Interview Protocol for SSA Administrators (1 hour)

General Information

Interviewee_____ Position_____

Community College _____ Date/Time _____

Phone Number _____

Pre-interview summary

Description of SSA programming:

- Spring activities:
- Summer activities:
- Staff structure:
- Logistics:

Any site-specific questions to be incorporated into the protocol:

Introduction [5 minutes]

- Thank you for taking the time to speak with me today. The purpose of this interview is to learn more about how your institution is implementing programming supported by STEM Starter Academy grant funds.
- Just to confirm: we're scheduled from _____ today – does that still work for you?
- We will be sharing the findings from this interview with interested parties, such as the Massachusetts Department of Higher Education (or DHE), and possibly other institutions of higher education. 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 us know, and we 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. We have a lot of ground to cover and not a lot of time, so I apologize in advance if I have to move you along a few times.
- Also, please understand that there are no right or wrong answers to these questions. My top priority is to get a clear understanding of how the SSA funds are supporting programming at your site, and get a sense for how your institution in particular envisions implementing the SSA program.
- (Ask for permission to use recorder before starting the recorder and after.)

INTERVIEW QUESTIONS

I'll start by asking you some general questions about your SSA activities. Then, I'll ask about your institution's SSA activities related specifically to Awareness, Outreach, Recruiting, and Transition, which are DHE's focus for this spring, summer, and fall. Finally, I'll ask you about how your institution is implementing a few specific programmatic activities.

General questions about your SSA program [20 minutes]

1. Can you spend a minute or two giving me an overview of your role with the SSA programs and activities at your community college?

2. Can you provide a brief overview of your community college's planned SSA activities for this spring?
    - Probe: Have there been any significant changes between what was proposed for your SSA work and what you have ended up doing?
    - Probe: Has this work built on previous partnerships or programs?

3. How are SSA-affiliated programs being coordinated and managed administratively at your institution? What kinds of staffing resources are dedicated to SSA programs?

4. To date, what SSA activities do you feel have been most successful? Please explain. What factors have facilitated those successes?

5. What challenges are you facing in implementing or coordinating SSA programs and activities, and what strategies are you using to address those challenges?
    - Probe: Even though this has been an area of challenge, are there steps forward you have made within this process?

6. What do you see as the key next steps for the SSA programs and activities to be implemented effectively at your institution?

7. What is the primary focus of your institution's summer SSA activities (if any)?

8. Do you foresee any major obstacles to successfully continuing your work with the SSA? If so, please explain.

Now, let's turn to awareness, outreach, and recruiting [15 minutes]

9. Specifically in terms of awareness, outreach, and recruiting, what are the primary ways that you see SSA funding <u>filling gaps</u> or <u>building on strengths</u> in your existing STEM programming?
    - In STEM career and program exploration?
    - In academic programs?
    - In student support services/activities?
    - In program capacity?
    - In professional development, planning and infrastructure?

10. Who are the target populations for your outreach and recruiting activities?
    - (e.g. High school students? Current CC students? Adult learners? Veterans?)
    - Why have you chosen to focus on this/these group(s)? What methods are you using to target these groups?

11. What are the milestones or metrics you will look for as signs of success regarding awareness, outreach, and recruiting? How are you or will you measure or monitor these outcomes?

12. Have you identified best practices relevant to recruitment and outreach? What are those practices? How do you determine what are "best practices"?

Now, let's talk about transitions [15 minutes]

13. What student transitions will your institution be focusing on this summer and fall?

- (for example: high school to first year? First year to second year? Second year to program completion?)

14. Specifically in terms of summer and fall transitions: What are the primary ways that you see SSA funding filling gaps or building on strengths in your existing STEM programs?

15. What are the milestones or metrics you will look for as signs of success in terms of summer and fall transitions? How are you or will you measure or monitor these outcomes?

16. Have you identified best practices relevant to summer and fall transitions? What are those practices?

Now, I'd like to ask you about one (a few) specific SSA activity (activities) on which your institution might be working now and in the next phase of the project:

17. Are you mapping academic pathways that support retention and transfer in STEM fields as part of SSA? If so, how are you doing that? How are you making these pathways available to your students?
    - How are these SSA-supported activities related to other curriculum pathways initiatives in which your campus is participating? (e.g. Complete College America's Guided Pathways to Success project)
    - (e.g. standardized outline of associate degree program requirements, with appropriate course sequencing and tied to transfer requirements for popular destination schools.)

18. [If time] Are you mapping STEM career pathways as part of SSA? If so, how are you doing that? How are you making these pathways available to your students?

19. [if time and not already discussed] How are you supporting career exploration as part of your SSA activities?
    - Are you working with industry and alumni to enhance career exploration within your STEM Starter Academy program, if at all? If so, how? If not, why not?

20. [if time and not already discussed] If you reported that you are working with certain industry sectors, how are you incorporating these relationships with industry into your programing?
    - Are you linking your outreach/recruiting efforts with your focus on specific industries? If so, how? (e.g. do you discuss specific industries in your outreach materials/events)

21. [If time] Is there anything else you would like to add?

22. [if time] David is interested in fostering collaboration between the campuses. Is there any area of the SSA program on which you would be particularly interested in collaborating with others?

Closing notes

- Thank you for taking the time to talk with me.
- Notify participant that a survey is coming soon and we are available to answer questions about it.

UMASS DONAHUE INSTITUTE • APPLIED RESEARCH & PROGRAM EVALUATION

STEM Starter Academy

Interim Evaluation Report, June 2014

Report on Interviews with Community College SSA Administrators

Contents

Introduction

The Massachusetts Department of Higher Education (DHE) created the STEM Starter Academy (SSA) initiative with the goal of building a model for student success in community college Science, Technology, Engineering, and Math (STEM) programs. The initial award to the 15 Massachusetts public community colleges supports those colleges in their efforts to build upon, codify, and extend system-wide best practices that undergird student progress through and completion of STEM curricular pathways. The initial grant included funding and technical assistance from January through December of 2014.

The UMass Donahue Institute (UMDI) is conducting the STEM Starter Academy evaluation. This document reports on the data gathered from interviews with key program personnel at each community college during the spring of 2014. These interviews were the first of six evaluation activities planned for the first year of the grant.

The primary purpose of this report is to provide DHE with timely information and feedback that can be used for program monitoring, improvement, and technical assistance. The annual report submitted at the conclusion of year 1will also provide a thorough description of background, methods, and findings.

Methodology

UMDI conducted one-hour phone interviews with 1 to -2 individuals at each site between mid-March and mid-April 2014. Interviews were conducted predominantly with the individuals who hold the primary responsibility for overseeing the project at their site. Interviewees included college administrators, program managers (both faculty and staff), and institutional research personnel. The interview protocol was developed in conjunction with DHE and focused on program start-up, awareness, outreach and recruiting activities, and programmatic plans for the summer (see Appendix A). The protocol also included reflective questions to provide formative and implementation process feedback to DHE. At the time of the interviews, program implementation activities mostly revolved around recruiting and planning for summer programs.

Findings

Overview

At the time of the interviews, all SSA sites were actively engaged in recruitment activities and also working to plan a variety of SSA-affiliated summer programs. Recruitment activities focused primarily on high school students and current community college students, including many students from groups underrepresented in STEM fields of study. Although it was still too early in the process to gauge the success of these recruitment efforts, many sites reported receiving positive responses to both to the colleges' outreach efforts and the SSA initiative more generally from prospective students, community members, and high school staff. Sites' plans for summer activities focused on helping students make the transition from high school to college or from developmental coursework to college-level coursework. Most summer programming designs included developmental math, college skills prep, expanded student support services, and STEM career exploration. The programs, as they were planned, varied in length and academic intensity. Many sites planned to incorporate curricular approaches during summer SSA programming that included contextualization, activity-based learning, modularization, and/or self-paced learning. The plans of every site included some activities that reflected "best practices" identified in the literature on community college student success in STEM fields as well as many innovative and promising practices worth revisiting as the SSA initiative moves forward[1]. In general, the sites were glad for the opportunities provided by SSA, eager to learn from the results of this initial grant period, and committed to moving the initiative forward.

Best Practices

SSA implementation plans at every site included some of the practices recommended by the literature on STEM student success in community colleges. Many sites drew on their own past experience (or the experiences of other institutions) to identify these practices. When asked about best practices, many sites expressed an eagerness for the opportunity provided by the SSA initiative to learn from their own and other sites' experiences with recruitment, retention, measurement, and program design issues such as cohort development.

Details about how these practices have been incorporated into SSA implementation at the various sites are embedded throughout the body of this report. Here, we highlight these practices in brief, roughly grouping them by their prevalence of implementation across sites.

Half to a third of all sites' plans included the following "best practices":

- Enhancing or expanding student support services – including extra tutoring, intrusive advising, career counseling, and other services.
- Connecting career possibilities to academic programs – emphasizing career prospects as a means of encouraging students to enroll, persist, and complete their programs.
- Encouraging cohort solidification – increasing a sense of connection among a group of students.
- Offering financial support – including book vouchers, tuition and fee waivers, and stipends.
- Engaging faculty in the initiative – including involvement in planning and design, recruitment, or advising and mentoring.

[1] Some of these "best practices" are referenced in the document "STEM Starter Academy: Promising Practices for STEM Programs in Community Colleges" that was prepared by the UMass Donahue Institute for the Massachusetts Department of Higher Education (DHE) as a resource for community colleges participating in the STEM Starter Academy (SSA) initiative. See Appendix L.

- Developing and revising curricula – increasing content relevance through contextualization, modularization, co-requisite remediation, and/or activity-based learning.
- Incorporating technology to advise and support students – including using software to enhance advising/mentoring/career counseling, e-portfolios, video tutorials, and social media.
- Involving industry and alumni – including in mentorship, career exploration, and transfer opportunity programming.
- Clarifying criteria for progress and completion – including creating degree/transfer maps and guidelines and student course plans.

About a third of sites' plans included the following practices:

- Using hands-on strategies such as workshops or demonstrations to recruit prospective students to SSA.
- Collaborating with high schools on curricular alignment to make it easier for high school students to move into STEM degree programs at community colleges.
- Building relationships between community colleges and high school faculty and staff.
- Providing internship opportunities to STEM students.
- Involving parents and families to facilitate recruitment and retention.
- Developing peer mentorship programs.
- Working with 4-year institutions on transfer alignment.
- Creating facilitated study opportunities.
- Facilitating research-like opportunities for students.

A handful of sites (2 or 3) reported planning or implementing the following practices:

- Fostering faculty-student relationships.
- Involving current community college students in recruitment activities.
- Mandating some form of support service use.
- Offering financial literacy support.
- Creating physical study spaces.
- Helping students prepare for testing.
- Engaging with the community in program design.
- Offering professional development for college faculty.
- Exposing students to role models from underrepresented groups.
- Adapting programs to meet the needs of working students.

SSA Implementation Findings

Program Focus

Transitions. All of the sites planned to use SSA funding to help students transition from high school into college, many by specifically targeting the transition through developmental math and into college level math or STEM courses. At the early stage of the initiative when these interviews were conducted, most of the sites were

planning for these initial transitions, although a few mentioned some other transitions they planned to address with SSA funding, including transitions along the K-12 pipeline, transition between the 1st and 2nd year of college, transfer to 4-year colleges, and transition to careers.

Target Populations. All but two sites primarily recruited high school students for their summer programming, but most sites also recruited or allowed current community college students (usually those in their first year) to participate. One site recruited *only* their existing students, who were perceived as "wallowing" in developmental math. Another site planned a summer bridge for adult basic education students in addition to a bridge program targeted to high school and current community college students. Graduating high school seniors were the target audiences for summer programming at most sties, but two sites planned dual enrollment programs for high school juniors. Four sites planned to work with middle school students to build their interest in STEM and their relationship with the colleges as part of extending a K-12 STEM pipeline.

About half of the sites also aimed to attract specific populations, including women, military veterans, racial minorities, first-generation college students, or adult returning populations. Many of these sites did not have targeted recruitment plans for these populations, but almost all had some activities that would boost access for these populations to the site's SSA programming. These activities included recruiting from local "high-minority" or "high-needs" schools; collaborating with college offices such as the veterans' office or Adult Basic Education; working with community agencies such as employment or relocation assistance programs; reaching out to parents and families; scheduling SSA programs in the evenings so day-working students could attend; and bringing speakers who represented minority populations in STEM to talk about their experiences and careers.

Although most sites were focused on students who needed support with developmental math, one site aimed to recruit students who were ready for college-level math into STEM programs of study. The reasoning was that SSA might attract these latter students who are more likely to do well in STEM fields but might not have considered them.

Another site focused on incoming students with a existing interest in STEM. The administrator reasoned that there is still "tremendous early attrition" even among students with existing STEM interest, and without additional help, many would not make it through the program. The SSA program at this site planned to combine students' existing interest in STEM with additional academic help in order to promote persistence and program completion.

A third site focused on recruiting students from local high schools who were traditionally-aged, planned to attend community college, and were interested in STEM. These students were most "at risk" of non-completion, according to administrators, and most likely to benefit from participation in SSA. Their better-prepared peers might not consider attending their local community college, administrators argued, and non-traditionally aged students often have the kind of "diligence and commitment" that gives them an advantage as students.

Program Coordination and Administration

The administrative structure for SSA was similar for most sites. The greatest variation was in the structure and role of the advisory group. The primary SSA administrator at 14 out of 15 sites worked out of academic affairs. One worked out of student affairs. Eleven of the 15 administrators were deans and the remaining were directors or vice presidents.

Every site planned to have a coordinator in charge of summer SSA programming. Some of these coordinators were to be faculty and others staff. In most cases, these coordinators also served as more general SSA or STEM program coordinators or managers; however, two sites planned to have coordinators only for their summer programming.

There was collaborative work at every site, but the sites varied in the nature of the committees they had formed to advise, implement, or steer SSA work. A few had broad coalitions across many college divisions, while others

had smaller implementation groups or executive committees. A couple of sites had nested SSA within larger STEM-focused projects that have their own advisory boards and therefore did not have an SSA-specific advisory group. Finally, a few sites did not have committees or advisory boards, but nevertheless said that implementing SSA was a "collaborative process."

