort. SSA students (in the red, blue, and green SSA t-shirts) are seen here encouraging other students to consider the 2015 SSA at BCC. Fourteen SSA students assisted at the STEM Career Fair held on November 21, 2014, at BCC. Over 300 students from area high schools came to this fair. Seventy-five students filled out forms requesting more information about SSA. Major funding for the Berkshire County STEM Career Fair came from the SSA grant. The fair is organized by Addie Van Deursen, CVTE coordinator.

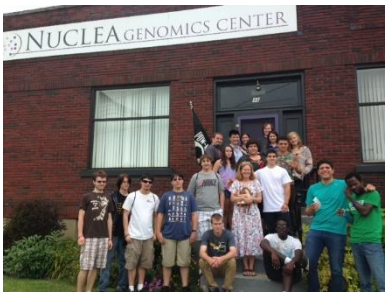
Retention of Students – Success Seminars



SSA students are required to attend Success Seminars either on campus or in the community. The purpose is to increase self-confidence and teach strategies that will help them attain their goals. SSA students sat in the front row as "the invited guests," listening to Edward B. Burger, president of Southwestern University speaking about his book, *The 5 Elements of Effective Thinking* (right). At left, Dr. Burger speaking with SSA students prior to his all-college presentation.



Industry Exposure



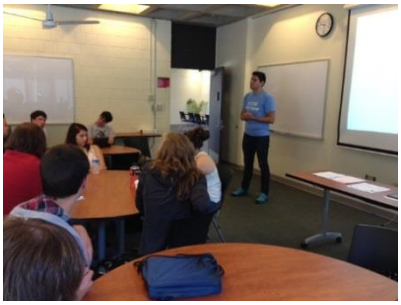
SSA students and their mentors, STEM Scholars, were able to visit and tour NUCLEA (left). NUCLEA is a translational medicine company dedicated to the discovery of proprietary markers and in vitro companion diagnostic assays based on corresponding gene and protein expression profiles associated with individual's tumor or specific disease state. Internships are available. This field trip was part of the summer STEM Explore.

Building Connectedness

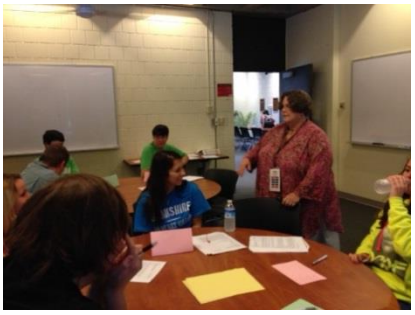
Two very wet students, Sebastian and Midjensky, after our SSA's ALS challenge (left).

Full group photo at end of BCC 101 week (top right).

Stem Scholar, Juan C., sharing "his story" with SSA students. Sharing "our stories" was a very impactful part of the summer BCC 101 experience (bottom right).

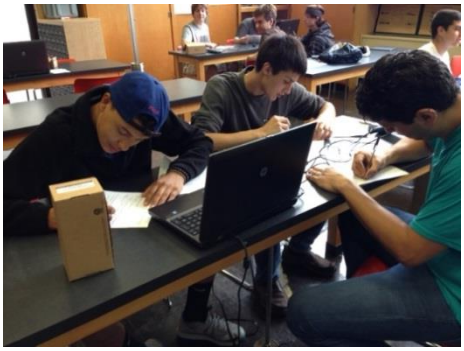


Feeling Competent and Capable



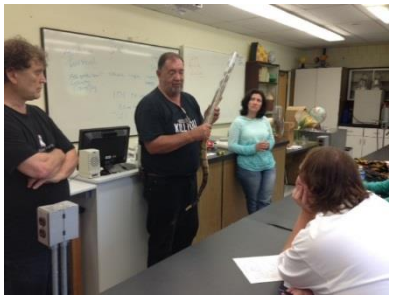
SSA students participated in professional development with Khaki Wunderlich, a national trainer for StrengthsQuest (left). Students identified their 5 major strengths through an online program and then were taught how to use these strengths to reach their goals.

Hands-On STEM Experiences



Students in the biology lab with Professor Foley as part of the Summer STEM Explore (left).

Learning to count rattles in the environmental lab during STEM Explore led by Professor Tom Tyning (right).



Bristol

The cohort experience appears to play a positive role for some students. Students in the summer Bridge program developed connections with other students in the program (many times degree specific) who they have continued to work with since starting classes this past fall.

In particular, three students from the summer bridge have helped to establish the new STEM Club on campus and have taken on leadership roles with the club. Working with faculty summer bridge students created the new student STEM club to support other students interested in STEM degrees and careers. At the same time, BCC was approached and asked if we would be interested in becoming a regional qualifying VEX Robotics Competition location for southeastern MA. Students in the club quickly embraced the idea of having the club support the VEX competition and they plan to work with the college to run competitions by becoming competition judges and support staff. Our plan is to offer our first VEX Scrimmage Event on January 31, 2015, at BCC.

Bunker Hill

Students have been very appreciative of the opportunity they were given through SSA. Students from one of the math clusters bought their professor flowers and threw a party on the last day of class. One of those students was Chris, a 48-year-old father of three, who was going back to school to major in a STEM field so he could fulfill his dream of finally having a stable, well-paid career. He wrote a poem for his professor about his experience in the class:

> *A simplistic life's lesson can turn into a defining moment in life. Having experienced some of life's most undesirable situations. But you have taught us the Why and not The How, and now I have an answer to the question. W stands for willing. Willing to let this quirky unconventional but loving teacher retrain my thinking. (Right to Left, Bottom to the Top, and all over the board.) H stands for the habits. Habits that I've practiced doing for decades. Most of which aren't always helpful in figuring things out. And the Y. Why ask Why? Because when you learn the Why, it becomes crystal clear why you do what you do. Your drive has driven me to want to do better. So my question today is not how come, not even the Why, because I now know the why. I showed up no matter what and experienced you and the why. Having done that I have seen how come. In this blip of time on life's clock, you have made a lifetime impact on Me and my Children.*

This student was also one of the first to volunteer when BHCC needed a focus group for UMDI's site visit in November 2014. He not only appreciated his experience in SSA, he is now an advocate for other students to participate in it.

Cape Cod

The students who completed Summer Bridge were able to take other required courses in fall 2014 and make more progress in their program in fall 2014 than they would have been able to do if they had not completed a summer course. The summer course stipend also allowed students to focus on their coursework and academic programs instead of part-time summer employment.

Students who were recruited in fall 2014 participated in meetings that many students found very helpful for understanding pathways, transfer, and careers. Students certainly appreciated the financial support provided as this allowed them to take more courses and make more progress in their program than they would have been able to do without the financial support from STEM starter. From meetings and coordinated events, students also developed a sense of community around STEM. For example, students developed connections with others and identified common interests. A small group of STEM starter students met outside of the SSA meetings to participate in the Community College STEM Innovation Challenge and they worked throughout the fall developing their problem statement and solution. The STEM starter made these connections possible for students, and they benefited from this design and application experience in ways that extend beyond their coursework here to support them in thinking about possibilities for careers and opportunities beyond Cape Cod Community College.

Greenfield

Many 2014 STEM Starter Academy participants indicated that the friends they made through the program encouraged them to come back to GCC and to feel more comfortable in the college setting.

- We had a rising junior who had done quite poorly in her first two years of high school. As we did not require a minimum high school GPA, just ability to place into the course, she was able to enroll in college-level precalculus and successfully completed the course with a B+. Upon returning to high school this fall she has redoubled her efforts and her parents/teachers/guidance counselor have all noticed. If she continues to improve her high school GPA this year. Her guidance counselors will support her application to our early entrant program for fall 2015. This summer program turned her around academically.
- We had a participant who was recently released from juvenile detention for violent crime. His participation in this program was part of his ongoing efforts to turn things around for himself. He is now in a new high school and living in a residential treatment facility. His high school is requiring him to spend the fall semester establishing an academic record, but he has applied for the early entrant program for the spring. He has found a haven here at GCC and spends much of his free time in our library or hanging out on campus visiting with faculty and staff he met during the summer program. The STEM Starter Academy helped him to prove to himself that he can go to college and he is working hard to hopefully return here in the near future. We look forward to being a part of his education.
- *"In previous science classes I was very, very bored and uninterested in the sciences and science-related classes. After taking (and during!) the class, I got really excited about science and have begun looking through science news sites regularly and watching 'The Cosmos' show!!"* – 2014 STEM Starter Academy student who took our new "Cosmic Life Becomes You" course (exit survey).

- *"I didn't know what I didn't know until I took Math 095. I got really solid in my math skills taking that class and studying in the Math Studio. It really empowered me and helped me realize that math and science are achievable career paths. I had written off science and math as something I couldn't do. Now, I can consider math and science fields as a major or a career, and I realize that they're attainable."* – 2014 STEM Starter Academy student who took our "Introductory Algebra" course (interview).

Holyoke

Jessica graduated at the top of her class at the age of 15 in Nigeria and then moved to Springfield, MA with her family. For the next two years Jessica developed her plan to attend college with the goal of studying biology and, later, applying for medical school. Jessica learned of the STEM Summer Academy (SSA) being offered at Holyoke Community College in July during the process of registering as a new student for the fall 2014 semester and enrolled in the summer academy *GeoTracks* course.

Bemie Enyong, the Career Development Counselor at HCC whose workload includes SSA, met Jessica along with 46 other students during an introductory Career Exploration Activity that she conducted during the kickoff of HCC's SSA classes. Later in week one, Ms. Enyong was approached by another SSA student, Tiffany, a Ghanaian student, who was requesting additional assistance with career exploration. Upon learning that the career counselor's background is Nigerian, Tiffany brought Jessica to meet Ms. Enyong. They had an informative conversation about Nigerian culture and current events after which they spoke about Jessica's academic and career goals.

It is interesting to note that for the duration of the STEM Academy summer session, both students came to Ms. Enyong's office several times a week after their classes to talk about their goals and about how their classes were going, or just to say hello. Ms. Enyong discerned that they felt a sense of comfort and ease at being able to "check in" with her periodically. Both were excellent students and showed a great deal of aptitude for the sciences, so clearly the support they needed was not of an academic nature but rather of a social and cultural nature.

Ms. Enyong has seen Jessica several times during the semester just to catch up. Recently during a STEM event, when meeting someone here on campus, Jessica referred to Ms. Enyong as her "college mother"; within the context of their shared culture this made perfect sense as there is an expectation that the older generation shepherds and assists the younger generation. It very powerfully brought home to Ms. Enyong how important it is for students from underrepresented groups to see themselves reflected in the composition of not only the student body, but of the faculty and staff who contribute to their learning and growth.

Jessica shows, early on in her academic career, an aptitude for excelling in science and math classes. Having earned an A in her summer course and with a current 4.0 GPA for her first semester she is on track to become a strong STEM student at HCC. During the semester Jessica became interested in the laboratory research she did in her organic chemistry and biology classes related to photosynthesis. Jessica was referred to Donna Kirk, the STEM Outreach Coordinator, who, seeing her promise, suggested that she apply to the January 2015 Mini-Semester program at Brookhaven National Laboratory, in Long Island New York. As an alumna of the program herself, Ms. Kirk is aware that the mission of this program is to invite a diverse population of students to learn about the scientific research being conducted by a range of scientists at this renowned national laboratory. Jessica eagerly applied, receiving warm recommendations from two of her science faculty and the support of her parents. Although Jessica has just learned that in fact she was not accepted for this year's Mini Semester program, the program director

indicated she will be a strong candidate for next year's program after completing additional math courses in precalculus and calculus.

Massasoit

Quotes from Students

Math Experience. In the concluding survey, 83% of STEM students indicated that their ability and skills in math improved.

- *"I learned that, in a self-paced curriculum, I am motivated enough to complete my work and achieve high marks in the class."* – SSA Student
- *"I am better at math than I thought."* – SSA Student
- *"I've learned I actually like math, I just needed to see real life applications for mathematics."* – SSA Student

Career Exploration. Kirstin Peterson, a scientist at Harvard University said, "I was really impressed with the enthusiasm of your students. One student even followed up and wrote me a very nice email saying that the robotics talk opened his eyes to a whole new field of possibilities."

- *"I want to pursue a STEM career because I want to wake up loving my job like every person I met during STEM."* – SSA Student
- *"I want to pursue a career in a STEM field because I like math now and I'm confident that I will do well in any STEM field. This program has made more excited about pursuing a career in a STEM field."* – SSA Student

Academic Exploration.