Activities and Practices

Awareness, outreach and recruiting efforts. All sites were engaged in some sort of outreach efforts for SSA this spring, primarily to recruit for their SSA summer programming. At least nine sites held some sort of recruitment or STEM awareness event at their campuses. Many of these events included hands-on activities (e.g. a DNA sequencing activity at one site) and STEM career and majors information. At least one included a financial literacy session. Six sites specifically included career awareness activities as part of their SSA recruitment strategy. At least six sites visited local high schools either to give presentations or to meet with students or staff. Half of these sites reported sending faculty as part of these visits to give demonstrations, talk about STEM coursework, and discuss possible career options. Five sites sent invitation letters as a means of recruiting prospective students. Two sent SSA representatives to local STEM-focused events to recruit. At least four sites developed print marketing materials. One site advertised their SSA program on a local radio station.

Aside from more traditional recruiting events, visits, and letters, seven sites were engaged in relationship-building with high schools through other means. One site was teaching self-paced math courses at local high schools using a mobile math lab. Two sites held breakfast events - one with area superintendents, and one with high school faculty and guidance counselors. One other site sent letters from the college president to all area superintendents. Four sites planned professional development or curriculum alignment workshops to facilitate collaboration between community college and high school faculty. In addition to working with high schools, four sites explicitly reached out to parents and families, built up their online presence, or fostered relationships with students farther down the K-12 pipeline.

In terms of recruiting and engaging students, two sites emphasized the importance of framing SSA as a state-wide initiative. One representative said,

> I'm working to develop a sense in these students that they are part of something special and it's going to make a difference in their college career. … [It would be helpful to] tell those students… that they're not just at the [College] Academy - they're at one component of this large statewide Massachusetts STEM Academy.

This administrator felt that students would be more likely to join and remain committed to SSA if they understood SSA to be part of a larger, statewide project.

Collaboration between SSA and Admissions. The level of collaboration between SSA staff and college admissions offices for outreach activities varied. Seven sites collaborated closely with their admissions (or "access and transition") offices to do outreach and recruitment for SSA. Several commented that they "piggybacked" SSA recruitment onto existing admissions events, or that they had been receiving good referrals from the admissions office, or that the admissions office recruited for their SSA outreach events. One site administrator emphasized the need "to be sensitive that we are not re-creating an admissions program in doing this grant" and suggested that close collaboration between SSA staff and admissions helped keep SSA staff from over-reaching into admissions territory.

Three sites discussed their intentions or efforts to build stronger relationships with their admissions offices. An administrator at one of those sites suggested that better coordination between SSA and admissions would help them avoid, "creating confusion with partner high schools because we're pushing things out, but maybe not

collaboratively. One hand doesn't know what the other is doing and the schools are saying, 'Wait, didn't you already do that?'" In contrast, one site specifically discussed the importance of doing some SSA outreach separate from admissions office activities, saying that their admissions office faced limitations in their ability to share contacts and in how much outreach they could or would do in addition to their regular practices. Finally, two sites mentioned admissions only to say that admissions representatives were on their advisory or implementation committees and two sites made no specific mention of admissions as it related to SSA.

Summer Bridge Programs. Every SSA site had some form of summer programming planned for 2014, although most sites were still in the development phase at the time of the interviews and their program plans were still in flux. The summer programs, as they were planned, generally fell into three broad categories: academic coursework, interest, and readiness. The majority of sites planned to include some form of academic coursework in their summer programming, which commonly involved developmental math, and in many cases also included college level math or science. At least four sites also planned summer interest or readiness programs. Interest programs did not involve academic coursework, but aimed to boost student interest in STEM fields. Readiness programs also focused on facilitating STEM interest, and additionally included some preparatory workshops such as college success courses or preparation for placement tests.

Math skills were a major part of the planned summer curriculum at every site, but the level of math-intensive focus varied by site. The majority of sites (11 of 15) made math the central focus of summer programming, with all but one of these sites focused on helping students successfully complete developmental math. At the remaining site, mentioned above, SSA administrators hoped to capture students ready for college level math who might not have considered STEM majors. At the sites where math was not the central focus of summer programming, it remained a prominent emphasis. One site planned to offer a math boot camp before a science and college-readiness oriented summer bridge program; another planned to give students a choice between science and math courses during summer bridge; a third planned to offer a science class with math embedded in such a way that students would earn transferrable math credit; and the fourth focused on encouraging students to take science and math in high school and also planned to offer some "basic skills" workshops and tutoring that include math skills. After math, the most common disciplinary focuses for summer SSA programs were engineering and biotechnology, followed by computer science and lab sciences (biology and chemistry).

Every school planned to offer financial assistance to students participating in SSA programming. Fourteen of the 15 schools planned to help students pay for summer programming itself, including tuition (for those who were enrolled) or program fees (for those who attended non-academic-based programming) and books and materials. The remaining school asked students to pay for their regular summer session tuition and fees but students' participation in summer SSA programming would enter them into a lottery for an SSA-supported scholarship in the fall. One site planned to provide students with loan-to-own laptops or tablets. Interestingly, two sites mentioned past experiences where students failed to show up for programs that were offered for free. These sites left some portion of summer costs for students to pay so that students might feel more invested and "have some skin in the game" as one person put it.

The length of planned summer programs varied by site. Of the 11 sites that reported on length, five planned summer SSA programs in the 2-5 week range, four in the 6-10 week range, and two planned summer programs that run longer than 10 weeks. The length of the day and the number of weeks in the session were issues of uncertainty for several sites. One administrator said that their original plan had been to construct a day with math content in the morning and science content in the afternoon, so all students would receive math content, but could choose which science course to take. However, the administrator said:

> As we started to put that day together, it was a very long day, literally leaving no time almost to go home and recuperate before you come in and do it [again] the next day. So then it became, "Well, when are they

> going to actually have time to study?" So, that's when we moved to this running everything in the morning idea.

At another site, the administrator highlighted a tradeoff between the length of the program in weeks (offering one kind of challenge) and the length of the day (offering another challenge), especially when taking the course content into account:

> Eight weeks is a challenge and I don't know if we're going to be able to do it. But if you're talking about a pre-calculus course, how do you do that in 4 or 5 weeks? And there is a life out there, too, for these high school graduates. They don't want to sit in a class 8 hours a day and I don't want them to. So, how do we balance that?

Offering students additional advising, tutoring, or mentoring were common elements of almost every site's plan. At most sites, these support services were to be integrated into the college's more general support infrastructure for students in STEM (and not just summer bridge programming); accordingly, these activities are discussed in their own section of this report.

A few additional features of the SSA sites' summer program planning are worth mentioning:

- About half the sites mentioned field trips to industry sites as part of their summer programs.
- Another half explicitly mentioned college success skills classes or workshops.
- A couple of sites planned to make their summer bridge programs accessible to working students by scheduling some of their classes in the evenings.
- Three sites were incorporating study time or space into their summer programming.
    - One site planned to mandate time in a dedicated study area each day.
    - Another had open, optional math lab hours in the afternoons, staffed by tutors.
    - A third was considering using time spent in math or science studio hours as criteria for students to receive financial assistance.
- At least a third of the sites planned to require students to enroll at the college (or at minimum apply) in order to participate in SSA summer programming.
- One site required students to declare a STEM major as a prerequisite to summer SSA participation.

Curriculum Development. Most sites (10) had focused their curriculum development efforts on contextualizing their math or college skills curricula for STEM disciplines. Although contextualization was a fairly consistent theme, not all sites were doing this curriculum development work as part of SSA. At some sites this work was completed before the SSA grant and for other sites it was being funded by different monies. The administrator for a site that used SSA funds to contextualize their curriculum described the value of this work:

> SSA provides the way to do something that I've wanted to do for a long time: help orient students and open their eyes to the possibilities that a STEM or engineering career upfront. It's very well-known that a tremendous barrier to STEM careers is that most have a high math barrier before you really get to any interesting classes. In our engineering transfer program, you have to be in calculus1 before you can take any course that's really related to engineering. So, you need a student with a pre-existing interest and commitment who is going to get through the math before they get to do what they really came there to do. And there is data to show that if you can put some of the engineering up front so that they can get that – catch their interest – then you can bring in a lot of students that you might otherwise miss.

Sites also put energy toward a few other curriculum development activities as part of SSA. A third of sites planned to or had already created differentiated math pathways for students with different disciplinary or programmatic interests. This included one site that planned to use the Carnegie Foundation's Pathways models ("Statway" and "Quantway"), which were designed to address psychological barriers to math. A third of the sites had also been redesigning or developing new STEM courses with the support of SSA funding, several through cross-disciplinary faculty collaboration. A few sites planned to connect college and high school faculty to work on curricular alignment or were connecting community college and 4-year college faculty to facilitate transfer alignment.

Six sites planned to use computer-aided, or "self-paced" math software with a modularized curriculum as part of their SSA programming. Several of these sites discussed the success they had had with existing implementation or pilot tests of this model and noted that they were looking forward to expanding their capacity with SSA funding. Most sites using this model planned to have two instructors in the room, or an instructor and a tutor so that one of the instructors could answer individual questions or do a "pull-out" session with students who might need extra help with a particular concept.

Dual enrollment programs were part of planned SSA programming at six sites. Three of those sites planned dual enrollment courses as part of their summer SSA programming. Two sites offered dual enrollment courses supported by SSA this spring (one of which will also have dual enrollment in the summer) and another two planned to offer dual enrollment SSA courses in the fall.

Student Support Services. Almost all of the sites planned to offer some form of enhanced student support services as part of SSA. Two-thirds of sites discussed connecting students to faculty advisors or to discipline-specific advisors. About a third explicitly mentioned using "intrusive" advising strategies. About half of sites planned to increase tutoring or career advising and three had already done so at the time of the interview. Three sites planned faculty-facilitated study groups. About a third of sites had designated an individual who served in several student support roles, including academic advisor, mentor, and career coach.

Five sites had existing physical "centers" of student support services and/or study spaces to support SSA students (and others). Three of these sites had set aside study areas specifically for STEM students, two of which were staffed by tutors or faculty. The other two sites had more comprehensive support centers (one specifically for STEM students) that included career and educational advising, group and individual coaching or tutoring, and space to study.

Most of the sites' student support plans included activities designed to cultivate a greater sense of connection within cohorts of students. The most common strategies involved building cohort connections through coursework and creating group-based support activities. Practices that sites planned to use to build connections through coursework included structuring in-class activities as group work, creating "learning communities" where a group of students takes a few classes together in the same semester, or using block scheduling to move students through a sequence of courses as a group. Sites also planned to implement group-based support activities, such as study groups, cohort-wide meetings for enrichment activities (e.g. a career speaker series), group-based advising, a central "go to person" for a whole cohort, or a physical space where students can gather to study or access support services. One site hoped to give students a greater sense of connection by recruiting students of similar age and backgrounds. Another site planned to offer short disciplinary workshops between summer SSA programming and the fall semester to maintain students' engagement with STEM and solidify cohort groups.

Half of the sites planned to use advising software or other technological tools to enhance student support. Five sites already used or planned to use advising software such as Degree Works or StarFish to track student progress in their coursework. For example, one site had an "early alert" system that would notify an advisor if a student was not showing up to class or was in danger of failing a course. Looking to the future, an administrator at that

site imagined creating a similar "early alert" notification system at the degree completion level. In this vision, "an alert would happen if the pipeline is leaking" – for example if a student was off track for their academic plan (e.g. not registered for the next course in their planned sequence). Four sites used technological tools other than advising software. One site planned to offer students "career cruising" software, which would allow students to connect with volunteer mentors from local industries through an online social network. Another site had an "e-portfolio" system that allowed students to collect their work digitally so they and their advisors could better track and assess the student's progress over time. At another site, the STEM career coach used technology to reach out and make connections with students who were typically reluctant to come to the career center. The coach used social media to connect with students and also created online modules to allow students to do some career exploration online (e.g. strengths/interests questionnaires). The administrator explained that, after exploring these tools on their own, students were often more willing to come in and meet with the career counselor. That site had also created technological tools in the form of department-generated videos that provide discipline-specific orientation information to students who switch majors in the middle of a semester.

In addition to some of these technological tools, one site emphasized the way they attempted to impart a "personal touch" in their advising. Using their advising software to identify students who have not yet registered for the following semester, departments distributed these lists to faculty members who then made personal phone calls to students in their departments to encourage them to register.

Mapping Academic and Career Pathways. Almost all of the sites had strategies in place designed to clarify to students the critical steps required for degree completion, transfer opportunities, or a STEM career. The details of those strategies varied between sites. About half of the sites discussed ways to provide students with a clear course plan. One site required students to generate their own plan before completing their first 20 credits. A few sites had pre-generated course sequence maps that mark milestone courses and schedules. At a couple of sites, advisors helped students make plans using the advising software, which automatically generates reminders for students and advisors. Finally, two sites reported having very well-defined degrees and available coaching and support for students to follow them.

A few sites specifically planned to emphasize career endpoints in order to help students make academic plans. A couple sites focused instead on transfer pathways. A few sites re-designed their developmental math pathways to simplify them and to create STEM and non-STEM paths. A few sites – working on alignment with K-12 programs – were specifically interested in mapping and aligning STEM pathways between high school and college. At one such site, the administrator explained:

> The mapping that we'd like to do as part of the STEM Starter Academy is that pre-college mapping, targeted to both parents and students that says, "Look, if STEM is where you want to be, because it's cool, [these are] the courses that we suggest you take." It is going to be straightforward things like taking math every year and [specifying] what types of math you would take.

When discussing academic pathways, a couple of sites expressed concerns about the difficulty students can have taking a full 15-credit course load due to work and other obligations. This common issue extends students' time to completion and sometimes throws off their course sequencing. One site hoped to address this difficulty by offering SSA-funded stipends to STEM students who could make up course credits over the summer.

Faculty Engagement. All sites planned to engage faculty in SSA in some way. The most common activities for faculty engagement included acting as advisors, participating in outreach and recruitment, serving as study facilitators, participating in program planning, and developing and aligning curricula. At a third of the sites, faculty were actively engaged in program planning in some way, from having a faculty member as a program coordinator to providing opportunities for faculty to contribute suggestions, needs, and feedback regarding site-specific SSA implementation. Many sites had faculty on their advisory boards. Faculty were also engaged in SSA

at a few sites through participation in or teaching of professional development. One site planned to host an informal monthly brown bag lunch where STEM faculty and students can connect. At four sites, community college faculty were slated to work with high school faculty on curriculum alignment.

Transfer or Alignment. Most sites were working to improve transfer opportunities for their students as part of their SSA programming. One site commented that they wanted their community college to be seen "as a path, not a destination," and this seemed to be in line with what other sites felt as well. More than two-thirds of sites (11 of 15) discussed specific programs related to course transfer or alignment with 4-year colleges. Three sites noted the clarity and established success of their existing transfer pathways that would also benefit SSA students. Four sites planned transfer-specific SSA programming: incorporating transfer-pathway knowledge into their summer programs, hosting transfer events during the academic year with visitors from 4-year schools, or inviting 4- year college faculty to come teach courses at the community college.

Career Awareness. Career awareness activities were a part of every site's planned SSA programming. The most common strategies for incorporating career awareness were 1) building career exploration into summer bridge programs, 2) using a focus on careers as a recruitment tool, 3) creating activities that explicitly connect programs of study with career opportunities, and 4) enhancing or expanding career advising. Career awareness was to be incorporated into SSA programming through field trips, internships, career-oriented campus visitors, lectures and speaker series and hands on activities tied to career opportunities. Career paths were also to be emphasized through coaching, advising, mentoring and career exploration software. One site used SSA funds to send students to a STEM-themed conference from which the students returned with new understanding and enthusiasm for the STEM career paths they had seen. A focus on careers was also an explicit part of many sites' recruitment strategies for SSA, both for current college applicants and for younger students further down the "pipeline." Several sites also planned to focus on career options as a retention strategy, to tie academic work to career prospects and emphasize the opportunities that come with completion. One administrator explained that one of their goals was:

> to increase students' awareness of what is the endpoint if you have one of these degrees. What sort of job might you end up with? … That's an aspect of transparency. What can you do with that degree? We have often found that they are not aware of that.

Most sites engaged or planned to engage with local industry as part of their strategy to emphasize career pathways. Many planned to bring individuals from local industries to campus as guest speakers or to send students to visit those industries on field trips. A few sites recruited industry representatives to be on STEM advisory boards. And about a third set up internship or job shadowing programs for students with local industry. One site explained their industry engagement strategy as follows:

> Part of our role is to take people [in the community] who have been in industry jobs and put them in a situation (a lab or a classroom or seminar) so they can share experiences [with students] at all levels about what it's like to do research, what it is like to develop apps for phones and games, what it's like to do fieldwork, what it's like to be an engineer, what it's really like to be in a STEM career.

Research Experiences. A few sites (4) planned to connect their students to research opportunities. Two sites planned to send some of their students to research workshops at local 4-year colleges. One site had an agreement through the Bridges to Baccalaureate[2] program for their students to apply to study at a local university. And one site helped students apply for Research Experiences for Undergraduates grants.

Measurement. At the time of the interviews sites were in the process of developing monitoring plans and processes, identifying goals, indicators, metrics and outcomes. Although they had not yet defined specific metrics,

[2] An NIH program: http://www.nigms.nih.gov/Research/Mechanisms/Pages/BridgesBaccalaureate.aspx

all sites had ideas about the kinds of outcomes they hoped to achieve through SSA. The primary goals across all sites included academic success and retention, followed by recruitment and completion. Examples of potential indicators cited by grantees include increases in placement test scores or GPA, rates of course completion, student confidence, student use of tutoring and advising, and enrollment in STEM programs of study.

Reflections on the STEM Starter Academy Initiative

In addition to gathering information on planned and implemented SSA activities, the interview protocol included several questions asking sites to reflect on the process of SSA implementation so far. The purpose of these questions was to provide formative feedback to DHE and to sites.

Successes and Challenges

Although SSA implementation plans varied between campuses, the programs had much in common in terms of the early successes they experienced and the challenges they faced.

Common successes. Four general categories of success were the most frequently mentioned by the sites (each by about a third):

- ***Internal collaboration.*** Sites reporteded positive collaboration fostered by SSA across divisions, between disciplines, and between administrative staff and faculty.
- ***Expansion of existing successful programs.*** Several sites had already-established successful program elements that SSA funding allowed them to expand. These included tutoring services, a faculty-facilitated math studio study space, ongoing curriculum development, sending students to STEM-focused conferences, paying for professional development for faculty, and replacing ageing lab equipment.
- ***Recruitment activities.*** Several sites had already seen positive returns on their outreach and recruitment activities. Some reported that local high schools had been very receptive and excited about SSA. Others noted prospective student interest both from high school and current community college students. A few noted the engagement they had seen among parents, local industry, and community members with the SSA initiative.
- ***Hiring or staffing.*** Some sites commented on the quality of candidates they were able to recruit for SSA staff positions (some of whom already had established relationships with faculty and students) and others welcomed the additional support and programmatic capacity provided by SSA-supported staff.

Common challenges. Several common challenges in SSA implementation emerged from the interviews and fell broadly into two categories: time challenges and coordination challenges. The most common are summarized here.

- ***Time***. Sites noted several time-related challenges including the following.
  - The quick turnaround from grant initiation to implementation. One administrator commented that the timeline for the project seemed to suggest, “Go, ready, set!” Another said “We're building it as we're flying it.”
  - A large planning/implementation undertaking coming in the middle of an “already busy semester” sometimes overburdened administrators. One said, “I have about five jobs, so time is a challenge.”
  - The timing of funding availability came late in the recruitment season with respect to capturing the interest of graduating high school seniors, many of whom had already made plans for their summer and fall. The need to get into schools quickly arose before many of the programs to which students were being recruited had been developed. One administrator said, “It's awkward to go [to recruit in high schools] without all of our plans already in place because we're still developing them.”

- Administrative delays in hiring were a problem for some sites, as was attracting qualified candidates to a position with a short and uncertain timeline.

- ***Coordination and collaboration.*** Many sites noted coordination and collaboration challenges including the following.
  - Managing several grants with overlapping demands. However, most sites echoed the sentiments of one administrator, who said, Having all of that work in sync is a challenge, but it's a good problem to have."
  - Collaboratively designing and managing the logistic details of summer programming (including scheduling and finding space) across disciplines and divisions and under tight timelines.
  - Navigating relationships with campus offices and other disciplines engaged in similar activities or interested in similar resources.

Filling Gaps and Building on Strengths

A top priority of the SSA initiative is to help campuses "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, supported by grant funding" (SSA RFP 2013). A summary of sites' reflections on how SSA funding was filling gaps or building on existing strengths at their campuses follows

How SSA fills gaps for community colleges.

- ***Provides resources for developing new curricula.*** New contextualized courses, summer "academies," course sequences, and activity-based learning were implemented with SSA funding. One site said a benefit of this upfront investment in curricular development is that these already-developed courses are easier to institutionalize going forward. One administrator commented on how SSA has facilitated this kind of institutionalization:

  > I was looking more for a contextualized course, a course that brings in application problems from technology and from science. And that requires an extensive amount of work, but we didn't really have the funds … So I think SSA allowed us to … provide funding to really get this initiative going - that we didn't have. We had students entering through developmental math that wanted to go up the STEM pipeline, but they couldn't get through the intermediate algebra content.

- ***Provides opportunities for sites to implement new forms of outreach.*** Sites mentioned more STEM-focused outreach, new outreach events, better engagement of faculty in recruiting, innovative programs to build relationships with local high schools, more internal conversations about STEM focus and recruitment, better databases of contacts, increased engagement of underrepresented groups, and new incentives to engage otherwise hard to reach students.

- ***Creates opportunities to build or test new infrastructure.*** New staff positions, new lab spaces and equipment, and new approaches to internal organization and bureaucratic management were included here. One administrator emphasized the importance of staff in particular:

  > A lot of what we've been doing and will need to continue to do is build relationships, not only with K-12 districts, but also with community organizations … To have someone on the ground who can do that all the time is an enormous, enormous advantage for us and an enormous help for us.

- ***Opportunities for new student support resources.*** SSA funding enabled enrichment opportunities like research experiences, informal faculty-student interactions, peer mentorship, and also programming that supports transfer to 4-year schools or new advising or career exploration software.

Primary ways SSA builds on existing strengths for community colleges.

- ***Provides increased funding to expand or enhance existing student support resources.*** This includes mentoring, coaching, tutoring, study space, study facilitators.
- ***Provides funding to improve teaching.*** *This includes* including funding for professional development, course design or revision, course material improvement, and increased faculty involvement and collaboration.
- ***Provides opportunity to expand or expedite existing successful programs and models.*** This includes self-paced math courses, summer academies, industry/career seminar series, and advising or career exploration software.
- ***Helps to make community college programs more visible or accessible to students.*** This includes improving visibility through marketing materials (print, web, other media) and improving accessibility through transportation support to bring remote students to (esp. rural) campuses.

Innovative Practices

Every site was engaged in or had planned practices that seemed to evaluators to be both innovative and promising in terms of STEM students' success at community colleges. These practices were sometimes unique to a single site or at most, a couple of sites. Many of these practices have already been named elsewhere in this report, but evaluators found them to be worth highlighting as ones to watch as outcome data become available. They are briefly listed below, grouped into broad categories.

- **Infrastructure**
  - A common physical space designated as study space and also a place to access advising and other student support services.
  - A regional resource-sharing website to share curricula and through which, potentially, to teach virtual courses.
  - Creating mobile math labs that allow college instructors to teach self-paced math at high schools.
- **Outreach**
  - Recruiting through a low-barrier STEM club. Students are invited to do hands on activities or take workshops that are open to anyone.
  - Hiring a current student as an SSA recruitment coordinator. The student already has relationships with STEM faculty and other students.
  - Recruitment events timed to be during the period after finals and before summer session. This eases scheduling constraints for lab space and faculty (although the drawback is that few current students are around).
  - Focusing on encouraging students with higher-level math skills (as opposed to those in developmental math) to choose STEM majors (versus other popular majors).
  - Breakfast events to build relationships between community college staff and faculty and local high school staff or area superintendents.
  - Radio advertisements for summer SSA programs.
- **Student support services**
  - A math studio staffed by faculty.
  - Summer tuition support for current students who do not have remaining financial aid for the summer. This tuition support is targeted to STEM students whose work schedules prevent them from taking 15 credits in a semester, so they can catch up on sequential coursework over the summer.

  - Offering enrollment support (help with registration and financial aid applications, etc.) as part of summer bridge programming or recruitment events.
  - STEM-specific professional development *for support staff* to enable them to better understand STEM-specific programmatic needs in recruiting.
  - Discipline-specific videos to provide students with orientation information if they switch majors part way through the semester.

- **Increasing engagement with STEM**
  - An informal, monthly, brown bag STEM lunch with faculty and students.
  - A community service component incorporated into the summer bridge program. Students can use what they have learned to design and implement a project in the community.
  - A "stretched out" dual enrollment STEM course that extends through high school students' senior year (for students who attended STEM summer programming as juniors). The course serves as a way to maintain contact with these students and keep them engaged with STEM before coming to college.
  - Cohort-based STEM workshops (4-days) that happen after summer math coursework and before the beginning of the fall semester. Reinforces STEM interest and cohort connections.
  - A faculty-led, K-12 robotics program building interest in STEM and a pipeline toward college.
  - Paid job-shadowing internships.
- **Program administration and coordination**
  - Early collaboration with faculty on SSA program design.
  - Early formation of a comprehensive advisory group.

Complementary Initiatives

Every site was engaged in external projects that overlapped in some way with the SSA initiative. These projects involved at least the following grants or organizations:

- 413 STEM grant
- ABLE for STEM grant
- AMP it UP grant – state manufacturing partnership grant
- @Scale grant for a STEM advisory network
- BATEC (curriculum revision in IT and computer science)
- Bridges to Baccalaureate - provides facilitated study groups in STEM and research opportunities
- Carnegie Foundation Pathways Initiative
- Complete College America - Guided Pathways to Success
- Mass Life Science Grant
- NSF grant focused on recruiting students into engineering
- NSF STEP UP grant
- Open Cape grant to create regional area fiber-optic network
- PIF grants (various)

Lessons Learned

At the time of the interviews, only a couple of sites had gotten far enough along in their SSA programming to have learned some lessons from their experiences. Those sites shared some of what they might do differently next time.

One site ran dual-enrollment learning communities in the spring, combining a computer-aided developmental math course with a college success course. They ran the program one evening per week, but found that the additional four hours of coursework on top of a full high-school day was too much for many students, and attrition was quite high. At the time of the interview, they had just added in some break time and free snacks.

Another site reflected on their recruitment fair, and thought of a few things they might do differently next time. First, they thought that it might be better scheduled for fall rather than spring, so students could have more time to think about their options. Their fair had targeted high school seniors, but the site administrator wondered if it would have been better to target juniors. The administrator thought that such targeting might allow the college to build a longer-term relationship with students and encourage them to take more math and science in high school in order to be prepared for a STEM program or career. Finally, the fair's organizers had left out certain STEM disciplines (computer science and math) from the fair because organizers had thought of them as less "hands on" fields. Faculty informed the organizers that they had exciting demonstrations to offer and organizers planned to include those disciplines next time.

Feedback to or about DHE

When sites were asked for feedback about SSA's implementation more generally, a few common themes emerged. By far the most common responses were enthusiasm for the initiative. For example:

> "This is a great opportunity."
>
> "We're grateful for the infusion of resources."
>
> "[We're] thrilled to have a focus on STEM."
>
> "Overall, DHE has been very responsive and quick."
>
> "[We] appreciated the ideas and energy of the people working on this project."

The next most common pieces of feedback reflect a desire for facilitated collaboration. Many sites expressed a strong wish for a face-to-face meeting. They wanted to have a better sense of what other sites were doing, but the online group site felt overwhelming to some ("too many documents, so much information to read," said one) and incomplete to others. Several noted that the conference call format was not ideal for sharing information and resources and suggested something more like a webinar.

Sites also wanted to be able to know what was ahead for SSA and plan for a longer-horizon future. One administrator said, "It seems to be an awful lot of work for a one-summer thing." One site wanted to see collaboration between sites to keep the funding ongoing.

Individual sites also provided some feedback that was not part of one of these broader themes, for example:

- A couple of sites wanted a greater state-wide presence or identity for SSA.
- One site thought it would be easier for inter-site collaboration *after* each site had collected some data. The administrator looked forward to sharing and learning from outcomes rather than "just ideas."
- One site appreciated the flexibility SSA provided "to design a program that will work with our campus – not an 'everyone is going to do this'" kind of initiative.

- One site felt uncertain about DHE's expectations for what SSA sites would accomplish and sought examples of the kinds of milestones DHE would like sites to be measuring or tracking.
- One site sought formative feedback, saying, "If you provide us with feedback as the project is in progress, that would be really helpful, rather than [us] finding out at the end that we could have done something differently that would have made an impact."
- One site that was engaged heavily in infrastructure and curriculum development worried that it would be harder to measure or demonstrate its success because students might not be directly impacted during the current grant cycle.