- "*I enjoyed touring Stonehill College…because of the tour I now have my goal set for the future, being accepted into Stonehill's neuroscience program."* – SSA Student

MassBay

The following quotes are excerpted directly from students participating in the STEM-Genzyme/Sanofi Mentor Program, an SSA funded collaboration that began in the spring of 2014.

- *"The STEM/Genzyme Mentor Program has been an absolute blessing for me. The guidance coming from my mentor has been so integral to my future college plans. Whenever I have questions pertaining to financial aid, expected workload, or honestly anything, I now have somebody to ask. Also the STEM Mentorship Program has allowed me to broaden my connections with people I would never have been able to meet where I am now."* – MassBay Student, General Studies
- *"I love this program because it's very inspiring to see individuals who sincerely believe in helping others succeed at accomplishing a goal. My mentor is awesome; he is extremely helpful not just with my education, but [also with] providing encouraging words of wisdom when I find myself facing adversity."* – MassBay Student, Electrical and Computer Engineering
- *"My family emigrated from Brazil a few decades ago… an obvious setback to being the first generation to go to college is that we couldn't ask our family for guidance. So having a mentor*

who has been through the trials and tribulations of the college system is very helpful." – MassBay Student, General Studies

- *"When you need someone to talk to you can always email your mentor and he/she is able to help you… you are able to have fun with your mentor… go to movies, out to lunch and sometimes they will buy you lunch."* – MassBay Student, Information Technology
- *"I am thankful for the Stem/Genzyme mentor program because it provided me with a mentor and it also gave me an opportunity to learn how to write a resume for a job/internship. This is a great program and it benefits me in a lot of ways."* – MassBay Student, Electrical and Computer Engineering
- *"The mentorship program between MassBay and Genzyme helped shape my career goals. I have met with wonderful professionals at Genzyme that have given me career and academic advice. As one of the world's third-largest Biotechnology companies, I had the chance to tour their facility at the Framingham location with a fantastic mentor. We talk about our lives, career path, and our future goals. I believe this mentorship program will help me grow into a professional world. Thanks."* – MassBay Student, Computer Information Systems

Middlesex

Summer Bridge

Program participants were given pre/post-program evaluations. Some outcomes highlights from the SB evaluations include students stating that they gained more knowledge about academic programs/career opportunities in STEM, more knowledge about support services at MCC (e.g., Pathways Center, tutoring services), hands on laboratory experiences, confidence in pursuing STEM/selecting a major, knowledge about how to pursue a relevant internship/write a resume, and a greater sense of belonging to the MCC community. The following are examples of direct quotes from students surveyed at the end of our Summer Bridge sessions:

- *"Motivation/eagerness to start the year and become a part of the STEM community here."*
- *"Better understanding of [STEM] and a better idea on what I want to major in."*
- *"I learned that science is still growing and it keeps on changing and that the world today revolves around science."*
- *"I really enjoyed to work and study with [these] people… this program was a really [good] opportunity for me to improve my skills."*
- *"I've made a lot [of] connections. Thank you for this awesome experience."*
- *"I learn about new programs that can help me success in my career."*
- *"It helped me to develop a sense of belonging at MCC [and learn] all the opportunities available that I didn't know about."*
- *"I'm glad to attend this. I learned so much about different [areas] in STEM like the clinical lab and environmental science."*

Career Fairs

Informally, students responded positively to the career fairs as a means to explore career opportunities in their field and they look forward to future career fairs and career development support from the program.

UMass Lowell laboratory skills workshops

Post-workshop evaluations were given to students. The results were positive where majority of program participants (more than 80%) strongly agreed that the workshops were useful to their studies and reinforced their desire to pursue careers in STEM/Health. Participants indicated they valued the hands-on experience, ability to learn/use lab equipment, and wished to make the program longer/have more workshops available.

Math Boot Camp

Program participants took pre and post-tests that assessed their math level and number of remedial math classes needed. Math Boot Camp (MBC) participants scored on average 29 points higher in the College Placement Test and eliminated more than 50% of remedial classes. Additionally, MBC participants who spent an average of 20 hours in the program did 42% better on the College Placement Test. MBC program evaluations were also given out and all students "agreed" or "strongly agreed" that the program was a "valuable academic opportunity."

Mount Wachusett

MWCC's Marketing Department is preparing a marketing campaign for the March 6th STEM Awareness Event and Summer 2015 Program. Part of the campaign involves outreach to the Summer 2014 SSA cohort in order to capture testimonials and relate personal experiences. Once the marketing campaign is complete, we will share the results with Associate Commissioner Cedrone and the Department of Higher Education.

North Shore

Math Boot Camp

All students who participated in the summer math boot camp made progress toward their individual goals. At the end of the summer session 26% were able to go directly into college-level mathematics and the remaining students had the opportunity to finish their remediation requirements the following fall. This program significantly shortened the students' overall time in pre-college coursework.

A health science student commented,

> *"Boot Camp is helping me a great deal. I feel as though I have learned an immense amount since starting this course a little over two weeks ago. When I was in high school I was in remedial math courses up until I graduated, partially due to my lack of attention. This Math Boot Camp is giving me the chance to improve my math skills by providing me with the tools and instructors which work in conjunction to help me learn. When I started this course I couldn't properly perform division, and algebraic equations were like a foreign language to me. I am amazed at how quickly I have learned to perform these equations, which don't seem quite so scary any more. I am so very thankful that NSCC has decided to try this type of program, because without it I do not think I could attain the level of mathematical proficiency (in two weeks' time) that I have."*

This student had the opportunity to take college level mathematics this fall.

Dual Enrollment

Our Introduction to Engineering (EGS101) Dual Enrollment summer course was very successful at increasing awareness of STEM fields. Students from this course were interviewed by the Lynn Item. One of Lynn HS students told the reporter that he likes the program and likes the idea of being an engineer, "they create the future. They design everything. They're the ones that have a hand in it all." Full article can be seen at: http://www.itemlive.com/news/high-schoolers-get-feel-for-engineering-at-nscc/article_7c5a2d38-1924-11e4-b754-001a4bcf887a.html

Varian Semiconductor Equipment Co. hosted the EGS 101 students on site and Elaine Webb, Senior Product Quality Engineer, provided the following press release:

> "Applied Materials – VSE Gloucester Manufacturing and Engineering hosted a group of 31 students, a professor, and the STEM Program Coordinator from North Shore Community College (NSCC) on July 15th. The students are part of a DUAL enrollment program at NSCC [funded by the STEM starter academy]. These are high school students (grades 10-12) taking Introduction to Engineering this summer at NSCC for college credit. Intro to Engineering is a 2-credit course where students learn about engineering careers, the engineering design process, and obtain an introduction to problem-solving techniques used in engineering. The students were welcomed and given an overview of what we do in Gloucester at Applied Materials Varian Semiconductor Equipment. Applied Materials engineers represented a wide array of disciplines; operations, manufacturing, facilities, wafer environment, systems, design, assembly, customer demo, and quality engineering, and roles; interns, engineers, Fusion engineers, leads, supervisors, managers, directors. The tours included the flow line manufacturing areas and the cleanroom. The follow up discussion with the students focused on what engineers do in Gloucester, college paths, career paths, and most prominently the excitement and passion we have about our careers and the opportunities an engineering education presents. The students kept the questions rolling in right up until they had to get back on their bus to head over the bridge and back to the NSCC campus in Lynn, MA."

She included the following comments in her email containing the press release information "Great group today. So glad they were asking questions—BEST group we've had for asking questions." The students echoed her enthusiasm for the experience when they returned to class.

Peer Mentor Program

Frederick Miranda, our STEM Starter Academy Coordinator has worked very closely with our STEM peer mentors and has provided this statement:

> The Peer Mentor Program consists of five mentors, who under my supervision support STEM students in reaching their academic goals. Generally, mentors help students with key gateway STEM courses in their field. These courses usually consist of introductory courses or those that are particularly difficult. Mentors provide support by assisting STEM students in the tutoring lab, advising students, and providing council in order to ensure their continued success in the program.
>
> One of the main goals of the program is to help students from less privileged environments gain the experience and support needed to succeed in college. Through the dual enrollment program, these students can begin their academic careers early. However, many underprivileged students can find it difficult to succeed at the college level for a variety of reasons. This is where our mentors shine. They understand the difficulties faced by students entering the STEM program and use their experience to provide valuable guidance to students throughout their time at North Shore

Community College. With the support of the Peer Mentor Program, high school students who never believed they could further their education, now see college as a very real option for their future.

Every week I have both faculty and students stop by to thank the mentors and myself for the help we provide. We have had a number of successful students come out of the program. One young man from a low-income household in Lynn had previously attended college at another school. Unfortunately, he failed his classes and dropped out soon after because he did not have the support he needed to succeed. Recently, he enrolled in one of our STEM courses and received guidance from a peer mentor in the program. He successfully completed his class [summer] and is now enrolled full-time North Shore Community College [fall] and is volunteering as a peer mentor. These are the success stories we want more of and that I believe the Peer Mentor Program can provide.

Quinsigamond

We have sponsored several guest lecturers to speak about various careers within STEM. Of particular note, was a computer science professor from WPI [Worcester Polytechnic Institute] who came and spoke about data science. We had a large turnout (over 60 students) for this event. Anecdotal evidence revealed that most students had not been exposed to data science previously. Through SSA, we are definitely making students aware of opportunities in STEM that they had not previously thought about.

One of our guest lectures was held in Southbridge. The STEM Starter Academy is very interested in promoting activities for the QCC students in Southbridge. We had a decent turnout, and feedback from the students in attendance was very positive. They indicated that they would support more activities in Southbridge.

Roxbury

The Summer STEM Academy students were motivated to attend their afternoon internships at Tufts Dental clinic and other locations.

Springfield Technical

One story of which we are quite proud is one of a student, a Latino male, who had originally decided to "no show" on the first day of our summer bridge program. He originally accepted our invitation to participate. However, his working hours intersected with the daily schedule of the program, leading him to the decision to quit. The director called him to inquire whether he would participate. The student decided to rejoin after having missed the first two days of math review and College Success coursework. However, he flourished in the program. He brought enthusiasm for learning, and excelled. He even led tutoring sessions for some of his friends who were not doing well in Math. By the end of the summer, he had earned a 3.42 GPA. He is now a math tutor for SSA.

Another student, a Latina, spent time over the summer with students who did not fully take advantage of what SSA has to offer. Despite her association with this clique, she completed the summer with a 3.61 GPA. She attended a recent Mount Holyoke recruitment event, expressing interest in attending the institution. She has also recently mentioned that she was invited into STCC's Honors program.

Another Latina—who became a biotechnology major after meeting Lisa Rapp, chair of STCC's biotechnology program during our summer speaker series—noted that her experiences with study groups

during the summer bridge motivated her to take the initiative to develop study groups for her FA 14 courses.

We sponsored a trip for six female students and our STEM coach as chaperone to the annual conference of the Society of Women Engineers (SWE) this past October. After returning to campus, one of the participants mentioned,

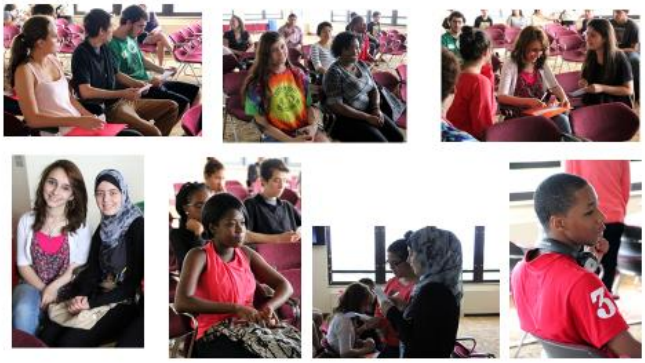
> *"It is a great experience and helps grow our careers. I learned a lot this trip would love to do something like it again. My favorite part of the conference was the career fair. Seeing all of the companies that need engineers made me realize that I'm in the right field; engineers are needed everywhere. I also really like the keynote that the COO of SpacEX gave."*

We are also working with one of our faculty members, Beth McGinnis-Cavenaugh, to launch a local SWE Collegiate chapter.

A number of SSA students attended a recent REU [Research Experiences for Undergraduates] presentation on our campus. The presentation was a culmination of the REU completed by selected STCC students through a UMass-STCC collaborative program, the Biological and Soft Matter Research Traineeships (B-SMaRT) REUs. There, SSA students met with current physics faculty from both institutions and also saw the poster presentations that the REU students developed, based on the work they did.