Future Plans

About half of the sites discussed future plans for their SSA implementation and STEM programs, some of which were already in the works and others that depended on another round of SSA funding. Many planned to expand or enhance student support services, including:

- Creating resource, study, or support centers
- Implementing an "achievement coach" model in which a faulty advisor also works with students in the classroom
- Creating early alerts in advising software to help warn advisors when students are off track for degree completion
- Building sustainable recruiting advising tools such as videos, and
- Developing closer ties between SSA, advising and career services.

A few sites were working on curriculum or pedagogy for 2015. Some were designing new courses. Another was thinking about changing their summer bridge offerings in the future to be more discipline-specific. One planned to focus more on faculty development. And one was considering trying out a different scheduling system (block scheduling) to help keep students connected to their cohort.

One site envisioned a campus-wide STEM director in the future, who would do outreach, pipeline development, and transition programs for STEM students.

One site planned to develop an NSF grant proposal based on their experiences with SSA.

STEM Starter Academy – Selected site visits
Observation Protocol – Summer 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
Observation Protocol – Summer 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?

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?
- What learning activities are observed?
    - What pedagogical strategies are used?
    - Describe students' engagement in the activities.
    - Approximately how many students/staff are in attendance?
- Resources and support
    - What physical resources are available to students? (e.g., technology, space)
    - What student supports (academic, social, emotional, etc.) are observed?
- What enrichment activities are observed?
    - Describe students' engagement in these activities.
- Any issues which suggest student/teacher/administrator successes, challenges, desires, etc.?
- What types of student participation and engagement are observed?

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?

Interview Protocol for Key SSA Staff During Site Visit (30 minutes)

General Information

Interviewee_____ Position_____

Community College _____ Date/Time _____

Phone Number _____

Introduction [3 minutes]

- Thank you for taking the time to speak with me today. The purpose of this brief interview is to learn how summer SSA programming is going on your campus.
- We will be sharing the findings from this interview with interested parties, such as the Massachusetts Department of Higher Education (or DHE), and possibly other institutions of higher education. 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 us know, and we will honor your preference for confidentiality.
- (Ask for permission to use recorder before starting the recorder and after.)

Questions:

1. Can you please give me a quick overview of the SSA-affiliated activities your institution is implementing this summer? Which of these activities have you been involved with?

2. What SSA summer activities do you feel have been most successful? Please explain. What factors have facilitated those successes?

3. Can you share an example that illustrates a contribution SSA is making to student success in STEM at your institution?

4. What challenges have you faced with your summer SSA programming so far? How are you addressing those challenges? Have these challenges let you to think about making any changes to next year's program? What kinds of changes?

5. What do you see as the key next steps for the SSA programs and activities to be implemented effectively at your institution?

6. What are the emerging "best practices" that you'll work to carry forward in your STEM programs in the future?

7. What aspects of planning summer SSA activities were particularly successful? What aspects of planning were challenging?

8. Is there anything else you'd like to share about SSA programming on your campus?

SSA Site Visit: Student Interview or Focus Group Questions – Summer 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 State Department of Higher Education to help evaluate the STEM Starter Academy Initiative (which I will refer to as SSA). My goal is to gather feedback on SSA programs.

Explanation of focus group: This will be an informal, but focused discussion. I will ask some guiding questions, and I'll listen and take notes as you respond to one another and offer answers to the questions. I won't call on one person or another, unless I ask you to clarify something you have said. Don't feel like you have to answer all the questions, but do participate to the extent you are comfortable. It's okay to talk to one another. If someone says something that you'd like to respond to, please do that.

It's okay to agree or disagree with one another, and 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 summer and fall. 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. If you do talk about the discussion we have today, do not mention any names. Is that clear?

We 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 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 the SSA program– what kinds of activities, supports, or classes have you or will you participate in? For example, credit bearing classes, tuition support, study skills classes, tutoring, advising, field trips?
2. What do you like most about the parts of the STEM Starter Academy program you've experienced so far? Can you give me an example of a particularly positive experience?
3. What do you find the most challenging about the SSA program? Can you give me an example of a particularly challenging experience?
4. If you were in charge of this program, what would you change about it?
5. Has the SSA program influenced your desire to work in a science, technology, engineering, or mathematics career? How? Please explain.
6. What kinds of training and support have been most helpful to you? Is there some kind of training or support that would make your experience better?
7. What advice do you have for students who will join the SSA program next year? What do you wish you would have known?
8. Is there anything else you'd like to share about the SSA program at your campus?

STEM Starter Academy Evaluation Survey - Spring and Summer 2014

This survey is being conducted by the UMass Donahue Institute on behalf of the Massachusetts Department of Higher Education. Each community college will receive one invitation to complete this survey. The purpose of this survey is to develop a deeper understanding of what is happening at community colleges that are developing and implementing programs with STEM Starter Academy funding support.

If you have questions about this survey, please contact:
Jeremiah Johnson (jjohnson@donahue.umassp.edu, 774-455-7377) or
Jackie Stein (jstein@donahue.umassp.edu, 413-587-2409).

Thank you for your participation in this survey.

Please complete this survey by *****October 3, 2014*****

First, please tell us a little bit about your role.

I am knowledgeable about my institutions plans, actions, and perspectives related to the STEM Starter Academy grant.

- ❍ Strongly Agree
- ❍ Agree
- ❍ Neither Agree nor Disagree
- ❍ Disagree
- ❍ Strongly Disagree

(Please note: If you choose "Disagree" or "Strongly Disagree" we will ask you to suggest another individual at your institution to whom we can send this survey and the survey will end. You will not be able to return to this page without restarting the survey.)

SKIP LOGIC: If Disagree or Strongly Disagree, then

Please recommend an alternative contact from your community college whom you believe is knowledgeable about your institution's plans, actions, and perspectives related to the STEM Starter Academy grant.

Name:
Email:
Title:

Thank you for completing this survey! If you have any questions about the STEM Starter Academy evaluation, you can contact Jeremiah Johnson at jjohnson@donahue.umassp.edu or 774-455-7377.

Survey Ends

In the remaining questions, to the best of your ability please represent your institution's perspective rather than your personal opinion. Please feel free to consult with SSA colleagues from your college to answer the questions in this survey as fully as possible.

This survey is divided into two major sections. Section 1 contains questions related to your institution's spring 2014 SSA activities and Section 2 contains questions related to your institution's summer 2014 SSA activities.

You do not need to complete the survey all at one time. Your progress in the survey is saved automatically when you close the browser window. To return to where you left off, use the link to this survey that was emailed to you.

Section 1: Reflecting on Spring 2014 Activities

1. Please indicate the spring 2014 status of each activity listed in the following tables (summer activities will be captured in another section).

	Implemented during spring 2014 with at least partial SSA support or funding	Implemented during spring 2014 without SSA support or funding	Planned, but not implemented in spring 2014	Did not take place	I don't know
Outreach to or Recruitment of:					
High school seniors	❍	❍	❍	❍	❍
High school freshmen, sophomores, or juniors	❍	❍	❍	❍	❍
Elementary or middle school students	❍	❍	❍	❍	❍
Current, undeclared community college students	❍	❍	❍	❍	❍
Current community college students with developmental math placements	❍	❍	❍	❍	❍
Current community college students in STEM programs	❍	❍	❍	❍	❍
Parents and families of prospective students or participants	❍	❍	❍	❍	❍
High school counselors, faculty, or administrators	❍	❍	❍	❍	❍
Adult learners	❍	❍	❍	❍	❍
Underrepresented groups (Please specify): {response box available}	❍	❍	❍	❍	❍

	Implemented during spring 2014 with at least partial SSA support or funding	Implemented during spring 2014 without SSA support or funding	Planned, but not implemented in spring 2014	Did not take place	I don't know
Outreach or Recruitment Materials					
Development or dissemination of paper-based materials	❍	❍	❍	❍	❍
Development or dissemination of online materials	❍	❍	❍	❍	❍
Outreach or Recruitment Events					
At your campus	❍	❍	❍	❍	❍
At a high school	❍	❍	❍	❍	❍
At other locations (Please specify):	❍	❍	❍	❍	❍

	Implemented during spring 2014 with at least partial SSA support or funding	Implemented during spring 2014 without SSA support or funding	Planned, but not implemented in spring 2014	Did not take place	I don't know
Other Spring 2014 Outreach or Recruitment Activities					
Faculty involvement in outreach or recruitment	❍	❍	❍	❍	❍
Current community college student involvement in outreach or recruitment	❍	❍	❍	❍	❍
Hands-on STEM activities or demonstrations	❍	❍	❍	❍	❍
Enrollment support (e.g., help with enrollment, registration, or financial aid application)	❍	❍	❍	❍	❍
STEM program exploration/majors fair	❍	❍	❍	❍	❍
Other outreach or recruitment activities (Please specify):	❍	❍	❍	❍	❍

	Implemented during spring 2014 with at least partial SSA support or funding	Implemented during spring 2014 without SSA support or funding	Planned, but not implemented in spring 2014	Did not take place	I don't know
Career exploration activities					
Speakers from industry or alumni	❍	❍	❍	❍	❍
Speakers from community college	❍	❍	❍	❍	❍
Field trips	❍	❍	❍	❍	❍
Other career exploration activities (Please specify):	❍	❍	❍	❍	❍

Please use this space to add any clarifying information for the above tables, as needed.

2. Please indicate the spring 2014 status of each activity listed in the following tables.

Spring 2014 Academic Programs and Curriculum Development

	Implemented during spring 2014 with at least partial SSA support or funding	Implemented during spring 2014 without SSA support or funding	Planned, but not implemented in spring 2014	Did not take place	I don't know
STEM dual enrollment courses	❍	❍	❍	❍	❍
STEM curriculum development/revision	❍	❍	❍	❍	❍
Curriculum alignment with K-12 institutions	❍	❍	❍	❍	❍
Curriculum alignment with 4-year institutions	❍	❍	❍	❍	❍
STEM credit courses (e.g., Intro to STEM, BIO101, CHEM101)	❍	❍	❍	❍	❍
STEM-based college success course	❍	❍	❍	❍	❍
Other (Please specify):	❍	❍	❍	❍	❍

Spring 2014 Student Support Services

	Implemented during spring 2014 with at least partial SSA support or funding	Implemented during spring 2014 without SSA support or funding	Planned, but not implemented in spring 2014	Did not take place	I don't know
Mentoring, Advising, or Coaching					
Development or clarification of STEM pathways	❍	❍	❍	❍	❍
STEM discipline-specific advising	❍	❍	❍	❍	❍
Faculty advisors	❍	❍	❍	❍	❍
"Intrusive advising" (Please describe below)	❍	❍	❍	❍	❍
Transfer-specific advising/support	❍	❍	❍	❍	❍
STEM coaches (Please describe below)	❍	❍	❍	❍	❍
Peer mentoring or advising	❍	❍	❍	❍	❍
Career mentoring, advising, or coaching	❍	❍	❍	❍	❍
Advising software used	❍	❍	❍	❍	❍
Other (Please specify):	❍	❍	❍	❍	❍

Please use this space to add any clarifying information, as needed.

	Implemented during spring 2014 with at least partial SSA support or funding	Implemented during spring 2014 without SSA support or funding	Planned, but not implemented in spring 2014	Did not take place	I don't know
Orientation, Tutoring, and Test Prep					
Student orientation with STEM enhancements	❍	❍	❍	❍	❍
Professional tutoring	❍	❍	❍	❍	❍
Peer tutoring	❍	❍	❍	❍	❍
Facilitated study groups	❍	❍	❍	❍	❍
Accuplacer testing	❍	❍	❍	❍	❍
Accuplacer test prep	❍	❍	❍	❍	❍
Other (Please specify):	❍	❍	❍	❍	❍

	Implemented during spring 2014 with at least partial SSA support or funding	Implemented during spring 2014 without SSA support or funding	Planned, but not implemented in spring 2014	Did not take place	I don't know
Financial or physical resources					
Physical study space provided	❍	❍	❍	❍	❍
Financial support for books, supplies, etc.	❍	❍	❍	❍	❍
Financial assistance (including tuition or fee waivers or stipends)	❍	❍	❍	❍	❍
Enrollment incentives (please describe below)	❍	❍	❍	❍	❍
Other (Please specify):	❍	❍	❍	❍	❍

Please use this space to add any clarifying information, as needed.

Spring 2014 Planning, Professional Development, and Infrastructure Enhancements

	Implemented during spring 2014 with at least partial SSA support or funding	Implemented during spring 2014 without SSA support or funding	Planned, but not implemented in spring 2014	Did not take place	I don't know
Development of lab or instructional space (including staffed study space)	❍	❍	❍	❍	❍
Hire SSA staff	❍	❍	❍	❍	❍
Professional development for K-12 teachers	❍	❍	❍	❍	❍
Professional development for college faculty	❍	❍	❍	❍	❍
STEM or SSA advisory group convened	❍	❍	❍	❍	❍
Obtain advising, career focus, simulation, or other software	❍	❍	❍	❍	❍
Other (Please specify):	❍	❍	❍	❍	❍

In the following questions, please reflect on your institution's spring 2014 STEM Starter Academy activities.

3. What were some of your college's key successes with SSA this spring? What factors facilitated those successes?

4. What challenges did your college face with SSA this spring? What strategies were used to address those challenges?

5. What SSA outreach or recruiting activities were most successful? Why were those activities successful?

6. What lessons did you take away from your spring SSA activities? What activities will you repeat next year? What will you do differently?

7. Did you target underrepresented or non-traditional students through your outreach or recruitment activities? If so, how were these groups targeted?

8. Do you have other comments about your spring 2014 SSA activities that would inform the evaluation of this initiative?

Section 2: Summer 2014 Activities

1. Please mark the elements that were included in your institution's summer 2014 SSA activities in the following tables.

Summer 2014 Student Support Services

	Implemented during summer 2014 with at least partial SSA support or funding	Implemented during summer 2014 without SSA support or funding	Planned, but not implemented in summer 2014	Did not take place	I don't know
Mentoring, Advising, or Coaching					
Development or clarification of STEM pathways	❍	❍	❍	❍	❍
STEM discipline-specific advising	❍	❍	❍	❍	❍
Faculty advisors	❍	❍	❍	❍	❍
"Intrusive advising" (Please describe below)	❍	❍	❍	❍	❍
Transfer-specific advising/support	❍	❍	❍	❍	❍
STEM coaches (Please describe below)	❍	❍	❍	❍	❍
Peer mentoring or advising	❍	❍	❍	❍	❍
Career mentoring, advising, or coaching	❍	❍	❍	❍	❍
Advising software used	❍	❍	❍	❍	❍
Other (Please specify):	❍	❍	❍	❍	❍

Please use this space to add any clarifying information, as needed.