Photographs highlighting the students' participation in the STEM Starter Academy.

Orientation Day: June 26



A Visit with Governor Patrick and STCC President Rubenzhal: July 11

Boston Science Museum: July 25



Engineering Technologies class with Professors Haddad and Cooper: August 7

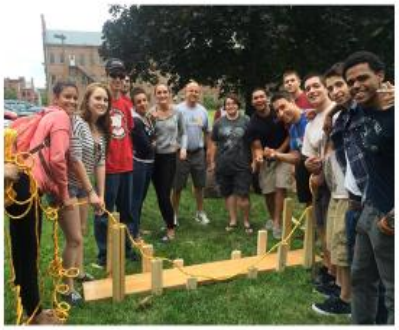












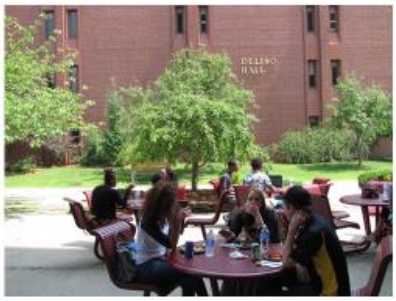

Trip to MicroTest Laboratories, Inc.: August 8




UMass Trip: August 15

Activities throughout the summer, in-class and outside







STEM Starter Academy, DHE Interview, September, 2015

Introduction

- Thank you for taking the time to speak with us today.
- The purpose of this interview is to deepen our understanding of what's happening with the STEM Starter Academy Initiative. In particular, we're interested in DHE's perspective on issues such as successes and challenges during Year 2. We would also like to hear about lessons learned by DHE that you think would be most important to share with others who are trying to do similar work.
- Findings from this interview will be included in our Year 2 Annual Evaluation report, briefly summarized in the Year 2 Evaluation Report Supplement, and possibly included in other products from the evaluation. Since you are our only DHE interviewee(s), we will be unable to report information from this interview in a confidential manner. However, in the event that you would prefer for a particular response to remain confidential, please let us know, and we will honor your preference for confidentiality.
- Ask permission to use tape recorder.

Overall reflections on program implementation

1. At the end of the second full year of program implementation, what do you see as the major successes of the SSA initiative for DHE and for the sites?
2. At the end of the second full year of program implementation, what have you seen as the major challenges of the SSA initiative for DHE and for the sites?
    - How have these challenges been overcome and midcourse corrections undertaken?
        - Possible follow-up (ask if 9c cuts are not addressed): We know that DHE and the sites were impacted by 9c cuts during Year 2. How was this challenge addressed, and to what extent to you think DHE and the sites overcame this challenge?
3. What key decision points did DHE face during Year 2 in terms of providing program support and facilitation?
    - Possible follow up (if not already addressed): how were these decisions resolved? What do these decisions reflect about DHE's priorities for the SSA initiative?
    - In addition to what we just discussed, what changes, if any, did DHE make from its original plans for the SSA initiative during Year 2, and why? Did the changes have their intended effect? Have there been any surprises?
4. What successes and challenges has DHE faced in terms of facilitating sites' efforts to implement and share best practices for community college student success in STEM fields?
    - Possible follow-up (ask if working groups and/or technical assistance gatherings are not mentioned): In what ways and to what extent have the working groups and technical assistance gatherings facilitated sites sharing of best practices?

Reflections on Sites

5. What promising practices do you see emerging from the SSA initiative? Can you provide a few details of how they came about, and their relation to existing SSA sites? What suggests to you that these are promising practices?

6. What differences have you noted in program features, implementation, and contextual variables that you think might impact progress or outcomes differently at the various campuses?

Looking forward

7. What have you learned that will inform DHE's plans for supporting the implementation of the SSA initiative moving forward?
    - Based on what you've learned, what are your plans for supporting the implementation of the SSA initiative moving forward?
8. As the SSA initiative completes its second year, what do you see as the prospects for sustainability of the various pieces of this initiative beyond the funding period? (e.g., DHE oversight and coordination of SSA efforts, programs and activities at various sites, evaluation activities, cross-site collaboration and sharing of best practices)
    - What are DHE's priorities for sustaining SSA supported programs and activities?
    - In your view, what are some positive steps that DHE and the sites have already taken with regard to improving prospects for sustainability?
    - In what ways has DHE integrated the SSA initiative with other STEM pipeline development and support efforts?

Concluding items (if time allows)

9. Do you have any feedback on the evaluation during Year 2?
    a. Can you tell us what has been useful about this year's evaluation?
    b. What would you most like to learn from next year's evaluation?
10. Have there been any important recent developments at any of the SSA sites that the evaluation team should know about?
11. Is there anything we haven't discussed that you think would be important for us to know as the evaluators of the SSA initiative?

DATA DICTIONARY:
STEM Starter Academy Activity

Release 5.0

LIST OF DATA ELEMENTS

STM001 College ID

An institutional identification code, as assigned by the DHE

STM002 Year (Calendar Year)

The calendar year in which the activity was offered

STM003 Term

The academic term in which the activity was offered

STM004 Student's Social Security Number

The student's social security number

STM005 Student ID

Identification code assigned to the student by the institution

STM006 STEM Starter Academy Aid

Indicates whether or not the student received direct STEM Starter Academy support

STM007 Extra Support

Indicates whether or not the student received extra support

STM008 STEM Pathway or STEM Career Counseling

Indicates whether or not the student received targeted STEM pathway and/or STEM career counseling

STM009 Previously Secondary Participant

Indicates whether or not the student was previously reported as a secondary STEM Starter Academy participant

STM010 Developmental Math Intervention Participant

Indicates whether or not the student participated in a STEM Starter Academy-sponsored developmental math intervention (e.g., developmental math course, non-credit workshop) during the current reporting period (summer, 2015).

STM011 Developmental Math Completer

Indicates whether or not the student participated in a STEM Starter Academy-sponsored developmental math intervention (e.g., developmental math course, non-credit workshop) during the current reporting period (summer, 2015), and fulfilled all developmental math requirements for your institution by the end of the current reporting period (summer, 2015).

STM001 College ID

An institutional identification code assigned by the Data Dictionary Appendix A: Institution Codes

Data Type: Numeric **Length** Minimum 3 Maximum 3 **Format Example** 000

Code Descriptions

See **Data Dictionary Appendix A: Institution Codes**

Definition

Code used to identify each college or university in the Commonwealth of Massachusetts

Instructions

Business Rules	Dependency
Mandatory entry	Must match College's ID as specified in Data Dictionary Appendix A – Institution codes. Every record submitted must be the correct college ID and be the same college ID throughout the entire file.

STM002 Year (Calendar)

The calendar year in which the student participated in any primary STEM Starter Academy activity/event

Data Type: Numeric **Length** Minimum 4 Maximum 4 **Format Example** YYYY

Code Descriptions

Definition

Instructions

Business Rules	Dependency
Mandatory entry	Each record must be the correct year as chosen when the file is submitted, not be a year previously submitted, and each record must have this same year.

STM003 Term

The term in which the events took place

Data Type: Numeric **Length** Minimum 1 Maximum 1 **Format Example** 0

1 Fall
2 Winter
3 Spring
4 Summer

Definition

Select **"Fall"** for STEM Starter Academy activities/events from September through the end of the Fall term.

Select **"Winter"** for STEM Starter Academy activities/events that occur during winter term (or intersession).

Select **"Spring"** for STEM Starter Academy activities/events that occur during the spring term.

Select **"Summer"** for STEM Starter Academy activities/events that occur during the summer. These events/activities typically have a start date of May or June and end in July or August (for a 12-week course). Summer activities may cross over summer sessions.

Instructions

Business Rules	Dependency
Mandatory entry	Must be one of the above values. Each record must be the correct term as chosen when the file is submitted, not be a term/year combination previously submitted, and each record must have this same term.

STM004 Student's Social Security Number

The student's social security number

Data Type: Numeric (Must include leading zeros) **Length** Minimum 9 Maximum 9 **Format Example** 000000000

Code Descriptions

Definition

Unique identification number assigned by the Federal government to each citizen and permanent resident of the United States

Instructions

Business Rules	Dependency
Mandatory entry If the student does not have a Social Security number, enter 000000000. **DO NOT** enter an identification code assigned by the institution for this item. Institutionally assigned identifiers should only be reported in the Student ID data element.	First three digits must be between 001 and 899 (excluding 666), middle two digits must be between 01 and 99, and last four digits must be 0001 and 9999. .

STM005 Student ID

Identification code assigned to the student by the institution

Data Type: Alphanumeric **Length** Minimum 1 Maximum 15 **Format Example** 000000000000000

Code Descriptions

Definition

Unique code used by the institution to identify students. Institutions may either use social security numbers for this purpose or an institutionally assigned identifier. Although this practice is allowed, it is not recommended.

Instructions

Business Rules	Dependency
Mandatory entry	Must be unique for each student submitted. Must be > 0 digits and <= 15 digits.

STM006 STEM Starter Academy Aid

Indicates whether or not the student received direct STEM Starter Academy support

Data Type: Alphanumeric **Length** Minimum 1 Maximum 1 **Format Example** N

Code Descriptions

Y Yes
N No

Definition

Did the student receive direct (STEM Starter Academy grant subsidized) financial support (e.g., grant, stipend, tuition or fee waiver, etc.)?

Instructions

Business Rules	Dependency
Mandatory	Must be one of the values above

STM007 Extra Support

Indicates whether or not the student received extra support

Data Type: Alphanumeric **Length** Minimum 1 Maximum 1 **Format Example** N

Code Descriptions

Y Yes
N No

Definition

Did the student receive extra or targeted supports (e.g., academic tutoring, peer mentoring, etc.)?

Instructions

Business Rules	Dependency
Mandatory	Must be one of the values above

STM008 STEM Pathway and/or STEM Career Counseling

Indicates whether or not the student received targeted STEM pathway and/or STEM career counseling

Data Type: Alphanumeric **Length** Minimum 1 Maximum 1 **Format Example** N

Code Descriptions

Y Yes
N No

Definition

Did the student receive targeted STEM pathway and/or STEM career counseling?

Instructions

Business Rules	Dependency
Mandatory	Must be one of the values above

STM009 Previously Secondary Participant

Indicates whether or not the student was previously included in the count of secondary STEM Starter Academy participants reported by your college (spring, summer, or fall of 2014, or spring of 2015), but not previously reported as a primary participant.

Data Type: Numeric **Length** Minimum 1 Maximum 1 **Format Example** 1

Code Descriptions

1 Yes
2 No
3 Unknown

Definition

Was the student previously included in the count of secondary STEM Starter Academy participants reported by your college (spring, summer, or fall of 2014, or spring 2015), but not previously reported as a primary participant?

Instructions

Business Rules	Dependency
Mandatory	Must be one of the values above

STM010 Developmental Math Intervention Participant

Indicates whether or not the student participated in a STEM Starter Academy-sponsored developmental math intervention (e.g., developmental math course, non-credit workshop) during the current reporting period (summer, 2015).

Data Type: Numeric **Length** Minimum 1 Maximum 1 **Format Example** 1

Code Descriptions

Y Yes
N No

Definition

Did the student participate in a STEM Starter Academy-sponsored developmental math intervention (e.g., developmental math course, non-credit workshop) during the current reporting period (summer, 2015)?

Instructions

Business Rules	Dependency
Mandatory	Must be one of the values above

STM011 Developmental Math Completer

Indicates whether or not the student participated in a STEM Starter Academy-sponsored developmental math intervention (e.g., developmental math course, non-credit workshop) during the current reporting period (summer, 2015), and fulfilled all developmental math requirements for your institution by the end of the current reporting period (summer, 2015).

Data Type: Numeric **Length** Minimum 1 Maximum 1 **Format Example** 1

Code Descriptions

Y Yes
N No

Definition

Did the student participate in one or more STEM Starter Academy-sponsored developmental math interventions (e.g., developmental math course, non-credit workshop) during the current reporting period (summer, 2015), and fulfill all developmental math requirements for your institution by the end of the current reporting period (summer, 2015)?

A student who has fulfilled all developmental math requirements for your institution is eligible to participate in degree-credit-bearing math courses.