	Implemented during summer 2014 with at least partial SSA support or funding	Implemented during summer 2014 without SSA support or funding	Planned, but not implemented in summer 2014	Did not take place	I don't know
Orientation, Tutoring, and Test Prep					
Student orientation with STEM enhancements	❍	❍	❍	❍	❍
Professional tutoring	❍	❍	❍	❍	❍
Peer tutoring	❍	❍	❍	❍	❍
Facilitated study groups	❍	❍	❍	❍	❍
Accuplacer testing	❍	❍	❍	❍	❍
Accuplacer test prep	❍	❍	❍	❍	❍
Other (Please specify):	❍	❍	❍	❍	❍

	Implemented during summer 2014 with at least partial SSA support or funding	Implemented during summer 2014 without SSA support or funding	Planned, but not implemented in summer 2014	Did not take place	I don't know
Financial or physical resources					
Physical study space provided	❍	❍	❍	❍	❍
Financial support for books, supplies, etc.	❍	❍	❍	❍	❍
Financial assistance (including tuition or fee waivers or stipends)	❍	❍	❍	❍	❍
Enrollment incentives (please describe below)	❍	❍	❍	❍	❍
Other (Please specify):	❍	❍	❍	❍	❍

Please use this space to add any clarifying information, as needed.

Summer 2014 Curriculum Development, Planning, Professional Development, and Infrastructure Enhancements

	Implemented during summer 2014 with at least partial SSA support or funding	Implemented during summer 2014 without SSA support or funding	Planned, but not implemented in summer 2014	Did not take place	I don't know
Curriculum Development					
Curriculum alignment with K-12 institutions	❍	❍	❍	❍	❍
Curriculum alignment with 4-year institutions	❍	❍	❍	❍	❍
Collaborative course design with interdisciplinary faculty	❍	❍	❍	❍	❍
Development/revision of STEM credit course(s) (e.g., Intro to STEM, BIO101, CHEM101)	❍	❍	❍	❍	❍
Development/revision of developmental math course(s)	❍	❍	❍	❍	❍
Development revision/of dual-enrollment course(s)	❍	❍	❍	❍	❍
Other (Please specify);	❍	❍	❍	❍	❍

	Implemented during summer 2014 with at least partial SSA support or funding	Implemented during summer 2014 without SSA support or funding	Planned, but not implemented in summer 2014	Did not take place	I don't know
Planning, Professional Development, and Infrastructure Enhancements					
Professional development for STEM faculty advisors	❍	❍	❍	❍	❍
Professional development for STEM faculty instructors	❍	❍	❍	❍	❍
Infrastructure enhancements (Please describe below)	❍	❍	❍	❍	❍
Other (please specify):	❍	❍	❍	❍	❍

Please use this space to add any clarifying information, as needed.

2. Some sites are using SSA funds to support multiple summer programs. Please help us understand the different types of SSA summer programs at your institution by indicating the kinds of activities included in each program in the table below. Fill in as many lines as you need.

Interest activities are designed to get students interested in and boost their awareness of STEM careers and academic programs. These may include field trips, speakers, and hands-on activities.

College readiness activities are designed to prepare students for college. These activities may include test prep, refresher courses, or "boot camps" to boost placement exam scores and may also include college success courses. However, they do not include college-credit, developmental, or dual enrollment coursework.

Coursework includes college-credit, developmental, and dual-enrollment courses.

On the following pages, you will have an opportunity to tell us more about each of these programs.

	Interest Activities	College Readiness Activities	Coursework
Program 1 (Please enter name):	❑	❑	❑
Program 2 (Please enter name):	❑	❑	❑
Program 3 (Please enter name):	❑	❑	❑
Program 4 (Please enter name):	❑	❑	❑
Program 5 (Please enter name):	❑	❑	❑
Program 6 (Please enter name):	❑	❑	❑
Program 7 (Please enter name):	❑	❑	❑
Program 8 (Please enter name):	❑	❑	❑
Program 9 (Please enter name):	❑	❑	❑
Program 10 (Please enter name):	❑	❑	❑

SKIP LOGIC: The following questions, marked with an *, loop through for each of the programs for which data was entered above.

*3. Who attended *Name of program*?

❑ Current community college students
❑ Recent high school graduates
❑ Current high school students
❑ Middle school students
❑ Other prospective community college students (Please specify): _____
❑ Other (Please specify): _____

*4. Please briefly describe the following elements of *Name of program*:

*a) What were the goals of *Name of program*?

*b) How did you measure or track progress toward these goals?

*c) What was the schedule and length of *Name of program*?

*d) How many students:
applied for *Name of program*?
did you accept into *Name of program*?
enrolled in *Name of program*?
completed *Name of program*?

*e) Did *Name of program* focus on particular majors or industries? Which ones?

*f) Was there a cost to students to attend *Name of program*? If yes, how much did participants pay?

*g) What kind of financial assistance, if any, was available to participants in *Name of program*?

*5. Which of the following groups were involved in implementing *Name of program*?
- ❑ Faculty members
- ❑ Current community college students
- ❑ Industry representatives
- ❑ Alumni
- ❑ Community members
- ❑ Other (please specify): _____

SKIP LOGIC: For each program loop, the following questions will be asked depending on answers to Q5, above.

Answer If 5. Which of the following groups were involved in implementing *Name of program*? Faculty members Is Selected

How were faculty members involved in implementing *Name of program*?
- ❑ in program planning
- ❑ as advisors
- ❑ as classroom instructors
- ❑ as study facilitators/tutors
- ❑ as curriculum designers
- ❑ in curriculum alignment
- ❑ receiving professional development
- ❑ providing professional development
- ❑ as speakers or presenters
- ❑ other (Please specify): _____

Answer If 5. Which of the following groups were involved in implementing *Name of program*? Current community college students Is Selected

How were current community college students involved in implementing *Name of program*?

- ❑ in program planning
- ❑ as mentors
- ❑ as study facilitators/tutors
- ❑ as speakers or presenters
- ❑ other (Please specify): _____

Answer If 5. Which of the following groups were involved in implementing *Name of program*? Industry representatives Is Selected

How were industry representatives involved in implementing *Name of program*?

- ❑ in program planning
- ❑ in curriculum alignment
- ❑ as field trip hosts
- ❑ on an advisory committee/board
- ❑ as mentors
- ❑ as speakers or presenters
- ❑ as classroom instructors
- ❑ other (Please specify): _____

Answer If 5. Which of the following groups were involved in implementing *Name of program*? Alumni Is Selected

How were alumni involved in implementing *Name of program*?

- ❑ in program planning
- ❑ in curriculum alignment
- ❑ as field trip hosts
- ❑ on an advisory committee/board
- ❑ as mentors
- ❑ as speakers or presenters
- ❑ as classroom instructors
- ❑ as study facilitators or tutors
- ❑ other (Please specify): _____

Answer If 5. Which of the following groups were involved in implementing *Name of program*? Community members Is Selected

How were community members involved in implementing *Name of program*?

- ❑ in program planning
- ❑ in curriculum alignment
- ❑ as field trip hosts
- ❑ on an advisory committee/board
- ❑ as mentors
- ❑ as speakers or presenters
- ❑ as classroom instructors
- ❑ as study facilitators or tutors
- ❑ providing professional development
- ❑ other (Please specify): _____

Answer If 5. Which of the following groups were involved in implementing *Name of program*? Other (please specify): Is Selected

How were *Name of group mentioned in "other"* involved in implementing *Name of program*?

- ❑ in program planning
- ❑ as advisors
- ❑ as classroom instructors
- ❑ as study facilitators/tutors
- ❑ as curriculum designers
- ❑ in curriculum alignment
- ❑ receiving professional development
- ❑ providing professional development
- ❑ as speakers or presenters
- ❑ in curriculum alignment
- ❑ as field trip hosts
- ❑ on an advisory committee/board
- ❑ as mentors
- ❑ other (Please specify): _____

SSA Summer 2014 Program Elements

6. Please mark the elements that were included in one or more of your 2014 SSA summer program(s) in the following tables.

SSA Summer 2014 Career and Program Exploration Activities

	Implemented during summer 2014 with at least partial SSA support or funding	Implemented during summer 2014 without SSA support or funding	Planned, but not implemented in summer 2014	Did not take place	I don't know
STEM hands-on experiences	❍	❍	❍	❍	❍
Career exploration oriented field trip(s)	❍	❍	❍	❍	❍
Career exploration oriented speaker(s)	❍	❍	❍	❍	❍
Student access to career exploration software	❍	❍	❍	❍	❍
Career-exploration internships (Paid)	❍	❍	❍	❍	❍
Career-exploration internships (Unpaid)	❍	❍	❍	❍	❍
Academic program exploration (Please describe below)	❍	❍	❍	❍	❍
Other (Please specify):	❍	❍	❍	❍	❍

Please use this space to add any clarifying information, as needed.

SSA Summer 2014 College Readiness Activities

	Implemented during summer 2014 with at least partial SSA support or funding	Implemented during summer 2014 without SSA support or funding	Planned, but not implemented in summer 2014	Did not take place	I don't know
Refresher courses before placement test (e.g., math boot camp)	❍	❍	❍	❍	❍
Accuplacer testing	❍	❍	❍	❍	❍
Accuplacer test prep	❍	❍	❍	❍	❍
STEM-based college success skills workshops/course	❍	❍	❍	❍	❍
Other (Please specify):	❍	❍	❍	❍	❍

SSA Summer 2014 Academic Activities

	Implemented during summer 2014 with at least partial SSA support or funding	Implemented during summer 2014 without SSA support or funding	Planned, but not implemented in summer 2014	Did not take place	I don't know
STEM contextualized	❍	❍	❍	❍	❍
STEM project-based learning	❍	❍	❍	❍	❍
Self-paced with faculty/embedded tutors	❍	❍	❍	❍	❍
Computer-based curriculum	❍	❍	❍	❍	❍
Other (Please specify):	❍	❍	❍	❍	❍
STEM dual-enrollment courses	❍	❍	❍	❍	❍
STEM credit courses (e.g., Intro to STEM, BIO101, CHEM101)	❍	❍	❍	❍	❍
Collaborative learning	❍	❍	❍	❍	❍
Experiential learning	❍	❍	❍	❍	❍
Research experience	❍	❍	❍	❍	❍
Learning communities	❍	❍	❍	❍	❍
Other (Please specify):	❍	❍	❍	❍	❍

Additional SSA Summer 2014 Program Elements

For questions 7-10, please provide brief (1-5 sentence) responses.

7. Did you require students to participate in any support services/activities as part of summer programming? If so, what activities? Were support activities/services adapted to meet the needs of your target populations? If so, how? How were these services incorporated into the structure of your summer program(s)?

8. Did you design activities or supports to help students build relationships with other students (including attempts to create a sense of cohort cohesion among your SSA students)? If so, how did you do this?

9. Did you design activities or supports to help students build/strengthen relationships with faculty and/or staff? If so, how did you do this?

10. Did your college promote transfer awareness and readiness in STEM fields through SSA this summer? If so, how did you do this?

Reflections on SSA summer 2014 activities

11. What were some of your college's key successes with SSA this summer? What factors facilitated those successes?

12. What challenges did your college face with SSA this summer? What strategies were used to address those challenges?

13. What lessons did you take away from your institution's summer SSA activities? What activities will you repeat next year? What will you do differently?

14. Does your institution have plans for retaining (or remaining engaged with) SSA students from summer to fall? Please briefly describe those plans.

15. Are there compelling stories of student experiences or successes with your SSA programs or activities that you would be interested in sharing with DHE? Please briefly describe.

16. Do you have other comments about your summer 2014 SSA activities that would inform the evaluation of this initiative?

17. Do you have any other comments about SSA for DHE or the evaluation team?

Thank you for completing this survey!

We will work to package and send your responses back to your institution in a timely manner so you can use this data for your internal evaluation processes as well as for your year-end report to DHE.

If you have any questions about the STEM Starter Academy evaluation, you can contact Jeremiah Johnson (jjohnson@donahue.umassp.edu or 774-455-7377) or Jackie Stein (jstein@donahue.umassp.edu, 413-587-2409).

SUBMIT

DATA DICTIONARY:
STEM Starter Academy Activity

Release 3.0

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

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 included in the count of secondary STEM Starter Academy participants reported by your college in spring or summer 2014, 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 included in the count of secondary STEM Starter Academy participants reported by your college during spring or summer 2014, but not previously reported as a primary participant?

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 summer term 2014 to the beginning of intersession (January) 2015?	
How many TOTAL participants took part in secondary STEM Starter Academy events/activities from the end of summer term 2014 to the beginning of intersession (January) 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. [if not discussed above] Tell me about what is happing with the students who have already been served by SSA.
   - Probes:
     - How is your SSA program remaining engaged with these students?
     - 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.

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?

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, DHE Interview, 1-6-2015

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 1. 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. The interview questions are intended to encourage critical reflection.
- Findings from this interview will be included in our Year 1 Annual Evaluation report, and possibly other products from the evaluation. Since you are our only DHE interviewee, 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 first 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 first 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?
    - Are there additional needs or challenges that you anticipate on the horizon?
3. From your perspective, what has worked in terms of DHE's efforts to support the implementation of the SSA initiative?
4. What challenges has DHE faced in terms of supporting the implementation of the SSA initiative?
5. What key decision points did DHE face during year 1 in terms of providing program support and facilitation?
6. 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?
7. In addition to what we just discussed, what changes, if any, did DHE make from its original plans for the SSA initiative during year 1, and why? Did the changes have their intended effect? Have there been any surprises?

Reflections on Sites

8. 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?
9. 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?
10. Have there been any important recent developments at any of the SSA sites that the evaluation team should know about?

MEMO

TO: David Cedrone, Massachusetts Department of Higher Education

FROM: Jeremiah Johnson and Jacklyn Stein, UMass Donahue Institute

DATE: 4/29/2014

RE: STEM Starter Academy: Promising Practices for STEM Programs in Community Colleges

The following document, "STEM Starter Academy: Promising Practices for STEM Programs in Community Colleges," was prepared by the UMass Donahue Institute for the Massachusetts Department of Higher Education (DHE) as a resource for community colleges participating in the STEM Starter Academy (SSA) initiative. The document provides brief references to some of the promising practices highlighted by the literature to promote community college student engagement, retention, progress, and graduation in STEM fields. The document includes an annotated bibliography that directs readers to additional resources.

The Donahue Institute is working with DHE to evaluate the SSA initiative and provide technical assistance to DHE and the SSA program sites. This document serves as a form of technical assistance, supporting community colleges in their efforts to build upon, codify, and extend system-wide best practices that undergird student progress through and completion of STEM curricular pathways. It is our intention that this document will continue to be modified, as the SSA initiative takes shape, to better meet the needs and reflect the practices of SSA participants.

STEM Starter Academy: Promising Practices for STEM Programs in Community Colleges

The STEM Starter Academy (SSA) initiative aims to build a model for student success in community college STEM programs by supporting community colleges in their efforts to build upon, codify, and extend system-wide best practices that undergird student progress through and completion of STEM curricular pathways.

This document is intended to provide a collection of innovative, evidence-based strategies that STEM Starter Academy colleges can use as springboards for collaborative investigation and conversation as they flesh out system-wide practices for STEM student success. Although not exhaustive, it captures some of the promising practices highlighted in the literature for community college student engagement, retention, progress, and graduation in STEM fields. This is a living document that will be modified, as the SSA initiative takes shape, to better meet the needs and reflect the practices of SSA participants.

In particular, this resource was developed to support three SSA goals, as mentioned in the Request for Proposals from the Massachusetts Department of Higher education, helping 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;”
- “engage in partnership with other campuses to assess, qualify, articulate and codify ‘best practices’ for student support services and activities;” and
- “refine the definition and implementation of the STEM Starter Academy as a model of student success across Massachusetts community college system.”

The practices included in this document were selected based on their potential utility to the Massachusetts community colleges participating in the SSA initiative. They were drawn from a range of sources including academic papers, evaluation reports, and conference proceedings. Evidence is still being gathered on the efficacy of many of these practices. To learn more about the evidence supporting any of the practices described here, please refer to the cited sources.

Contents

* This document is meant to be a long-form reference, and therefore, we have not provided an abbreviated executive summary. However, at the beginning of each Promising Practice section, there is a brief summary of the practices highlighted in that section.

Outreach and Recruitment

This section highlights two general groups of practices: providing information and exposure to STEM pathways to students who might not have considered these options, and helping high school students prepare for and enroll in community college STEM programs by providing enrollment outreach and enhancing dual enrollment.

Provide information about and exposure to STEM pathways

- **Directly address affordability and feasibility during recruitment**. These are primary concerns of students and parents (Mattis & Sislin, 2005). When offering information about STEM programs, also offer information about financial aid, child care, academic supports, and internship and apprenticeship opportunities (Costello, 2012).
    - Help students and parents understand the net price – the published price minus grant aid, scholarships, loans, tax credits, and deductions – that students actually pay. Research suggests that lack of knowledge about college costs, perceived lack of financial aid availability, and debt aversion contributes to the low number of minority and low-income students in college (Kruse et al., 2012).
- **Provide exposure to STEM-related career and transfer options**. Community college (CC) students are more likely than 4-year college students to not have been exposed to the array of occupational choices available within STEM fields (Boroch & Hope, 2009; Hagedorn & Purnamasari, 2012).
- **Provide opportunities for students to interact with role models with whom they can relate.** Examples include alumni from students' own communities or other students a step ahead of them in their education who can discuss challenges they overcame. Interactions with familiar role models can effectively motivate students to enroll, persist (Packard, 2012; Packard & Hudgings, 2002), and transfer (Mery & Schiorring, 2011).

Reach out to high schools to help students navigate the CC enrollment process

- **Embed CC outreach in high schools (HS)**. For example: provide admission, enrollment, and financial aid services at high schools, or have scientists and college science students visit HS classrooms (Dimitriu & O'Connor, 2004; Mattis & Sislin, 2005; Packard, 2012).
    - Personalize recruitment efforts. For example: hold workshops led by faculty and scientists who are women or people of color (Costello, 2012).
    - See the example of the "Science Squad" at University of Colorado at Boulder where graduate students in STEM fields visit K-12 classrooms to give interactive presentations or discuss career possibilities (Laursen et al., 2007).
- **Help students understand the importance of placement tests.** Also, help students prepare so they do not test into courses that are mismatched with their actual knowledge (Chaplot et al., 2013).
- **Help HS students address knowledge gaps before they graduate.** CCs can support pre-testing early (in high school) to or re-testing after preparatory/refresher workshops or summer bootcamps. See p.13 in MDC, 2012 for successful example programs.

Case Study: Using Informal Interactions to Expose Students to STEM Career Options

The Expanding Pathways in Science, Engineering, and Mathematics (EPSEM) program at University of California Santa Barbara included "lunch with faculty" and "dinner with scientists" as part of their 2-week residential summer bridge program. Students reported that these activities were useful ways to gain information about different career options. They liked being able to talk directly with research faculty and industry scientists in an informal setting, preferring it to more traditional events such as a guest speaker or getting information from program staff.

(Lenaburg et al., 2012)

Outreach and Recruitment, continued

Enhance Dual Enrollment

- **Tailor location to the needs of your students**. Holding dual-enrollment classes on college campuses (and with a mix of college and high school students) can create a more "authentic" college experience for high school students and give them better access to academic and other support services on campus. However, transportation challenges may close access to some students (Hughes et al., 2012; Packard, 2012).
- **Expand eligibility for dual enrollment beyond those who are already high-performing.** A wider range of students can benefit from dual enrollment. Gaining college credit in HS makes students more motivated to persist (Karp et al., 2008b).
- **Smooth the process of credit transfer.** College credit hours should fulfil state requirements for days and minutes toward HS graduation. State and local districts can lift restrictions so college courses can count toward HS requirements as well as college credit (Hughes et al., 2012; Jobs for the future, 2006).
- **Provide professional development to dual enrollment instructors.** HS teachers may need assistance creating a college-like atmosphere and college instructors may need insight into pedagogical strategies for HS students (Hughes et al., 2012).
- **Identify dedicated CC staff to smooth logistical hurdles for dually enrolled students, especially during registration** (Hughes et al., 2012).
- **Embed college student interns within dual-enrollment classes**. Interns can bridge the gap between the students and professors, help students analyze assignments in small groups, and answer questions that students don't feel comfortable asking the professors. Interns can perform this service as part of their college program's work-based learning requirement (see North Orange County example in Hughes et al., 2012).

Resource Highlight:

The Recruitment and Retention chapter in *Enhancing the Community College Pathway to Engineering Careers* (Mattis & Sislin, 2005) provides examples of how "exemplary practices" for recruitment and retention are being carried out by a range of community colleges that are specifically focused on engineering programs.

Case Study: Dual Enrollment – The Concurrent Courses Initiative

A three-year study of career-focused dual-enrollment programs at 10 California community colleges and 21 high schools

- Dual-enrollment students at City College of San Francisco (CCSF) attend day-long orientations at the CCSF campus and receive half a college credit for their participation. Students hear from guest speakers, meet with a counselor, tour the campus, and receive information about textbooks and other logistical matters.
- At CCSF, a program counselor visits the first session of each course, holds weekly office hours on each campus, and uses social media to keep students abreast of ongoing activities. She sends out frequent text messages and emails to remind students about important dates and to encourage them to study for exams.
- North Orange County, California created "Counseling 150: Academic and Life Success," which packages academic, behavioral, and personal supports within the same college-credit-bearing course – an effective way to include lower-achieving students in dual enrollment, helping to ease them into more academically rigorous courses.

(Hughes et al., 2012)

Outreach and Recruitment, continued

Case Study: ACCUPLACER Process at El Paso Community College (EPCC)

The Texas college has seen an increase in the number of students testing as college ready, as well as more students testing into fewer developmental courses, which means less time to credit-bearing courses.

1. Students complete a joint admissions application to EPCC and University of Texas, El Paso.
2. Students and their parents attend a comprehensive orientation about the ACCUPLACER in which they learn about its purpose, how scores are used, how not doing one's best can add time and cost to degree completion, and how to prepare for the exam.
3. Students take the test.
4. Counselors review the test scores with each student.
5. Students not passing all areas of the placement test are given interventions that focus on refreshing skills, and then are retested.
6. Students who still need help may enroll in a summer bridge program.

(Kerrigan & Slater, 2010; MDC, 2012)

Case Study: High Tech Academy at Cuyahoga Community College

High Tech Academy (HTA) is a dual enrollment program in which local high school students attend a half day of school at their home school and then attend classes on the Cuyahoga Community College campus.

Much of the college tuition costs are paid through a state-supported plan, which also allows college-level classes to count toward students' graduation requirements in high school.

The program focuses on computer technology, business and academic core courses. The school district provides a principal, and the College provides a program manager and together they coordinate programming for 200-300 high school students annually.

(Hagedorn & Purnamasari, 2012; Cuyahoga Community College web page)

Examples: Effective Practices for Promoting the Transition of High School Students to College

from a synthesis of consistent findings and recommendations identified through the analysis of the published literature by the Research and Planning Group for California Community Colleges

- **Rigor**: students should engage with academically intense curriculum in high school (not just the high achievers).
- **Relevance**: high school curriculum should be clearly connected to post-secondary education and career opportunities.
- **Alignment**: high school exit requirements should align with college entry requirements.
- **Realistic Expectations**: students and families should have access to accurate and timely information about knowledge, standards, and behaviors necessary for college success.
- **Support for transitions**: academic and non-academic support should be offered to students who are transitioning to a new phase of programming/learning (e.g., summer bridge).[1]

(Boroch & Hope, 2009)

[1] See the Retention section of this document for more on summer bridge.

Retention

This section highlights two broad groups of practices: helping students overcome barriers to college access (by providing non-academic support, financial aid, and transition support); and, supporting students' integration into academic life and STEM fields in particular (through increased STEM relevance, undergraduate research, and socio-academic integration).

Provide non-academic support

- **Reward behaviors that contribute to completion.** Rewards could include acknowledgement (such as a congratulatory email) or incentives such as priority enrollment or even monetary scholarship (Chaplot et al., 2013).
- **Address psychological barriers to success.** Barriers include students' negative self-perception as math learners, doubts about the relevance of the material, and lack of personal connection to classmates and faculty (Silva & White, 2013).

  According to Yeager et al. (2013), academic achievement is improved among students when instructors:

  * Foster a "growth mindset" which frames intelligence as something that can be developed.
  * Create a sense of belonging.
  * Encourage students to see critical feedback as reflective of high standards.
- **Create ways to access programs that meet the needs of working students**.

  For example:

  * **Scholarships that require full-time status may not be realistic for many CC students** (Packard, 2012).
  * **On-site, subsidized child care might help minimize the conflict between family and school.** This is particularly true for female students (Karp and Stacey, 2013a). Drop-in child care options can allow students the flexibility to attend evening and weekend activities and complete homework (Costello, 2012).
  * **Allow students to earn and stack credits over time**. Students whose work or family responsibilities require them to leave and return to college at a later point can still accumulate credits toward a credential and degree (Costello, 2012).
- **Create predictable and streamlined criteria for progress and completion.** Financially needy first-generation college students are much more likely to complete an associate's degree if they attend an institution with reliable class schedules and an easy-to-navigate bureaucracy (Chaplot et al., 2013; Person & Rosenbaum, 2004).

  For example:

  * **Offer "one-stop shopping," where prospective students can enroll, register, and apply for federal financial aid by working with a single person in a single afternoon** (Mattis & Sislin, 2005, p.35).
  * **Offer courses in a regular sequence and at convenient times of the day**. Low-income students are more likely to complete an associate's degree if they can be confident of their access to the courses they need. Students often reported that classes had been canceled at the last minute, or that some of their required courses had been offered at night, but others during the day (Mattis & Sislin, 2005).

Resource Highlight:

WestEd's Game Changer Series publication, "Providing Structured Pathways to Guide Students Toward Completion," provides some concrete and evidence based strategies for creating clear and predictable pathways for students. It is also filled with implementation examples from community colleges across the U.S. (Dadgar et al., 2013a).

Retention, continued

Increase the relevance of STEM to students' lives:

- **Use STEM-specific internships to make work experiences career-relevant.** Seeing the relevance of school learning to a career can motivate students (Packard et al., 2012a).
- **Redesign intro STEM courses to help students see themselves within STEM pathways.** Using interdisciplinary courses, service-learning, and society-relevant materials can help students see STEM careers as more compelling to pursue (Brown et al., 2009; Chamany et al., 2008; Coyle et al., 2006).
  - Example: One-minute descriptions of future careers at the beginning of class (Packard, 2011).
- **Increase social-contextualization of remedial or developmental courses** (Hulleman & Harackiewicz, 2009).
- **Partner with industry to pose problems that students can solve collaboratively.** This encourages relationship building and helps to make a clear link between academic success and future job prospects (Kisker & Carducci, 2003).

Resource Highlight:

See Salm et al. (2008) for an example of a 5-week undergraduate biology research summer program at a community college.

Case Study: Undergraduate Research Experience

The University of Oregon's Undergraduate Catalytic Outreach and Research Experiences (UCORE) program brings community college students to campus for a 10-week summer research residency. Students return to their community college campuses for a follow up year of outreach and service learning – acting as role models for their peers and helping to shift the learning environment of their departments.

(Strawn & Livelybrooks, 2012)

Support undergraduate research

- **Undergraduate research improves academic outcomes, and encourages students to pursue science careers** (Gregerman, 2008; Hathaway et al., 2002; Jones et al., 2010; Lopatto, 2004; Russell et al., 2007; Seymour et al., 2004).
- **Research experiences also have positive secondary effects** on peers when returning students act as role models and tutors (Strawn & Livelybrooks, 2012).
- **Integrate research into the classroom** (American Association for the Advancement of Science, 2011).
- **Use inquiry-based course designs to replicate the process and excitement of research** (Brown et al., 2009).
- **Develop time-flexible research programs or funded research so CC transfer students have opportunities similar to those of 4-year students to participate in undergrad research.**
  - Paid research experiences can have the added benefit of helping students defray some college expenses while complementing and enriching students' learning (Tsui, 2007).
- **Create opportunities for students to publicly present research.** Student who present results from summer research experiences increase both confidence and communication skills (Lenaburg et al., 2012).