Instructions

Business Rules	Dependency
Mandatory	Must be one of the values above

College Level Data	
Name of your Community College:	

Secondary STEM Starter Academy Activities/Events and Participants:	
Secondary events/activities target potential students who are not currently enrolled at a community college.	
How many TOTAL secondary STEM Starter Academy grant supported events/activities were held [e.g., recruiting at local high schools or community centers, organized campus programs or recruiting visits] from the end of spring term, 2015 to the beginning of fall term, 2015?	
How many TOTAL participants took part in secondary STEM Starter Academy events/activities from the end of spring term, 2015 to the beginning of fall term, 2015?	

STEM Starter Academy
Year Two Evaluation Planning
12/22/2014

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Note: This document presents changes to the original scope of work (that resulted from 9c cuts). Changes to the scope of work have been discussed by DHE and UMDI.

Introduction
Following is a preliminary scope of evaluation and technical assistance to be provided by the University of Massachusetts Donahue Institute (UMDI) during year two of DHE's STEM Starter Academy (SSA) program. The program's components and implementation plan for year two, and therefore plans for evaluation, are emergent. Substantial changes to the plan presented in this document may be necessary to accommodate adjustments to program and/or evaluation priorities and resources, subject to agreement between UMDI and DHE. The services described in this year two evaluation planning proposal are complementary to, and not in place of, ongoing year one activities, which are described below.

This work plan focuses on externally visible activities such as instrument development, data collection, and deliverables, but not on internal activities such as methodological planning, database development, data analysis, and project management. Evaluation questions and criteria, data collection methods and schedules, and reporting structures require further development and specification, and will be adjusted as our understanding of the STEM Starter Academy program evolves.

Purpose
The STEM Starter Academy evaluation has multiple purposes:

1. **Provide formative feedback.** UMDI will collect feedback from STEM Starter Academy program sites through surveys, interviews, site visits, focus groups, and concise structured reports.
2. **Provide preliminary summative feedback.** UMDI will collect and analyze baseline student performance data (e.g., number of students served, retention rates, dropout rates, graduation rates, credit accumulation, and course performance) to the extent feasible given time and resource limitations. Future evaluation activities (if funded) will shift from monitoring student participation and activity to other outcomes of interest (e.g., certificate or degree completion, transfer to a 4-year institution) that cannot reasonably be obtained within this study period.
3. **Provide technical assistance**. Technical assistance activities may include participation in key meetings, solicitation of expert reviews/commentary, refinement of documents describing best practices for advancing STEM education at community colleges, response to site specific

inquiries or requests for support, and brief interviews with community college representatives.

Goals for Year Two Evaluation
As the STEM Starter Academy program progresses through its second year of operation, the goals of the evaluation will be to:

- Document variations in both the progress and nature of implementation across sites, and reasons for those variations.
- Support project improvement through timely formative analysis and feedback.
- Identify and measure interim and final project outcomes.

Although direct attribution to SSA will be difficult to validate, the evaluation will seek to improve the stakeholders' understandings of the connection between program activities and changes in student outcomes.

Summary of Year One Evaluation Activities
To contextualize our year two evaluation plan, a brief summary of year one evaluation activities is provided below. This list includes some activities that are in process or that will be completed during fall 2014, and are funded through the year one SSA evaluation budget.

Year one data collection activities:
1. Spring 2014 – supplemental participant data collection
2. Spring 2014 – phone interviews with each campus
3. Summer 2014 – technical assistance meeting evaluation forms
4. Summer 2014 – supplemental participant data collection
5. Summer2014 – survey
6. Summer 2014 – selective site visits (5 sites)
7. Fall 2014 – year one reporting by sites

Other year one evaluation activities:
1. Technical assistance
    a. Meeting notes
    b. Intermittent reports and updates (e.g., summary of spring interview data)
2. Literature review – promising practices document
3. Annual report

Proposed Year Two Evaluation Activities
The budget and scope for year two of the SSA evaluation have not been established. This document includes proposed evaluation activities for year two. DHE and UMDI would like each campus to have a voice in the evaluation planning process (e.g., Are there data we can collect that could be particularly helpful or interesting to the sites?), and we welcome their feedback. An evaluation scope and budget will developed later this summer, as evaluation priorities are better understood and research activities are more fully specified.

Most sites are beginning to plan year two activities and programs now, and it is difficult to gauge the appropriateness of all proposed evaluation activities without having these plans in hand. To date, discussion surrounding SSA during year one has focused on recruitment and summer bridge programs. It seems likely that the focus during year two will shift to outcomes (retention, transfer, graduation, etc.). However, data on key outcomes for many participants will be delayed due to data availability timelines.

Below we present a proposed timeline for technical assistance and evaluation activities to be completed during year two. A brief description of each activity follows the table.

Timeline of Proposed Technical Assistance and Evaluation Activities August 2014 – September 2015														
Evaluation Activity	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**
Targeted technical assistance	X[1]	X[1]	X[1]	X[1]	X[1]	X	X	X	X	X	X	X	X	
Supplemental participant data collection	X[1]				X					X			X	
Grantee survey	X[1]												X	
~~Participant exit survey~~														
DHE interviews		X										X		
Grantee gathering feedback							X							
Phone interviews			X	X										
Site visits (Interviews, observation, focus group)			X	X								X	X	
Site reports					X[1]								X	
Illustrative case studies							X							
Interim evaluation report								X		~~X~~				
Annual evaluation report						X[1]								X

[1]Evaluation activity is included in the existing year one scope.

Targeted technical assistance[1] – UMDI will provide DHE with targeted technical assistance. For example, evaluators will attend DHE planning and review meetings. UMDI will respond to requests for information or support as feasible and appropriate. Technical assistance will average no more than 20 hours per month from January, 2015 through August, 2015.

Supplemental participant data collection – At the conclusion of each term (Fall 2014, Spring 2015, Summer 2015) participating sites will be asked to provide selected additional data that will aid in identifying participating students. These requests will likely include two primary components, one for 'primary' SSA participants, and one for 'secondary' SSA participants.

Grantee survey – At the end of the summer term, all participating sites will receive an invitation to complete an online survey designed to gather their feedback on the project as a whole and their assessment of project components specific to their site. Because the number of SSA sites is limited, programs are site specific, and responses to survey questions are intended to represent an institutional perspective, survey responses will not be confidential. The 2015 grantee survey will be substantially narrower in scope than the 2014 grantee survey. The survey will focus on topics that are of greatest interest to DHE, and will primarily be comprised of close-ended items.

DHE interviews – Interviews will be conducted with DHE personnel to gather feedback on SSA processes and outcomes.

[1] This does not include intensive site-specific evaluation assistance.

Grantee gathering feedback – UMDI will gather feedback from participants at formal technical assistance gatherings.

Phone interviews – One-hour phone interviews will be conducted with 10 sites in the fall of 2014 to gather feedback about relevant topics (e.g., successes, challenges, next steps).

Site visits – Site visits will be conducted to develop a solid foundation for understanding the SSA programs being offered at each site, and to gather information about promising programs and practices. UMDI will visit 5 sites during the fall of 2014 (those not interviewed by phone), and 5 sites during summer 2015. Site visits will (typically) include three primary data collection activities: interviews with key program administrators and staff, observation of program activities, and brief focus groups with program participants. The duration of site visits may vary, but will typically last about 4 hours. UMDI will work with each site to set an appropriate schedule for each visit.

Site reports – Near the end of each SSA funding cycle (December 2014 and August 2015), each site will be asked to complete a report summarizing their SSA activities, impacts, and outcomes. UMDI will assist DHE in developing a template for these reports. Because the year one report will be submitted at the end of fall 2014, this report may include items which ask sites to describe their plans for spring and summer 2015. Individual site reports will be packaged as a standalone report. Information included in these reports will also be summarized by UMDI, and included in year-end evaluation reports (as feasible and appropriate).

Illustrative case studies – Data collected through observations, interviews, and student focus groups during summer and fall 2014 will be used to generate 2 brief case studies that present students' experiences in SSA programs. These case studies may incorporate the voices of system officials who supported or affected their path from interested, to engaged, to completion. The case studies are intended to contribute to our understanding of emergent program designs, and how SSA programs work (and perhaps struggle) to advance SSA goals (e.g., student enrollment and success in STEM fields).

Interim evaluation report – Highlights from Year 1 Site Reports and the February grantee gathering that have the potential to inform project development, implementation, and/or mid-course correction will be summarized into a briefing memo, which will be presented to DHE and each participating campus. A more complete thematic analysis of relevant data sources will be included in the annual evaluation report.

Annual evaluation report – An annual report will summarize and integrate the findings of data collection throughout the year. It will include formative feedback on implementation, promising practices, and lessons learned, as well as summative findings on progress toward targeted outcomes. The year two annual report will be submitted by September 30, 2015.

Interview Protocol for SSA Coordinators and/or Administrators – Fall 2014 (1 hour)

General Information

Interviewee: **Position:**

Community College: **Date/Time:**

Phone Number:

Introduction [5 minutes]

- Thank you for taking the time to speak with me today. The purpose of this interview is to learn more about your institution's SSA programming and activities *this fall* and how you are applying what you've learned through SSA so far as you plan for the future.
- Just to confirm: we're scheduled from ____ to ____ today – does that still work for you?
- As with our interviews this spring, we will be sharing the findings from this interview with interested parties, including the Massachusetts Department of Higher Education (or DHE), and possibly other higher education institutions. Since there are a limited number of SSA sites, we will be unable to report information about your program in a completely confidential manner. However, in the event that you would prefer for a particular response to remain confidential, please let me know, and I will honor your preference for confidentiality.
- I want to let you know that I may need to interrupt from time to time to cover an additional topic during our limited time together, or to follow up on aspects of your comments that fill important gaps in our knowledge.
- (Ask for permission to use recorder before starting the recorder and after.)

INTERVIEW QUESTIONS

Interviewer overview [5 minutes]

1. My understanding is that your college is engaging in (or has engaged in) the following activities funded by the SSA grant.

   Pre-interview summary (Site-specific notes from summer site visit, fall survey, or supplemental data requests)

   _____

   _____

   _____

   _____

   _____

   _____

General questions about fall SSA activities [30 minutes]

2. Can you give me a brief overview of your community college's SSA activities this fall?
   - Probes:
     - Who are the students that are the focus of your SSA programming and activities this fall?
     - How, if at all, do your SSA activities support students' social needs (e.g. feeling a sense of belonging or balancing school, work, and family)?
     - How do your SSA activities support students' academic needs?
     - Are you offering any financial assistance to students through SSA this fall? Please describe.

3. Tell me about what is happening with students who have already been served by SSA [if not discussed above].
   Probes
   a. How did your SSA program remain engaged with students in the transition from summer to fall (if at all)?
   Are they still receiving SSA services or are they eligible to receive SSA specific services? What does that look like?
   Are these students being tracked in some way? How?

4. Is your institution engaging in any efforts to align STEM curricula with industry needs? Please tell me about them.

5. How did you decide on the activities and practices you are using with SSA this fall?
   - Probes:
     - What were the goals that guided your choices?
     - What resources did you draw upon to choose and design those practices and activities?

6. To date this fall, which of your institution's SSA practices or activities are emerging as the most successful or most promising? Please explain. What factors have facilitated those successes?

7. Given your goals for this fall, what are the indicators you might look for as signs of progress toward those goals? How are you (or will you) measuring or monitoring these indicators?

8. What challenges are you facing in implementing or coordinating SSA programs and activities this fall, and what strategies are you using to address those challenges?

9. Are there additional supports that you believe would make your programming more successful? [Probe for any of the following that aren't mentioned.]
   - Probes:
     - Support from your College?
     - Support from your DHE?

10. Did you or will you participate in any of the working groups David has organized? Why or why not? What are your thoughts about the importance of this kind of "Best Practice Exchange" – as it was originally conceived in the community colleges' proposal – to the success of the SSA initiative as a whole?

In this next set of questions, I'll ask a little about what you have planned for your SSA program: [15 minutes]

11. Looking ahead, what do you see as the key next steps for the effective implementation of SSA programs and activities at your institution?

12. What are your plans (or current activities) for recruiting new participants? Do you anticipate having a larger cohort this time around?

13. What did you learn about recruitment, student support, or programming last year that has changed what you are doing (or planning to do) this year?

14. Does your college envision SSA programming continuing beyond the funding period?

    - Probes:
      - What steps, if any, has the college taken toward being able to sustain SSA services beyond the funding period?
      - Are there program components you anticipate being difficult to sustain? Why?

- [*If respondents do not seem to have first-hand knowledge about sustainability issues*] If we want to make a follow-up contact to someone in your college who would have more specific knowledge about sustainability issues, can you recommend whom we should contact?

[IF TIME] Finally, I have a couple questions I'd like to ask about within- and between-campus collaborations and programmatic synergies. [5 minutes]

15. [If time] Do your SSA activities build on relationships or learning from other grant-supported programs (e.g. dual-enrollment, developmental math, Complete College America, Guided Pathways to Success)? If so, please describe the relationships between SSA and those programs and what you are learning or have learned.

16. [If time] How did your collaboration with other campus systems or offices impact your SSA implementation, if at all?

    - Probe:
      - What impact, if any, is SSA having on other campus systems such as advising, financial aid, retention supports, and transfer systems?

17. I would like to avoid keeping you for any longer than we agreed. That being said, is there anything else you would like to add about the SSA implementation in general or about this evaluation process?

Thank you for taking the time to talk with me today.

SSA Site Visit: Student Interview or Focus Group Questions – Year 2, Fall 2014

Welcome: Thank you for coming to this focus group today. I know you are all busy and your time here is very much appreciated.

Evaluator's Introduction: I work for the UMass Donahue Institute – I'm an external evaluator who has been hired by the Department of Higher Education to help evaluate the STEM Starter Academy Initiative (which I will refer to as SSA). My goal is to get your feedback on SSA programs.

Explanation of focus group: I would like to hear from as many as you as possible. Don't feel like you have to answer all the questions, but do participate to the extent you are comfortable. It's okay to respond to one another, and it's okay to agree or disagree with one another. It is very likely that you have different experiences. The point here is to get as much of a complete story about SSA – from your unique perspective – as is possible.

Confidentiality: I will include a summary of this discussion in reports I write later this fall and winter. I won't use your names and will not identify you specifically. For example, I might say something like, "one student identified one-on-one tutoring as a major facilitator of learning."

Also, please respect people's privacy once we leave this group. During the group, we may mention faculty and other SSA students by name (their privacy will also be preserved in the report). Our discussion is confidential. Is that clear?

Recording: I will be recording the discussion because it would be impossible for me to accurately write the whole the thing down. I will be transcribing the recording, and one or two of my colleagues will also review the transcript. No other people will hear or see the whole discussion. Does everyone here agree to be recorded?

I will turn on the recorder now and let's start.

I am here with…. This is just a reminder that this conversation is being recorded.

Questions:

1. Tell me a little bit about how you got connected with SSA – for example, did you participate in summer programming, did you take a workshop or boot camp, or did you receive some other sort of support?
    a. What convinced you to participate?
2. How are you staying involved with STEM Starter Academy, if at all? Why do you stay involved?
3. What are the ways that being a part of SSA has helped you this fall?
4. What are the best things about the STEM Starter Academy program? Can you give me an example?
5. What do you find the most difficult about the SSA program? Can you give me an example?
6. If you were in charge of this program, what would you change about it? Is there some kind of support that would make your experience better?
7. Has being involved with SSA changed your ideas about your major here at this community college?
8. Has being involved with SSA changed your ideas about what you'll do when you finish here?
9. What kinds of students are the best fit for the SSA program here? Why?
10. Is there anything else you'd like to share about the SSA program at your campus?

STEM Starter Academy – Selected site visits – Year 2
Observation Protocol – Fall 2014

Cover Page – To Be Completed Before Observation

General information:

College _____ Date _____

Activities observed (*more than one might be observed simultaneously*):

- ☐ STEM credit courses
- ☐ Boot camps or prep workshops
- ☐ Interest workshops
- ☐ Self-paced/computer-aided classes
- ☐ Cohort activities
- ☐ Students receiving support services
- ☐ Peer mentoring
- ☐ Study groups
- ☐ Enrichment activities (list)
- ☐ Research experiences
- ☐ Internships
- ☐ Online advising or mentoring systems
- ☐ Dual enrollment courses
- ☐ Other:

Observation length (minutes):

Pre-Observation Summary

- Brief description of SSA program at this school.
- Specifics related to:
  - Staffing structure –
  - Student selection/participation –
  - Scheduling –
  - Logistics –
  - Student populations –
  - Policies and procedures –
  - Use of software, online resources or tools –
  - Partnerships with community agencies and/or local industry –
- Specific things to look for during the observation:

STEM Starter Academy – Selected Site Visits – Year 2
Observation Protocol – Fall 2014

Notes:

- The goals of this observation are to:
  - obtain a general sense of the scope and quality of SSA program implementation at sites that represent a variety of activities designed to address the goals of the SSA initiative; and
  - identify program aspects that offer illustrative examples of the impact of SSA on students.

General

- Briefly summarize the observation in general.
  - What activities were observed (identified on page 1)? For how long was each type of activity observed?
  - What was the purpose of the event being observed?
  - How many people were involved?
    - # of students _____
      - Characteristics (if available) such as grade levels, demographics, etc.?
    - # of staff/administrators _____
      - What were the roles of the staff/administrators observed (e.g. instructor, tutor, advisor, mentor, coach, speaker, administrator, etc.?)
  - In general, what was the level of engagement of the people involved?
  - What was unique and/or particularly interesting about what was observed?
  - What was observed that would be helpful to others who wanted to create a similar program?
  - Did your observations give you any insight into program sustainability? Describe.

Program Dimensions

Describe observations related to the following program dimensions:

- Staffing structure used –
- Curriculum –
- Student participation –
- Student support services offered –
- Advising model/structure used –
- Program scheduling –
- Program logistics –

- Policies and procedures –
- Partnerships with local industry and community agencies –

Activities and Support

- In what ways does the SSA program provide:
    - A specific or targeted emphasis on college readiness?
    - A specific or targeted emphasis on STEM career awareness?
    - A specific or targeted emphasis on options for completion (transfer to 4-year colleges, career paths available with 2-year degree)?
- What learning activities are observed?
    - What pedagogical strategies are used?
    - Describe participants' engagement in the activities.
    - Approximately how many students/staff are in attendance?
- What enrichment or retention-related activities are observed?
    - Describe the activities
    - Approximately how many students/staff are in attendance?
    - Describe participants' engagement in the activities.
- What recruitment activities are observed?
    - Describe the activities
    - Approximately how many students/staff are in attendance?
    - Describe participants' engagement in the activities.
- What student supports are observed?
    - Describe the activities
    - Approximately how many students/staff are in attendance
    - Describe participants' engagement in the activities
- Resources and support
    - What physical resources are available to students? (e.g., technology, space)
    - What student supports (academic, social, emotional, etc.) are available to students?
- Any issues which suggest student/teacher/administrator successes, challenges, desires, etc.?

Follow-up

- Are there specific things you had hoped to observe but didn't have the opportunity?

- Does this observation leave you with follow up questions? If so, list here:

- Based on this observation, are there specific things we should request to observe at a later date?

Summer 2015 STEM Starter Academy Site Visit Administrator Interview Protocol (1 hour)

Final 6/24/2015

General Information

Interviewee: Position:

Community College: Date/Time:

Pre-interview summary

(Based on previous data: Year 1 site reports, Fall/Winter (Y2) interviews, survey data, and Spring (Y1) interviews)

Brief description of SSA implementation at this site:

Key programmatic elements of implementation strategy at this school:

- Target populations and strategies for recruiting under-represented groups -
- Summer bridge program -
- Academic year programming and support -
- Experiential learning opportunities -
- Career exploration activities and support -
- Support for transition to 4-year institution -
- Faculty professional development -
- Cohort model? -
- Other -

Key successes:

Key challenges:

Unique features:

Site-specific follow-up questions:

Introduction [5 minutes]

- Thank you for taking the time to speak with me today.
- This interview will focus on your Year-Two SSA activities. The purposes of this interview are
    - to capture your reflections on the successes and challenges of implementing SSA programming and activities at your institution this past year,
    - to learn about your site's spring and summer SSA activities, and
    - to get a bigger picture view of the main elements that make up SSA at your institution.
- We will share findings from this interview with interested parties, including the Massachusetts Department of Higher Education (or DHE), other higher education institutions, and other relevant stakeholders. Since there are a limited number of SSA sites, we will be unable to report information about your program in a completely confidential manner. However, in the event that you would prefer for a particular response to remain confidential, please let me know, and I will not report on it publicly.
- Ask for permission to record the interview.

INTERVIEW QUESTIONS

Interviewer overview [5 minutes]

1. In our interview with you this past fall [or winter], we learned about your site's fall SSA programming. I would like to briefly recap our understanding of those activities. Then, I'll ask you about your institution's SSA activities this past spring and during the current summer. Please interrupt me to fill in details or make corrections.

   Key features to address in this recap:
   - Fall activities or services for *continuing* SSA students (Students who had started with SSA before Fall)
   - Fall activities or services for *new* SSA students [new to SSA program(s)]
   - Successes or challenges from the fall
   - Lessons learned or changes made to activities

_____
_____
_____

   a. Am I missing anything? Or, are there things I need to adjust?

Reflections on Spring 2015 [10 minutes]

2. Let's move on to this past spring. My understanding is that your site was engaged in the following activities as part of SSA this spring (briefly summarize here):

_____
_____
_____

   a. Am I missing anything?
   b. In what ways were your SSA initiatives a success this past spring? How did you know they were successful?
   c. Could you share a story or example of a student experience from the spring that highlights your successes?
   d. What factors facilitated these successes?

3. Last year you reported the following challenges with implementing SSA in the spring:

_____
_____
_____

   a. In what ways were your challenges this spring different, if at all? (Did you face the same challenges again? Have the challenges from last spring been resolved? What new challenges did you face and how did you address them?)

4. What populations did your site focus on for recruiting this year?
    a. Why did your site choose to focus on those populations?
    b. How did your site target recruitment to those populations?
    c. (If not previously covered) Did your site recruit students from populations underrepresented in STEM? If so, which populations did your site target for recruitment, and what strategies did your site use to recruit them?

Summer 2015 activities [10 minutes]

5. Now, let's talk about the summer SSA activities at your site. Here is my current understanding of the SSA activities happening here this summer:

_____
_____
_____

    a. Am I missing anything?

6. Could you describe any notable successes with SSA so far this summer? How do you know these are successes?
    a. Could you share a story or example of a student experience from this summer that highlights your successes?
    b. What factors facilitated these successes?

7. Last year, your site reported the following challenges with SSA implementation during the summer:

_____
_____

    a. In what ways are your challenges this summer different, if at all? (Are you facing the same challenges again? Have challenges from last summer been resolved? What new challenges are you facing and how do you plan to address these challenges?)

General SSA Program Questions [15 minutes]

Now I have some questions related to your SSA program more generally.

8. Last year, I understand that your site [accepted all applicants/selected applicants based on the following criteria:]

_____
_____

    a. How did your site select SSA participants this year from among those who applied?
    b. What do you see as the characteristics of students who are most and least successful in your SSA programs?
    c. Have your site's SSA activities had any unintended positive outcomes or negative consequences for students? Please describe.

9. In what ways and to what extent is your site tracking students (primary participants) who participated in SSA last year (spring, summer or fall)? What do you know about how or what those students are doing?
    a. In what ways and to what extent is your site intentionally or systematically *engaging* these past SSA participants in continued STEM or other academic support activities? Please describe.

10. DHE is particularly interested in knowing how SSA is creating a pipeline to entry into the STEM workforce (in fields such as advanced manufacturing, nursing, IT, etc.) – what can you tell me about how SSA is supporting that pipeline here? How do you know what is working?

11. As you know, sustainability is one of the key focuses of the SSA initiative at this stage. My understanding is that your site is pursuing the following options in the interest of sustainability:

_____
_____

a. What, if anything, has changed in the way your site is thinking about or planning for the sustainability of SSA? Have you made any progress on any of those fronts?
b. We have heard from campuses that financial incentives like stipends are important pieces of SSA that will be difficult to sustain. Given this situation, we'd like to know how your institution sees stipends fitting into a broader SSA model that could be sustained beyond the period of grant funding. Are stipends a core part of your program that you will seek external or other funding to maintain? Or, are they not a core element such that you plan to phase out or reduce these incentives when SSA funding ends?

12. We know that there are several other initiatives that overlap with SSA, such as Guided Pathways to Success and the TAACCCT4 grant. Can you tell me about the *relationship* between SSA and these other initiatives at your institution?

Closing Reflections [10 minutes]

13. Now that your site has been running SSA activities for about a year and a half, what elements are emerging as the key or main components of your institution's SSA programs?
    a. Is there any common experience among the students who participate in the various aspects of your institution's SSA program(s)? Please describe.
    b. What is the message you share with stakeholders about what SSA *is* at your site?