Resource Highlight:

The Council on Undergraduate Research has several resources to help community colleges integrate undergraduate research into community colleges. (www.cur.org)

Retention, continued

Increase socio-academic integration

- **Facilitate teacher-student and student-student interactions *in the classroom.*** CC students cite interactions in the classroom, and with institutional actors (such as faculty, staff and other students) as important contributors to their sense of comfort and integration in the college environment (Deil-Amen, 2011; Karp et al., 2008a).
- **Facilitate student participation in academic and social information networks**. CC students in particular benefit from relationships they build with peers in class. These relationships can be used to access information and often extend to social activities outside of the classroom (Karp et al., 2008a).
- **Offer course sequences taught by the same faculty member**. Students may develop stronger connections with faculty who teach a sequence of courses in consecutive semesters, such that students can follow that instructor as a cohort (Delcham et al., 2009).
- **Create opportunities for students to develop social connections related to their academic work** (e.g., collaborative in class work, study groups, scholar cohorts) (Karp, 2011).
- **Offer learning communities that involve special advising and interdisciplinary course planning**. Such communities can be successful in helping students pass developmental math courses and feel more socially integrated (Hodara, 2013; Packard, 2012; Scrivener & Coghlan, 2012).
- **Provide opportunities for those who participate in summer bridge programs to remain connected.** Once other students arrive on campus, the benefits of summer bridge programs may fade as "cohorted" students feel increasingly "on their own" (Strayhorn, 2012).
- **Pay attention to classroom climate.** Students reported that classroom climate (including their anxiety levels, how welcome they felt in class, how well supported they were by instructors, and instructor rapport with students) significantly influenced their decisions to stay in or leave STEM disciplines (Brown et al., 2009).

Case Study: Using Technology to Assist with Socio-Academic Integration

The Regional Center for Next Generation Manufacturing (which prepares students in Connecticut's 12 community colleges for STEM careers) uses a Facebook page with chat rooms where students can communicate with each other about school projects and connect with mentors from industry and professional associations to ask questions.

(Costello, 2012)

Case Study: Cultivating a Sense of "Belonging" among Under-Represented Students in STEM

"Faculty members knew [students'] name[s], demonstrated an interest in their degree or professional goals, and seemed to care about their mastery of STEM course content. … What students took away from these encounters was a sense of mattering, feeling appreciated, cared about, and special in some way. These experiences seemed particularly meaningful for students who might otherwise have felt marginalized, unprepared for, or 'out of place' in STEM fields (e.g., women, people of color)."

(Strayhorn, 2012, p.69)

Retention, continued

Ease the transition into college

- **Teach college navigation skills.** These skills include time management, study skills, how to access financial aid, how to find internships, what various grades and credits mean, how to access tutoring services, and soft skills to meet the unspoken cultural expectations of both the college and future employers (Karp, 2011).
- **Consider making college skills courses mandatory.** However, remember that students are wary of mandatory services, and that "if a service is mandatory, [students] want it to be of high quality, engaging, and clearly connected to their plans and goals" (Nodine et al., 2012, p.1; see also Chaplot et al., 2013; Dadgar et al., 2013a; Scrivener & Coghlan, 2012).
- **Facilitate the development of problem-solving skills in both academic and advisory settings** (Urias et al., 2013). For example, counselors can emphasize the importance of identifying and evaluating potential courses of action and faculty can provide students with choices of assignments, groups, or lab dates.
- **Create structured pathways that help students navigate the many choices they have to make when they first enter CC**. For some suggested strategies, see Dadgar et al., 2013a.
    - Students who identify clear educational goals early on are less likely to drop out (Summers, 2003).
- **Help students complete developmental coursework.** Developmental math course completion is correlated with student retention (Fike & Fike, 2008). See the *Developmental Education* section of this document for more resources.
- **Offer multiple forms of mentorship.** Students are more likely to persist in STEM when they experience both socio-emotional mentoring such as role modeling or encouragement *and* instrumental mentoring such as academic support, or college and career coaching (Packard, 2004-2005; Starobin, 2004). >>

Resource Highlight:

The Community College Research Center has several publications with evidence-based suggestions on the most effective mechanisms of non-academic student support. (http://ccrc.tc.columbia.edu/)

Examples: Designing Student Success Courses for Sustained Impact

- **Narrow course content** to cover fewer topics in greater depth.
- **Make more strategic staffing choices** to ensure that teaching in success courses promotes learning-for-application. For example: using disciplinary faculty to teach student success courses would help to bridge the divide between academic courses and student success courses.
- **Teach for application** and sustained practice (e.g., use problem solving activities).
- **Develop common course assignments** geared toward reflection, application, and practice.
- **Reinforce student success** learning objectives in academic courses.
- **Integrate student services functions** to build and sustain students' progress toward specific student success learning objectives.

(Karp & Stacey, 2013c)

Retention, continued

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- **Summer bridge programs between high school and college may help students transition into college**. Bridge programs may also improve retention and academic success. However, there is still little empirical research on what elements of these programs lead to success (Sablan, 2013; Tsui, 2007).
  - For a recent review of the research on summer bridge programs, see Sablan, 2013.
  - For evaluations of existing summer bridge programs, see Barnett et al., 2012 and Lenaburg et al., 2012.
  - For some promising practices related to summer bridge programs, see Boroch & Hope, 2009 (pp.29-36 and 52-53).
  - For more information on engaging faculty in curricular innovation for summer bridge programs, see Goldfien & Badway (2014).

Offer Financial Aid:

- **Provide performance based scholarships**. In addition to regular financial aid, these can enhance academic performance (Scrivener & Coghlan, 2012), but it is not clear if performance based scholarships enhance persistence or completion.
- **Provide scholarships for students who follow STEM pathways** (Dowd, 2012).
- **Provide financial aid counseling.** Help ensure that students apply for and receive all of the aid to which they are entitled (Costello, 2012). Money is often a factor in attrition (Dowd & Coury, 2006; Hagedorn et al., 2001-02; King, 2002; Paulsen & St. John, 2002).
- **Support policy to increase financial aid for STEM students at community colleges** (see Costello, 2012 for recommendations).

Resource Highlight:

MDRC is running a performance-based scholarship demonstration.

See interim results at their site: (http://www.mdrc.org/project/performance-based-scholarship-demonstration#design_site_data_sources)

Examples: Strategies for Reducing the Financial Burden of College

- Loan-to-own computer programs for students with certain GPAs – laptop computers to loan that can become the student's upon completion of a certain degree.
- Emergency funds for books, transportation, and college fees to support students to stay in school when financial hardships arise.
- Employ students as peer tutors.
- Partner with industry for scholarships, summer jobs, internships, and research experiences.

(Costello, 2012)

Advising

This section highlights a few practices: creating ongoing, "intrusive," and transparent advising; engaging faculty in advising, integrating advising into academic work; and, using technological tools to better monitor student progress.

Use Sustained, Strategic, Personalized Advising

- Personalized, sustained advising has better long-term outcomes than short-term intensive advising (Bettinger, 2012; Karp & Stacey 2013b).
- **Continually monitor student progress and regularly give feedback**. Use regular outreach and tracking to acknowledge milestones or hurdles rather than only checking in once a student has already missed a deadline or is failing (Chaplot et al., 2013).
- **Mandate student engagement in a range of student support activities.** Mandating engagement "shifts the responsibility of asking for help away from those who are already struggling most and towards the college that knows which supports can benefit all students" (Chaplot et al., 2013, p.25).
- **Reach students early**. Students who take 40% or more of their first-term coursework in STEM are more likely to persist in STEM majors (Bettinger, 2012).
- **Provide transparency and structure**. It is understood that "students do best with clarity, transparency, and structure. Their faculty and staff advisors should be on the same page to provide a unified learning experience. In addition to clear start and end points, structured programs have fully transparent sequences of courses, including identified prerequisites, so that students know what classes to take and when to take them in order to reach the end goal" (Rassan et al., 2013b).

Examples: A Sustained, Strategic, Intrusive, and Personalized Advising Model

- Integrate academic and career advising.
- Integrate face-to-face and e-advising systems.
- Provide services to students based on their level of need.
- Strategically deploy resources to allow for developmental advising over time.
- Integrate metacognitive skill-building practice into academic courses – joining advising and teaching.

(Karp & Stacey, 2013a and 2013b)

Examples: Provide Proactive "Intrusive," Ongoing Support

Examples of proactive supports include:

- Requiring all students to update educational plans periodically.
- Identifying students who are not making progress toward a degree and offering advisement and other services to guide them in course-taking.
- Identifying students who are at risk of failure in a class and requiring them to attend tutoring sessions.
- Contacting students who have left the college, inviting them to return, and showing them how to do so.
- Offering internships and other services to help students learn about careers and how to connect with employers.

(Dadgar et al., 2013a)

Advising, continued

Use online resources to monitor student progress

- **Strategic advising with the help of online systems can help students stay on track while conserving advising time and the college's financial resources** (Chaplot et al., 2013; Karp & Stacey, 2013a).
  - Online systems can provide frequent and easily accessible opportunities for students to assess their progress toward their goal of choice. For example, an online system can send an email alert to students who complete one level of math but do not enroll in another (Hagedorn & Dubray, 2010).
  - See the example of Tacoma Community College's online advising "dashboard" and the way it helps facilitate faculty and staff collaboration as well as student monitoring (Focusing on Student Success, 2010).
  - MentorNet, for example, has been effective at sustaining STEM career interests by providing access to industry career professionals (Packard, 2003b).

Case Study: Online Advising at Santa Fe College in Florida

Students use two online systems to gain a better understanding of each step toward their educational goal. First, students work with college personnel to create an electronic educational plan. They then use the Degree Audit system to track progress toward their goal. Students are also required to look at Degree Audit before registering for classes each semester and the combination of these two programs lets students know:

- Exactly what courses are needed for which programs;
- When a course they have selected is not part of their plan and will not count toward financial aid eligibility;
- Whether specific courses will count toward transfer to various four-year schools; and,
- How to build a schedule that both supports their plan and responds to their particular preferences.

Through these systems, students are aware at all times of their progress toward identified goals and are able to make adjustments as needed. The college is also able to offer positive feedback to students as they achieve certain milestones; for example, students who complete the developmental education sequence receive an email congratulating them on their achievement.

(Chaplot et al., 2013)

Case Study: Advisor Data Portal at Walla Walla Community College

The online Advisor Data Portal houses a wealth of information about each student that used to be scattered in various places (e.g., placement scores, grades, educational plans, and warning flags for poor performance or attendance). Members of student services and information technology staffs meet weekly and have collaboratively designed many tools to improve student completion. A degree estimator, for example, automatically maps students' transcripts against program requirements to determine how close they are to completion. Notices go out to students near a credential – even if they are no longer enrolled – and they are offered a bookstore gift certificate if they talk with a counselor, who helps get them back on track.

(Aspen Institute, 2013)

Advising, continued

Integrate instruction and student support services

- **Build supports such as advising and study skill building directly into the classroom** (Chaplot et al., 2013).
  - Students are more likely to take advantage of support systems if they are integrated into their academic experiences rather than something they have to actively and separately seek out (Chaplot et al., 2013; Dadgar et al., 2013b).
  - Without integrated support, it is often the students who already know how to navigate college systems who take advantage of these resources (Dadgar et al., 2013b).

Case Studies: Integrating Instruction and Student Support Services

At Highline Community College in Seattle, students who are enrolled in Engineering 101 also learn about required courses for transfer, financial aid, and support services available for them. During the course, students develop a two-year plan to map an academic path to transfer (Starobin & Laanan, 2008).

At Florida's Valencia College, developmental education instructors team-teach with Student Success instructors a semester-long course in which students create personalized educational plans and develop organizational skills. In addition, many developmental education faculty members are integrating study skills into all of their courses (Chaplot et al., 2013).

- **Create incentives and opportunities for faculty and support services staff to collaborate.**
  - Faculty and support services staff can participate in common professional development activities (Dadgar et al., 2013b).
  - Online progress-monitoring systems can help faculty and support staff better coordinate their work. For example, Tacoma community College's online "Dashboard" system allows faculty and staff to share notes on student's progress, document advice the student has received, and alert each other when they have concerns about a student (Focusing on Student Success, 2010).
  - Valencia College has created "reading circles" where faculty and staff gather to read and discuss the most recent literature in the field (Dadgar et al., 2013a).
  - Santa Barbara City College provides an interesting case study, where academic and student support functions are integrated into a single unit (Dadgar et al., 2013a).

Resource Highlight:

WestEd's Game Changer Series Report, "Integrating Student Support Services and Academics" provides concrete, evidence based strategies as well as implementation challenges (Dadgar et al., 2013b).

Examples: Integrating Academic Instruction and Student Support

- Faculty and advisors can co-teach some parts of the curriculum or can teach "paired" academic/student success courses to a cohort of students.
- Tutors can be scheduled to help students with assignments during class time, or scheduled meetings with tutors can be part of required class time.
- Designate faculty advisors within STEM disciplines: faculty can provide info about academic requirements, make discipline-specific referrals, and provide students with advising consistency.
- Advisors can be embedded in classrooms to work on educational and career planning.

(Dadgar et al., 2013b)

Advising, continued

Engage STEM faculty in formal and informal advising:

- **Facilitate student access to faculty.** Faculty approachability and accessibility have a direct impact upon student perceptions of self-efficacy, which directly influence GPAs, academic confidence, and retention rates (Deil-Amen, 2011; ENGAGE, n.d.). Faculty are also in a good position to give discipline-specific advice to STEM majors (Dowd, 2012).
- **Help faculty improve their interactions with students.** One of the strongest predictors of student engagement and persistence in STEM fields is the quality and type of interactions with faculty (Amelink & Creamer, 2010; American Society for Engineering Education, 2009; Kim & Sax, 2009; Ohland et al., 2008; Thompson, 2001; Vogt, 2008).

  Promising practices for approachability:

  * Use students' names, use small group office hours, and invite questions in writing during class (Packard, 2011).
  * Give constructive feedback. Faculty expectations influence student performance (Packard, 2011; Yeager et al., 2013). Also, clearly explain the connections between feedback and ability, so students can more accurately evaluate their performance (Brown et al., 2009).
  * Positive student learning outcomes are correlated with faculty discussion with students about the nature of engineering work and affirmation of students' abilities to successfully perform such work (ENGAGE, n.d.).
  * Small, casual interactions – such as a conversation after class – can make a difference in student persistence and also save time in office hours (Amelink & Creamer, 2010).
- **Encourage faculty to embed advising into the classroom.** Using classroom time allows faculty to reach more students while conserving time (although one-on-one advising is still very important).
  * For example, in a few minutes per class, faculty can incorporate discussion of content needed for 4-year transfer, give motivational pep talks and strategies for adjusting to 4-year college, explain the value of attending a 4-year institution, discuss career possibilities, or advertise transfer office resources and programs (Packard, Tuladhar, & Lee, 2013).
- Faculty might express concerns over the additional burden of advising, but at institutions where it has worked best, faculty are not expected to engage in intensive advising, but instead to be the first point of contact and know enough about support services to refer students successfully (Dadgar et al., 2013a).

Resource Highlight:

For tips on improving faculty-student interaction, see the ENGAGE website: http://www.engageengineering.org/?page=138.