14. Have you had any interaction(s) with DHE around the work funded by your SSA award? Please describe. How has DHE supported your work? How has this been helpful or not, and what additional help would be useful?

15. [If time] Does your site have measurement priorities or plans beyond what DHE and UMDI are measuring at the initiative level?
    a. Are there aspects of program implementation are you not formally tracking, but think are important? Which ones?
    b. If you had to say whether or not SSA was working for any given student, what indicators or outcomes would you look for?

[Only if time] About Observation [5 minutes]

16. *Ask these questions if the interviewee is familiar with the activities (to be) observed during the visit.*

If interview takes place prior to observation:

Today, we plan to observe SSA in action. What specifically will we be observing?

a. To help us understand the program and share its promising practices with DHE and other sites, what do you think are some of the most important things we should be looking for during our observation?
b. Are there major components of your SSA program that we will not observe, or that are difficult to observe but important to understand?

If interview takes place after observation and interviewee was present or is familiar with the activity:

Today, we observed SSA in action here. [*Briefly describe observation*.]

a. To help us understand the program and share its promising practices with DHE and other sites, what do you think were some of the most important things we saw during our observation?
b. Are there additional major components of your SSA program that we did not observe but that you think are important for us to understand?

Thank you for your time.

SSA Site Visit: Student Interview or Focus Group Questions – Year 2, Summer 2015

Welcome: Thank you for coming to this focus group today. I know you are all busy and your time here is very much appreciated.

Evaluator's Introduction: I work for the UMass Donahue Institute – We are external evaluators who have been hired by the Department of Higher Education to help evaluate the STEM Starter Academy Initiative (which I will refer to as SSA). My goal is to get your feedback on SSA programs.

Explanation of focus group: I would like to hear from as many as you as possible. Don't feel like you have to answer all the questions, but do participate to the extent you are comfortable. It's okay to respond to one another, and it's okay to agree or disagree with one another. It is very likely that you have different experiences. The point here is to get as much of a complete story about SSA – from your unique perspective – as is possible.

Confidentiality: I will include a summary of this discussion in reports I write later this fall and winter. I won't use your names and will not identify you specifically, but I might quote you anonymously. For example, I might write something like, "one student found tutoring to be very helpful. She said, 'sometimes I just need a little bit of help when I'm really stuck. After that, I can usually figure it out.'"

Also, please respect people's privacy once we leave this group. During the group, we may mention faculty and other SSA students by name (their privacy will also be preserved in the report). Our discussion is confidential. Is that clear?

Recording: I will be recording the discussion because it would be impossible for me to accurately write the whole the thing down. I will be transcribing the recording, and one or two of my colleagues will also review the transcript. No other people will hear or see the whole discussion. Does everyone here agree to be recorded?

I will turn on the recorder now and let's start.

I am here with…. This is just a reminder that this conversation is being recorded.

Questions:

1. Let's first go around the room quickly [depending on group size]: tell me if you're participating in a STEM Starter Academy program now or if you have participated in the past, and which programs/activities you participated in.
2. How did you hear about SSA? What are some reasons you decided to participate in SSA?
3. What are the ways that being a part of SSA has helped you this summer?
    a. How do you think your college experience would be different if you had not participated in SSA?
4. What are the best things about the STEM Starter Academy program? Can you give me an example?
5. What do you find the most difficult about the SSA program? Can you give me an example?
6. I'm interested in knowing if participating in SSA changed any of your ideas about STEM:
    a. Did any of you switch into or switch between STEM majors because of SSA? Has being involved with SSA changed your ideas about STEM majors?
    b. Are any of you considering different job or career possibilities than you were before you participated in SSA? Tell me about that.
    c. What about what you'll do when you graduate from here – how has SSA helped you think about what's next?
    d. How has SSA shaped other parts of your college experience?
7. Do people who participate in SSA know each other here? Do you do anything together (e.g., study, have meetings, have classes, etc.)? In what ways is this helpful or not?
8. Some of you might feel that SSA is a good fit for you and some might think it isn't as good a fit – I'm interested in knowing why.
    a. First, for those of you who feel that SSA *is* a good fit for you – can you tell me why?
    b. For those of you who feel like SSA has *not* been a good fit for you – can you tell me why?
9. If you were in charge of this program, what would you change about it? Is there some kind of support that would make your experience better?
10. If you were going to tell one of your friends about the STEM Starter Academy program here – how would you describe it?
11. Is there anything else you think we should know about the STEM Starter Academy program here?

STEM Starter Academy – Selected site visits – Year 2

Observation Protocol – Summer 2015

Cover Page – To Be Completed Before Observation

General information:

College _____ Date _____

Activities observed (*more than one might be observed simultaneously*):

- ☐ STEM credit courses
- ☐ Non-credit or student success courses
- ☐ Boot camps or prep workshops
- ☐ Interest workshops or activities
- ☐ Self-paced/computer-aided classes
- ☐ Cohort activities
- ☐ Students receiving support services
- ☐ Peer mentoring
- ☐ Study groups
- ☐ Enrichment activities (list)
- ☐ Research experiences
- ☐ Internships
- ☐ Online advising or mentoring systems
- ☐ Dual enrollment courses
- ☐ Faculty PD/meeting
- ☐ Other:

Pre-Observation Summary

- Brief description of SSA program at this site.

- Specifics related to SSA model elements:
    - Target populations/student selection –
    - Summer bridge program description –
        - Schedule
        - Elements
    - Experiential learning opportunities –
    - Career exploration activities and support –
        - Support for transition to industry/career
    - Support for transition to 4-year colleges –
    - Cohort model? Is there a common experience for SSA students at this institution?
    - Faculty professional development?
    - Academic-year programming and support –
        - STEM-specific intrusive advising
        - STEM tutoring
        - Financial support

- Specific things to look for during the observation:

STEM Starter Academy – Selected Site Visits – Year 2
Observation Protocol – Summer 2015

Notes:

- The goals of this observation are to:
  - Develop a deeper understanding of how SSA programs are impacting students
  - Gather the perspectives of campus stakeholders about SSA
  - Collect information about promising programs and practices
  - Capture the character and details of site-specific program implementation in order to offer illustrative examples of the impact of SSA on students in a way that is translatable to external project stakeholders

General

- Briefly summarize the observation in general.
  - What activities were observed (identified on page 1)? For how long was each type of activity observed?
  - What was the purpose of the event being observed?
  - How many people were involved?
    - # of students _____
      - Characteristics (if available) such as grade levels, demographics, etc.?
      - If time allows, ask instructor how many students should have been in attendance.
    - # of staff/administrators _____
      - What were the roles of the staff/administrators observed (e.g. instructor, tutor, advisor, mentor, coach, speaker, administrator, etc.?)
  - In general, what was the level of engagement of the people involved?
  - What was unique and/or particularly interesting about what was observed?
  - What was observed that would be helpful to others who wanted to create a similar program?
  - Did your observations give you any insight into program sustainability? Describe.

Program Dimensions

Describe your observations related to SSA Model elements:

- Target populations/student selection –
- Summer bridge program description –
  - Schedule
  - Elements
- Experiential learning opportunities (including research experiences, experiential curriculum design)
- Career exploration activities and support
  - Support for transition to industry/career
- Support for transition to 4-year colleges
- Cohort model? What is the common experience for SSA students at this institution?

  - Faculty professional development?
  - Academic-year programming and support
    - STEM-specific intrusive advising
    - STEM tutoring
    - Financial support
    - Other student support services

Activities and Support

- In what ways does this SSA program provide:
  - Specific or targeted support for student retention?
  - A specific or targeted emphasis on college readiness?
  - A specific or targeted emphasis on STEM career awareness?
  - A specific or targeted emphasis on options for completion (transfer to 4-year colleges, transfer to career with 2-year degree or certificate)?
- What learning activities are observed?
  - What pedagogical strategies are used?
  - Describe participants' engagement in the activities.
  - Approximately how many students/staff are in attendance?
- What enrichment or retention-related activities are observed?
  - Describe the activities
  - Approximately how many students/staff are in attendance?
  - Describe participants' engagement in the activities.
- What student supports are observed?
  - Describe the activities
  - Approximately how many students/staff are in attendance
  - Describe participants' engagement in the activities
- What other activities are observed?
  - Describe the activities
  - Approximately how many students/staff are in attendance
  - Describe participants' engagement in the activities
- Resources and support
  - What physical resources are available to students? (e.g., technology, space)

  - What student supports (academic, social, emotional, etc.) are available to students?

- Did you observe anything that suggests student/teacher/administrator successes, challenges, desires, etc.?

Follow-up

- Are there specific things you had hoped to observe but didn't have the opportunity?

- Does this observation leave you with follow up questions? If so, list here:

- Based on this observation, are there specific things we should request to observe at a later date?

STEM Starter Academy Summer Program Schedules 2015 (abridged)

Institution	Program Name	Start Date	End Date	Daily Schedule	Description	Intended Audience	Respondent
Berkshire	Math Spring Fling	5/12/2014	6/3/2015	Varies	Twelve hours of on-line math (6 on campus, 6 at home).	Incoming freshman members of SSA who are not college ready in math	Constance West
	BCC STEM 101	8/3/2015	8/7/2015	9 a.m.-3 p.m.	Bridge-to-college activities, industry guest speakers, and college success skills.	All incoming freshman members of SSA class of 2015	
	Math Workshop	8/10/2015	8/14/2015	9 a.m.-3 p.m.	Small group instruction, individualized computer work, and hands-on activities.	Incoming freshman members of SSA who are not college ready in math	
	STEM Explore	8/17/2015	8/20/2015	9 a.m.-3 p.m.	Hands-on STEM activities with college instructors.	All incoming freshman members of SSA class of 2015	
Bristol	BCC - Summer Bridge	6/15/2015	8/22/2015	M-R, 8 a.m.-12 p.m.	Students take three free courses: a college success seminar (CSS101), one math (either dev. math or college algebra), and one science course (either dev. chem or general biology). Program also includes a STEM activities on Thursdays.	Incoming freshman to the college who identified interest in a STEM field or current BCC students in General Studies with an interest in STEM. Can be traditional or non-traditional students.	Meghan Abella-Bowen
	BCC - Learning Communities	6/15/2015	8/22/2015	MW or TR , 4-7 p.m.	Students take two free courses: College Success Seminar (CSS101) & developmental math. Offered at three BCC campuses: Fall River, New Bedford, and Attleboro.	Incoming freshman and current BCC students with an interest in STEM and who need to take a developmental math course to get on track	
	BCC - STEM Boot Camp	8/24/2015	8/28/2015	M-F, 8:30 a.m.-4:30 p.m.	Daily, hands-on STEM workshops led by BCC Faculty. Proposed program includes med tech, biotech, environmental and marine tech, electrical engineering, mechanical engineering, and computer information systems.	Incoming students (with a focus on General Studies students)	
Bunker Hill	STEM Starter Academy	6/1/2015	7/23/2015	M-R, 9 a.m.-11:30 or 12 p.m.	Students take one of two free developmental math clusters (097/099 and 099/194).	Current BHCC students who placed into developmental math	Joye Thaller
		8/31/2015	9/2/2015	9 a.m.-2:30 p.m.	Special workshops on engineering and biotechnology.	Current BHCC students who participated in SSA math clusters	
Cape Cod	Summer of STEM Scholarship	5/26/2015	8/27/2015	Daily schedules depend on course program and current progress .	Students currently enrolled in a STEM program receive a scholarship for a mathematics or science course in their program. All students participate in one STEM workshop to support study skills, career decision making , and community building (either Aug 10 or 11, 2:30 to 4:30 p.m.).	Current community college STEM students	Jill Neumayer DePiper
	Summer Bridge	7/9/2015	8/27/2015	Daily schedules depend on math placement.	Students interested in a STEM program can receive a scholarship for a mathematics course in their program, as determined by a placement exam. Students must also participate in two STEM workshop meetings with other STEM students to support study skills, career decision making, and community building. (The first two will be offered Aug 10 and 11, 2:30 to 4:30 pm and two more will be scheduled to align with students coursework.)	Incoming STEM students, specifically students who have just graduated high school and who are beginning a STEM program at CCCC.	
Greenfield	STEM Starter Academy	7/14/2015		10 a.m.-1 p.m.	Orientation	Students who are new to college, mostly current high school students or recent graduates	Amanda Hyde
		7/15/2015	9/1/2015	T-Th, 5-8:25 p.m.	BIO 126 - Biology I		
		7/15/2015	9/1/2015	M-W, 9 a.m.-12:25 p.m.	BIO 104 - Natural History		
		7/15/2015	9/1/2015	M-R, 8-10:30 a.m.	SCI 141 - Cosmic Life Becomes You: Scientific Literacy for Today		
		7/15/2015	9/1/2015	TR, 9 a.m.-12 p.m.	MAT 095 - Introductory Algebra		
		7/15/2015	9/1/2015	M-R, 9-11 a.m.	MAT 096 - Intermediate Algebra		
		7/15/2015	9/1/2015	M-R, 1:30-3:30 p.m.	MAT 107 - College Algebra		
		7/15/2015	9/1/2015	TW, 9-11 a.m.	MAT 108 - Precalculus		
		TBD		12-1 p.m.	Summer workshop - Active reading and study strategies		
		TBD		12-1 p.m.	Summer workshop - Strategies for successful testing		
		TBD		12-1 p.m.	Summer workshop - Strategies for successful testing		
		TBD		12-1 p.m.	Summer workshop - Pursuing STEM careers I		
		TBD		12-1 p.m.	Summer workshop - Pursuing STEM careers II		
		TBD		12-1 p.m.	Summer workshop - Early Entrant Program & portability of GCC credits		
		TBD		12-1 p.m.	Weekly academic advising appointments		
Holyoke	STEM Starter Academy	7/6/2015	8/5/2015	M-W 8:30 a.m.-12 p.m. R 8:30 a.m.-1:30 p.m.	STEM Foundations - 4 credit lab science course; extended activities on Thursdays.	Recent high school graduates entering HCC in Fall 15; adult learners transitioning from ABE/TCC; some current community college students	Michele Snizek
	Pre-STEM Summer Class	7/7/2015	8/13/2015	Day: T-R, 9:15 a.m.-12:15 p.m. Eve: T-R, 5:30-8:30 p.m.	Pre-STEM summer Transition to College and Careers course.	Adult learners transitioning from Adult Basic Education (ABE) programs to Transition to College and Career (TCC) programs	Marie Troppe
	STEM Starter Academy	6/10/2015	7/11/2015	M-F 8:30 a.m.-2 p.m.	Morning math class, mid-day STEM enrichment & career coaching, afternoon math self-study time with tutor in math lab. Field trips on Friday.	Incoming Massasoit students who have applied and been accepted into the STEM Starter Academy	

STEM Starter Academy Summer Program Schedules 2015 (abridged)

Institution	Program Name	Start Date	End Date	Daily Schedule	Description	Intended Audience	Respondent
Massasoit	STEM Research Internships	5/26/2015	8/31/2015	M-F 9 a.m.- 4 p.m.	Interns work up to six hours per day, depending on the research project schedule. These students have applied and been accepted as paid interns.	Current CC STEM students, including but not limited to previous STEM Starter Academy students	Michael Bankson
MassBay	High School Summer Bridge College-Credit Classes	7/6/2015	7/17/2015	M-F 9 a.m.-3:30 p.m.	Transferable college credit Engineering Design course where students use SolidWorks 3D engineering design software to create a model and then see it come to life using 3D printing technology . Transferable college credit Digital Imaging course where students experiment with image creation and digital imaging technologies.	High school rising juniors and seniors and recently graduated seniors	Valerie Kapilow
	High School Summer Bridge Workshops	7/6/2015	7/17/2015	M-F 9 a.m.-3:30 p.m.	Four, 2.5-day workshops, including "Artbotics", "Coding with Scratch", "Mobile Apps with App Inventor", and "Coding with Raspberry Pi."	High school freshman, sophomores, juniors, seniors, and recently graduated seniors	
	Tour of MassBay Wellesley College Campus	7/7/2015		12:30 - 1:30 p.m.	For high school summer bridge students: Tour of the MassBay Wellesley Campus (including the Engineering, Biotech, Computer Science laboratories) by admissions staff.		
	Engineering Design Presentations	7/6/2015		12:30 - 1:30 p.m.	For high school summer bridge students: Demonstration/exhibition of work by MassBay summer Engineering Design course students.	High school freshman, sophomores, juniors, seniors, and recently graduated seniors; current community college students	
	MetroWest College Planning Center presentation	TBD 7/6-7/17/2015		12:30 - 1:30 p.m.	For high school summer bridge students: Director of MetroWest College Planning Center will introduce students to the new center, its services and resources.	High school freshman, sophomores, juniors, seniors, and recently graduated seniors	
	STEM Speakers	TBD 7/6-7/17/2015		12:30 - 1:30 p.m.	For high school summer bridge students: Invited speakers from industry (Engineering or Computer Science professionals) will speak about their career field, the projects on which they work, skills they use and related job opportunities for those with Associate Degrees.		
	STEM Division and STEM Career Information Session	7/8/2015		12:30-1:15 p.m.	Presentation on STEM Division programs and STEM Careers delivered by SSA Implementation Coordinator.		
	Strategies for Academic Success	7/15/2015		12:30 - 1:30 p.m.	Presentation on "Strategies for Academic Success" including study, test-taking and time-management skills delivered by Academic Achievement Center staff member.		
	Newton STEAM Expo	7/18/2015		1-4 p.m.	Two to four MassBay STEM students (in Engineering and Biotech) will be demonstrating their projects, research, and designs.	Broad community audience including elementary, middle, and high school students; recently graduated high school seniors; parents; adult learners; and current community college students	
	Framingham High School Web Design Presentation	6/1/2015		10:30 - 11:30 a.m.	MassBay web design students will present to Framingham High School students taking web design classes. Presentation will focus on MassBay coursework, internships, and career options related to web design and will include students' own work.	High school freshman, sophomores, juniors, and seniors	
	STEM division and STEM Career Information Session	6/25/2015, 7/23/2015		10:30- 11 a.m.	Presentation on STEM-division programs and STEM careers delivered by SSA Implementation Coordinator. Targeted to MassBay math students in MA 90 , 95 ,98 and Math 1-2-3 self-paced classes as well as pre-calculus, college algebra and calculus I students.	Community college students	
	STEM Mentor Program Student Meetings	ongoing throughout summer sessions I, II, III		Varies	Individual and small group meetings with students taking summer-term STEM classes to discuss the STEM Mentor Program, specifically the benefits to and expectations of mentees and the responsibilities and commitments required of participants.		
	STEM Starter Academy Bridge, Session I	7/27/2015	8/7/2015	M-F, 9 a.m.-1 p.m.	A free, two-week program exploring health & STEM fields. Students learn lab skills, develop critical thinking and college success skills, become familiar with MCC and its resources, connect with peer mentors, and gain insight into successful career outcomes.	Majority of summer program participants will be new MCC students and current MCC students (with fewer than 24 credits). They can also be dual-enrolled high school students or adult learners.	
	STEM Starter Academy Bridge, Session II	8/10/2015	8/21/2015	M-F, 9 a.m.-1 p.m.			
	STEM Starter Academy Math Booster	6/8/2015	6/30/2015	M-R, 10 a.m.-1 p.m.	Self-paced, intensive, free math program. Students, placed by diagnostic exam, are supported by a MCC math faculty member and two peer tutors throughout the process.		

STEM Starter Academy Summer Program Schedules 2015 (abridged)

Institution	Program Name	Start Date	End Date	Daily Schedule	Description	Intended Audience	Respondent
Middlesex	STEM Starter Academy Alternative Math Booster Route	6/8/2015	6/27/2015	Sa, 8-10 a.m.	Same as regular Math Booster but specifically designed for students who have full-time, weekday jobs. After a diagnostic exam, students are required to complete at least 30 hours in the software program (on their own schedule) as well as attend all three 2-hour Saturday classes. In class, students receive support from a MCC math faculty member and a peer tutor. The faculty member checks student progress on a weekly basis.	New and/or current MCC students who have full-time weekday working schedules.	Joyce Wang
	Peer Achievement Mentor Program	7/27/2015	8/7/2015	M-F, 9 a.m.-1 p.m.	STEM & health students are matched with Peer Achievement Mentors who are successful MCC students. Mentees of the program will gain a sense of belonging at MCC and have additional academic and social support through their mentors.	Summer bridge participants & current MCC students	
	TEAS Prep Workshops	6/1/2015	8/31/2015	Various days & times throughout summer	Academic support for the TEAS test and tutoring for various STEM & health classes during the Summer sessions. Provided in collaboration with the Academic Center for Enrichment.	Current MCC students	
	STEM & Health Tutoring	6/1/2015	8/31/2015				
	STEM & Health Summer Internships & REUs	6/1/2015	8/15/2015	25 hours/week	STEM & health students participate in innovative research at 4-year universities, build laboratory skills, and gain practical experience in the field.		
Mt. Wachusett	STEM Starter Academy	7/7/2015	8/20/2015	M-F, 9 a.m.-3 p.m.	Students take one or two free courses (MAT 096, MAT 162,BIO 113, BIO 199, CIS 127 and/or PSY 105); participate in STEM-industry field trips, spatial reasoning workshops, tutoring, and MWCC's Leadership Academy; and receive a stipend.	High school graduates matriculating at MWCC in Fall 2015 & current MWCC STEM majors	Christine Davis
North Shore	STEM Starter Academy: Dual Enrollment	7/6/2015	7/31/2015	TR, 9:30 a.m.-12:30 p.m.	EGS 101 - Intro to Engineering	Current high school students	Laura Rubin & Fred Miranda
		5/18/2015	6/26/2015	TR, 6-9:35 p.m.	BIO 108 - Body Health and Disease	High school & current community college students	
		7/6/2015	8/14/2015	MW, 9 a.m.- 12:20 p.m.	CPS 100 - Information Technology and Application	High school & current community college students	
		7/6/2015	8/14/2015	TR, 6-9:20 p.m.	MAT 151 - Precalculus I	High school & current community college students	
		7/6/2015	8/14/2015	T-R, 5:45-10 p.m.	BIO 104 - Anatomy and Physiology 2	High school & current community college students	
	STEM Career Days	6/2/2015, 6/4/2015		8:30 a.m.- 12 p.m.	Industry representatives from GE, Varian, Mblast, NASA, Fitbit, Cell Signaling come to campus to speak to students about STEM.	Current high school students	
	Orientation with the Dean	TBD-August			Orientations for STEM students coming into fall STEM programs. Meeting peer mentors, connecting with faculty and program administrators.	Incoming North Shore students	
	Math Bootcamp (potential)	TBD					
Northern Essex	Tutoring Center	5/13/2015	8/6/2015	Varies	STEM-subject academic support via scheduled walk-in tutoring.	Current community college students	Sharon McDermot
	App Inventor	6/9/2011	6/11/2015	9 a.m.-1 p.m.	A workshop using the AppInventor program, which allows students to create their own apps on Android phones. Macs will be used as routers.	Current Computer Information Systems students	
		6/15/2015	6/17/2015	9 a.m.-1 p.m.			
		6/22/2015	6/24/2015	9 a.m.-1 p.m.			
	Summer Calculus Boot Camp	6/15/2015	6/19/2015	9:15 a.m.-12:45 p.m.	STEM students will learn, practice, and argue the mathematical concepts in Calculus I & II.	Students coming from MAT140, MAT145 or those who have had challenges in Calculus I or II	
	STEM at NECC	8/10/2015	8/10/2015	9 a.m.-1 p.m.	Current lab sciences students will be available to speak to STEM-interested incoming students about available careers.	Incoming students with a STEM interest	
	Peer Mentoring	5/13/2015	8/6/2015	Varies	STEM program students will meet with peers to ensure retention in STEM classes.	Current STEM program students	
Quinsigamond	STEAM AHEAD Summer Bridge-Main Campus	6/15/2015	6/26/2015	8:30 a.m.-3/4 p.m.	Pre-orientation program offering a variety of STEM non-credit classes and workshops, corporate site visits, a math boot camp, a study skills workshop, arts, writing, etc.	Accepted Fall 2015 QCC students (primarily high school graduates)	Darcy Carlson, Kathy Rentsch, Leslie Horton
	STEAM AHEAD Summer Bridge-Southbridge Campus	8/10/2015	8/21/2015	8:30 a.m.-3 p.m. (five days); 8:30 a.m.-12 p.m. (five days)			
Roxbury	Summer STEM Academy	7/6/2015	8/7/2015	M-F, 8 a.m.-5 p.m.	Participation in RoxMAPP (Roxbury Massachusetts Academic Polytech Pathway): Biology (Mon), Chemistry (Tue), Math (Wed), Phys (Thur), Field Trips (Fri)	High school students	Cecile Regner
	Math Boot Camp	7/6/2015	8/7/2015	M-F, 8 a.m.-5 p.m.	Intensive preparation in mathematics to improve Accuplacer scores.	Adult learners, current RCC students	
Springfield Technical	STEM Starter Academy	6/29/2015	8/7/2015	M-F, 8 a.m.-3:30 p.m.	Students will take two credit-bearing courses, one math and one college success seminar. They will also participate in a non-credit "STEM Rotations" seminar with lectures and hands-on activities led by STEM professors. Students will have access to tutor-run study halls and coaching. Each Friday, there will be a series of activities, including speakers and field trips. There will be end-of-summer student presentations and a closing ceremony.	Recently graduated high school students/newly accepted first-year community college students	Felicia Griffin-Fennell, Ph.D.

STEM Starter Academy
Awardee Gathering Feedback Survey – March 30, 2015 - RESULTS

Your candid response to this confidential survey is appreciated.

Note that some questions may not apply to some participants. In these instances, please select "DK/NA" (don't know/not applicable). ***Please strive to write legibly!***

1. In what role are you participating in this gathering of STEM Starter Academy awardees? N=23

- O STEM Starter Academy Program Manager/Coordinator **[8/23, 34.8%]**
- O STEM Starter Academy College Administrator **[12/23, 52.2%]**
- O Other, please describe _____**[3/23, 13.0%]**

2. To what extent do you agree or disagree with the following statements regarding this gathering?

This gathering of STEM Starter Academy awardees…	Strongly Agree	Agree	Disagree	Strongly Disagree	DK/NA
Gave me valuable new ideas and perspectives	39%	61%	0%	0%	0%
Offered participants a positive learning environment	43%	57%	0%	0%	0%
Provided activities that helped me actively engage with the content	30%	65%	4%	0%	0%
Allowed sufficient opportunity ask questions	39%	52%	4%	0%	4%
Included sufficient time to network with other participants	17%	52%	30%	0%	0%
Was clear in its connection to STEM Starter Academy objectives	48%	43%	4%	0%	4%
Was helpful in facilitating my reflection on 'lessons learned' and 'promising practices' that have emerged from work being done at my site	43%	35%	9%	0%	13%
Provided an effective venue for participants to share 'lessons learned' and 'promising practices' that have emerged from their sites	43%	52%	4%	0%	0%
Spurred my thinking about revising our approach to and/or identifying implementation priorities	48%	48%	4%	0%	0%
Offered concrete and useful examples of how other sites are refining their STEM Starter Academy programming	57%	39%	0%	0%	4%
Provided a helpful opportunity to discuss and collaborate with others facing similar issues	22%	70%	9%	0%	0%
Will likely influence how I approach this work at my site	48%	43%	0%	0%	9%

3. What was most useful to you about this gathering?

- Hearing about how SSA was conceptualized and implemented on various campuses.
- The sharing – loved hearing what other campuses are doing.
- It was good to hear how other colleges approach SSA.
- Discussion!
- To hear what other colleges are implementing.
- Sharing what each campus thought SSA was and hearing about the activities completed.
- The collaboration of the group.
- It was good to hear what others are doing. Got some ideas around programming for math.
- What others are doing.
- The discussions.
- Staying together as group.
- I really liked that we all stayed in one group and did not break out into separate sessions.
- Opportunities to share and learn about different models and approaches.
- Hearing about the design of summer bridge.
- Hearing about funding/stipends.
- Discussing assessment.
- Developing thoughts about tailoring our on-campus tracking and evaluation.
- Sense of budget.
- New ideas about how to approach recruitment and bridge program.
- Cross-cutting topics (recruiting, dev math, sustainability).
- Getting ideas for improving/refining SSA initiatives.
- Refocusing goals/efforts of our SSA initiatives.
- Clarified cross-cutting goals across diverse statewide programs.
- David's facilitation of the meeting. He asked people to talk about their program elements and asked follow-up questions in a way that gave us a common understanding of of all our programs.
- Good central location.
- Table set up.

4. What are your key takeaways from this gathering? How will it affect your work?

- New or different strategies to incorporate in our SSA work plan.
- Made me think more broadly about how and what additional data our program will begin to capture.
- There is no one-size-fits-all. Difficult to agree on best practices.
- The math strategies.
- Ideas for future recruitment and tracking.
- Need to think about measures of success.
- Data reporting – need to identify common measures.
- SSA is dynamic and evolving.
- Concerns about how differently we are all defining "primary participants", "secondary participants", and "STEM Starter Academy" and how erroneously data bins are presented to the powers that be.
- Good ideas about how to tweak and improve our program.
- Better definition of STEM Starter.
- Broader understanding of what everyone did.
- Change my recruitment approach.
- Constructing a narrative of what SSA is and does.
- How other campuses are partnering with industry.
- How other campuses do STEM advising.

- The lack of definition of the purpose/goals of SSA at beginning of grant made for some inconsistencies of how money was used. This will likely force us to reflect and refocus our programs and targeted outcomes.
- Need for industry engagement.
- Need to track data as vigorously as we can, as students continue beyond STEM Starter.
- There are very different approaches to the SSA.
- Definitely view the importance of testing at college level math differently than most other CC.
- Will consider/contemplate sustainability and financial assistance/stipend.
- Ideas on data collection, Summer Bridge (if funded in FY16).

5. What are the outstanding questions with which you are leaving this gathering?

- Need for better definition of SSA purpose, goals, and measurement. My guess is that we will continue this discussion.
- How to pay for this when the funding ends.
- Will we be funded FY16.
- How can we improve consistency.
- How can we improve data collection.
- What components of SSA might we sustain should funding be cut?
- How shall we define success for SSA participants?
- What Jeremiah was talking about – we need to precisely define and agree upon what we are trying to do if we are to measure it.
- Will I have a job come September? I felt the way the conversation casually talked about how some people's positions would be affected if this grant were not renewed was more series than the tone in which it was discussed.
- Budget?
- What are our points of focus in terms of gathering data that assess success of our initiatives at our school.
- Long term work necessary to gather impact data is a major concern (e.g. feasibility).
- Questions related to four above.
- Consistency across all the community colleges. Very different approaches which could be problematic in trying to "sell" one model.
- Do we look at other ways to sustain this program?
- Industry connections

6. Please share any suggestions you have for how we can improve future gatherings.

- Some small group discussions may have been useful.
- Have recommendations to discuss or adopt/modify, "these are the suggested end points to define success."
- Have another meeting over the summer.
- More than 1 per year? An early planning and post-summer decompression.
- Small group discussion would have been helpful.
- It was good to hear from the large group, but smaller breakout sessions would have facilitated greater exchange of ideas in smaller group exchanges.
- More time for networking with other campuses.
- Have subgroup meetings/discussions for certain issues (e.g. summer bridges, recruitment, assessment, sustainability, etc.) to continue conversations in greater depth.
- Very effective, well-facilitated.
- N/A – well done.

SSA Grantee Phone Meetings Summary

SSA grantees participated in seven hour-long conference calls between January and September 2015. The purpose of these calls was to share learning across sites, begin to outline a more uniform "model" of SSA implementation across sites, and disseminate information about budgeting and other implementation logistics. SSA coordinators or administrators joined the calls, which were facilitated by David Cedrone through April and by Allison Scheff thereafter. The primary topics of these calls were FY16 budget information, SSA Year 3 planning, and discussions around SSA "model" elements and measurement. See the table below for a list of topics by meeting. Grantees also met in person once, on March 30, for an all-day "technical assistance" gathering (see SSA Grantee Gathering Feedback section in the main body of this report).

In addition to these eight all-site meetings, three SSA Working Groups (Measurement, Model, and Sustainability) began phone meetings in May, facilitated by Allison Scheff of DHE. The sustainability group discussed the sustainability of various elements of currently implemented SSA programs but decided to reconvene after a set of cross-campus "model" elements had been developed by the other two working groups. The Measurement and Model Working Groups focused on refining definitions, flagging elements as candidates for a cross-campus SSA "model," and strategies for measuring those elements. At a joint, in-person meeting in July 2015, the Measurement and Model groups, along with some campus representatives from offices of institutional research, reviewed and refined the emerging model elements and strategies for measuring them. Based on these various discussions, Allison Scheff drafted a "design document" that was sent to all sites for review and comment in early August.

UMDI evaluators participated in the Measurement Working Group meetings and observed the Model and Sustainability Working Group meetings. Our observations resulted in a few notable findings. First, we noted the value of Allison Scheff's strategic facilitation of the Model Working Group in helping that group make decisions. A key issue hindering the identification of "model elements" at the initial meeting was a lack of clarity around the level of specificity of those elements. A focus on specific practices led site representatives to worry about how much flexibility they would have in implementation. At the second meeting, as the group discussed SSA activities included in the UMDI Year 1 Evaluation Report, Allison decided which activities were "model elements" and which were "promising practices" (to be nested below model elements). Although these distinctions were not well defined, this form of facilitation allowed the group to move forward by keeping the discussion at a more general level, which created space for differentiation between sites.

UMDI's analysis of these meetings revealed that sites are not consistently defining the idea of a student "cohort." SSA grantees seem to use the term "cohort" to refer to both a socially-connected group and also to any group of students who started their participation in SSA at the same time, regardless of if they have any social connection.

Date	Topics Discussed	Notes
1-22-2015	• FY14 site reports • FY14 DHE report to the legislature on SSA • In-person "Implementation Meeting" planning	Sites provided feedback on topics for conversation at the meeting.
3-12-2015	• FY16 budget update • DHE Year 1 report on SSA and issues around measuring and describing success • March 30 "Technical Assistance" gathering • Discussion of advanced manufacturing	David notes that report was delayed in being released partly because of an internal review process.
3-30-2015	In-person "Technical Assistance" gathering	Extensive discussions of target

	• Recruiting methods and populations • Approaches to mathematics • Evaluation and measurement • Sustainability • Career preparation • Financial supports • Curriculum • Faculty professional development	populations for recruitment, measuring and defining a common SSA approach to mathematics interventions, and appropriate measures for evaluating and presenting a narrative about the initiative more broadly.
4-16-2015	• FY16 budget updates • Introducing Allison Scheff's new role in SSA • Follow-up to March 30 meeting • Planning for FY16 • Working group formation and activation	
5-16-2015	Measurement working group meeting • Defining primary and secondary participants • Campus priorities for data collection	
5-20-2015	Sustainability working group meeting • More and less sustainable elements; candidates for internal or external funding • Data needs to support sustainability of SSA • Group products and process	
5-20-2015	Model working group meeting • Definitions: STEM fields, purpose of SSA, target participants of SSA • Potential SSA model elements	
5-21-2015	• Budgeting FY14, FY15, FY16 with Sheila Tunney • Working groups updates: Measurement, Sustainability, and Model working groups. • Request for summer schedules • Year 3 planning materials and structure discussion	Aside from discussion of the actual instruments, the Year 3 planning discussion focused on defining "cohort."
5-29-2015	Model working group meeting • Populations • Review of activities captured in Year 1 evaluation report	
6-24-2015	Measurement working group meeting • Discussion of measurement based on draft "model" • Populations: high school students, dual enrollment students • Success metrics • Exit survey	
6-25-2015	• Summer program sharing and updates • Evaluation updates, including discussion of participant exit survey • Discussion of draft SSA model	Discussion of the draft SSA model focused on specifying target populations for SSA interventions.
7-29-2015	Joint Measurement-Model group meeting • Using model and measurement to plan for FY16 • Feedback from campus IR representatives • Defining SSA participants and impacts	

	• Measurement at the local level • Exit survey • Review of original legislative language • Target populations: high school students, dual enrollment students	
8-19-2015	• FY16 budget development: TRAIN grant • Summer program sharing and updates • Year 3 planning ($250k budget per campus), including "reverse engineering" document and further discussion of an exit interview • FY16 budgeting timelines	Allison sent an SSA "design document" to sites on 8/7, requesting feedback by 8/14 and asking that sites' FY16 budgets reflect the elements in that document.
9-18-2015	• Feedback on Year 3 plans & planning process • Distributing FY16 funding • Discussion of adding developmental mathematics metrics to SSA evaluation • Sharing summer successes or transition to fall • Fall retreat planning	