Case Study: Engage Faculty in Advising

At Valencia College, faculty members receive training on the various campus services that are available, and adjunct faculty members are given monetary incentives to complete relevant training certifications. The certification process involves taking required modules on topics such as how to advise developmental education students and how to promote college success skills. There are also elective courses on topics such as how to motivate students and how to promote student development of affective skills.

(Dadgar et al., 2013a)

Developmental Education

This section highlights ways to help students avoid "stalling out" in developmental coursework. Strategies include curricular redesign that involves contextualization and addresses psychological barriers, as well as the provision of ongoing, collaborative support that de-stigmatizes help-seeking behavior.

Support the development of engaging curricula

- **Explore alternative formats for delivering developmental mathematics curricula**.
  - **Adapt curriculum to address socio-emotional and psychological barriers to math**. See Silva & White, 2013 for an example.
  - **Create contextualized coursework**. Allow students to earn credits toward transfer while learning basic skills. See Baker et al., 2009 for a faculty primer on contextualized teaching and learning. Also see Goldfien and Badway, 2014 for lessons learned regarding engaging faculty in the process, and Perin, 2011 for a review of the evidence supporting contextualization.

    Contextualization is "the practice of systematically connecting basic skills instruction to a specific content that is meaningful and useful to students," in this case, STEM content (Perin, 2011, p.270).
  - **Focus on demonstrated competencies instead of seat time**. Use a modular approach that targets specific skills and competencies. Provide remediation and college level course work simultaneously (Chaplot et al., 2013).

    With modularization, students to take short, focused "modules" instead of semester-long courses, allowing for multiple entry and exit points (Bragg, 2012).

    The SMART math program at Jackson State Community College is an example of a modularized design (http://www.thencat.org/SMART%20Math%20at%20JSCC.htm).
- **Invest in faculty professional development to help create more engaging courses** (Goldfien & Badway, 2014).
  - The Developmental Education Initiative found that it was more cost-effective to bring experts to their campuses for intensive trainings, and engaged many more faculty and staff, than the "go to the conference and bring something back for us" approach (MDC, 2012, p.23).
- **Facilitate substantive collaboration between basic skills instructors and discipline-specific instructors.** Developmental education courses can effectively use disciplinary context to enhance student motivation and learning (Perin, 2012).

  Examples:
  - The IBEST program in Washington state **combines basic skills and professional technical education** in co-taught courses (Wachen et al., 2010). Enrollment in IBEST increased college-level credit accumulation and degree or certificate completion (Zeidenberg et al., 2010).
  - At Valencia College, **faculty developed online resources to help students prepare for placement tests** (Dadgar et al., 2013a).

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Resource Highlight:

Read about one group's experience collaborating to create a health-contextualized math curriculum in Shore et al., 2004.

Example: Curricular Innovation for Developmental Education

Science Education for New Civic Engagements and Responsibilities (SENCER) curricula connect scientific knowledge to issues of public concern. La Guardia Community College adapted SENCER approach for their developmental math courses and saw a 34% decrease in their dropout rate (Delcham et al., 2009). For more information, see www.sencer.net and La Guardia Community College's Project Quantum Leap Sampler (2008).

Developmental Education, continued

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- **Offer administrative support for collaboration.** Support in terms of time, scheduling, and funding is crucial to the success of developing contextualized curricula (Goldfien & Badway, 2014).
- **Foster interdisciplinary collaboration among faculty.** Interdisciplinary collaboration – for example between math and physics – can help students align what they learn and make their learning more synchronized and the transitions between topics easier (Delcham et al., 2009).

  For example:

  * A workshop was created to involve faculty from mathematics and nursing to put together a prototype lesson that used problem-based learning and integrated nursing topics. Through this work, the faculty decided to write a FIPSE (Fund for the Improvement of Post-Secondary Education) proposal to more fully develop a contextualized curriculum, which was accepted (Shore et al., 2004).

Resource Highlight:

Learn about the challenges of developing a biotechnology-contextualized summer bridge curriculum in Goldfien & Badway, 2014.

Resource Highlight:

Read about the outcomes of a three-year effort to identify and scale programs that increase the number of community college students who complete developmental education and successfully move on to credit-bearing studies (MDC, 2012).

Provide academic support that is collaborative and non-stigmatizing

- **Offer peer-facilitated study groups**. Provide a review of lectures with prepared interactive material designed to target trouble spots. Design activities to de-stigmatize help seeking behaviors.

  * Uri Treisman's Mathematics Workshop Program provides one of the original successful models for facilitating collaborative academic support (Fullilove & Treisman, 1990).

  * Students who participate in collaborative academic support benefit from improvements in their academic performance and from opportunities to grow into leadership positions (Packard, 2012; Treisman, 1992).

- **Structured collaboration has been shown to improve math preparedness** (Hodara, 2013).
- **Student success centers integrate academic and career counseling in a potentially non-stigmatizing environment**. When organized by topic, rather than developmental level, some of the stigma around help seeking is eliminated. Student success centers are perceived as services that everyone uses, not just those who are struggling academically (Dadgar et al., 2013b).
- **Help students understand and prepare for placement tests** so they will be placed in courses that are a good match for their skills. See p.13 in MDC 2012 for examples.

Case Study: Placement Test Preparation

Housatonic Community College offers a 4-week "prepare for math" lab with individualized instruction (to students who score just below the cut off for the next level course) rather than the typical 16-week version. After the 4-week lab, 50% of students scored higher on retest.

(MDC, 2012, p.21)

Transfer to 4-year colleges

This section highlights two general practices to support transfer: relationship building between CCs and 4-year colleges; and, creating financial, social, and academic support for transfer students at receiving institutions.

Create alignment between levels of education

- **Memos of understanding/articulation agreements between CCs and 4-year institutions are promising, but perhaps not sufficient** (Anderson et al., 2006; Hoffman et al., 2010; Jackson et al., 2013; Kienzl et al., 2011; Kisker, 2007; Mattis & Sislin, 2005).

  Transfer partnerships should include:

  * collaboration between faculty,
  * campus visits by university faculty to community college campuses,
  * joint undergraduate research programs, and
  * financial support for transfer students.

- **Admissions advisors from 4-year colleges can visit 2-year institutions**. Advisors counsel students and parents on admission, prep for STEM majors, financial aid, housing, internships, and other student services. STEM-specific advisors can provide transcript evaluations, seminars on academic and career opportunities in STEM, and guided tours of their university departments (Mattis & Sislin, 2005). See UC Davis "TOP" program as an example (Case Study)

- **Consider block transfer systems.** Giving premium transfer credits for completing an A.S. degree encourages persistence and completion more than course-by-course articulation agreements, which may discourage students from completing the A.S. (Mattis & Sislin, 2005).

- **Give faculty release time to develop new curricular pathways and to align curriculum from developmental studies to content disciplines** (MDC, 2012).

- **Expose students to 4-year institutions, increase the visibility of universities on CC campuses, and provide CC students opportunities to get involved at university campuses** (Jackson & Laanan, 2011; Mery & Schriorring, 2011).

- **Provide professional development and training for faculty advisors who work with transfer students**. Advisors can spark intention to transfer and support transfer goals (Bahr, 2008).

Case Study:
UC Davis Transfer Opportunity Program (TOP)

TOP is a collaboration between the University of California, Davis (UCD), and 15 northern California community colleges. TOP coordinators from the Undergraduate Admissions Office at UCD regularly visit participating colleges to counsel students and parents on admission to UCD; preparation for majors and general education requirements; and financial aid, housing, internships, study abroad, and other student services. Engineering advisors also provide transcript evaluations, seminars on academic and career opportunities in engineering, and guided tours of the UCD campus.

(Mattis & Sislin, 2005, p.23)

Example: Elements of Exemplary Articulation Agreements

According to the National Academy of Engineering and the National Research Council, exemplary articulation agreements offer transfer students per-semester scholarships, allow students to take courses at a community college with financial aid from the four-year institution, and require a single application process and fee for partnering institutions.

(Mattis & Sislin, 2005)

Transfer to 4-year colleges, continued

Foster collaborative relationships between CC faculty and 4 year college faculty

- **Build interpersonal relationships across institutions**. Dowd (2012, p.127) argues that "transfer structures are not sufficient to support robust transfer pathways in STEM in the absence of interpersonal relationships and shared cultural norms across sectors."
- **Involve faculty**. Facilitate regular collaboration between 2- and 4-year college faculty members. Involving faculty is key to fostering a "culture of transfer" on CC campuses (Kisker, 2007).
- **Engage in collaborative activities across institutions**. The National Academy of Engineering and the National Research Council suggest that collaborative activities, such as the joint development of grant proposals and workshops, can also increase the level of cooperation between transfer partners (Mattis & Sislin, 2005).
    - One example is regular lunches between CC and 4-year faculty members that improved their relationships and the transfer of students (Dowd, 2012).
- **Support faculty participation through stipends or release time**. Heavy course loads and other responsibilities may often keep faculty from being more involved, but offering temporal or financial support can create a "mutually reinforcing cycle" where involved faculty can help other faculty think more about assisting students who want to transfer to a 4-year institution (Kisker, 2007).
- **Transfer information between community college and university faculty**. Educate 4-year faculty about the talent at CCs and help CC faculty understand what is needed at the 4-year level (Dowd, 2012).
    - Negative stereotypes about transfer students' ability can impede success (Laanan, 2007), so disseminating information about CC student success to 4-year college faculty, administrators and student affairs staff is critical (Hoffman et al., 2010).
    - Negative attitudes toward transfer students regarding their academic performance contradict research findings showing that the academic abilities of transfer students, including those in STEM fields, are comparable to the academic abilities of non-transfer students (Laanan, 2001).
    - Note that some transfer students who excelled at community colleges may experience transfer shock – a drop in academic performance in their first year of study at a four-year institution (Laanan, 2001).
    - Although community college students are less likely to earn a baccalaureate degree compared to their four-year institution peers, CC students who successfully transfer to a four-year college or university are as likely to earn the bachelor's degree as those who begin at four-year institutions (Handel, 2011).

Resource Highlight:

See NIH's "Bridges to the Baccalaureate" program, which supports institutional partnerships between 2- and 4-year colleges for students studying the biomedical sciences (http://www.nigms.nih.gov/Research/Mechanisms/Pages/BridgesBaccalaureate.aspx).

Transfer to 4-year colleges, continued

Foster support at receiving institutions:

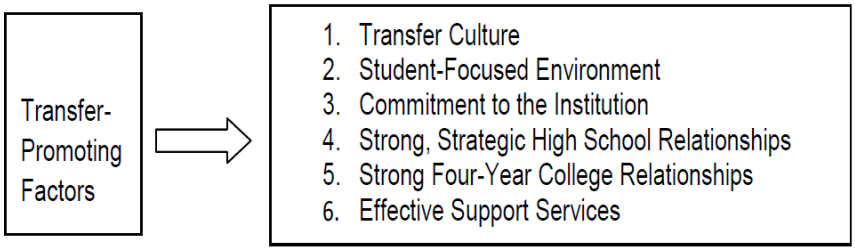
- **Offer orientations specifically designed for CC transfer students**. Transfer students in STEM fields benefit from intentional and comprehensive orientation and mentoring programs oriented specifically to their needs (Townsend & Wilson, 2006).
    - Some schools, like LaGuardia Community College have arranged "joint transfer orientations" where CC students meet with 4-year college deans, financial aid advisors, directors of admission, career placement personnel and chairs of various STEM departments (Delcham et al., 2009).
- **Encourage the assessment of campus climate in STEM learning environments at universities.** Climate issues in STEM programs at 4-year colleges (faculty and peer interactions) have been tied to the disproportionate loss of women and racial minority students from these fields (Dowd, 2012; Walton & Cohen, 2011; and, Walton et al., 2012).
- **Improve talent assessment and identification systems in community colleges.** In short, "poor signaling of student talents and accomplishments hampers transfer rates because the quality of the community college curriculum is viewed with suspicion by university and liberal arts faculty" (Dowd, 2012, p.108).

Offer Financial Support

- **Offer transfer scholarships that are specific to STEM** (Dowd, 2012). Students receiving financial aid are more likely to transfer (Anderson et al., 2006).
- **Encourage students to use individual development accounts**. These savings accounts are matched by public and private sources (Dowd, 2012).
- **Seek federal funding for STEM-specific experiences through work study or internship programs** (Dowd, 2012).
- **Involve industry in identifying mechanisms to provide work-study positions in collaboration with academic institutions** (Dowd, 2012).

Case Study: Six Key Factors Influencing Transfer to Four-Year Colleges

Results from the Successful Transfer Approach Research (STAR) Project
Investigating seven California community colleges with consistently high transfer rates.



(Mery & Schiorring, 2011)

Transfer to industry/career

This section emphasizes the importance to community colleges of building relationships with leaders of local industry. These relationships can help engage students in STEM careers, create internships, and facilitate job placement.

Build relationships with local industry

- **Facilitate regular contact between faculty and representatives from local industry.** Advisory committees are an example. Example: Modesto Junior College Accelerated Careers in Technology program (Levin et al., 2010).
- **Partner with industry to create internships**. For lessons learned and best practices for CCs partnering with industry, see Kisker & Carducci, 2003.
  - See examples of Cisco Networking Academy and General Motors Automotive Service Educational Program in Hagedorn & Purnamasari, 2012.
- **Consider recruiting industry experts to teach on CC campuses**. For example, many practicing and retired engineers could contribute to engineering education and strengthen the links between the engineering curriculum and the real-world applications of coursework (Mattis & Sislin, 2005).

See examples in *Retention* and *Outreach & Recruitment* sections of this document:

- Partner with industry to pose problems that students can solve collaboratively (Kisker & Carducci, 2003). [pg. 7]
- Use online tools to help students connect with industry mentors (Costello, 2012). [pg. 8]
- Create opportunities for students to have informal interactions with industry professionals – for example, "dinner with scientists" (Lenaburg et al., 2012). [Pg. 3]

Case Study: Involving Industry in Curricular Development

The Regional Center for Next Generation Manufacturing (RCNGM) developed a specialized, industry-driven curriculum that addresses "real-world" problems. Through a partnership with Connecticut industries, RCNGM identifies demand for skilled, technical workers in STEM fields and develops Technology Studies Curricula that prepare students for careers in these fields. Instructors are placed with advanced manufacturing companies for four-week externships in cutting-edge technologies – which prepare them to implement relevant curricula and classroom projects using real world, hands-on design projects.

(Costello, 2012)

Data Management

This section emphasizes two general practices: detail-level data collection to better identify points in students' paths where they might go off course, and sharing of this and other student success research with faculty and relevant staff so they can better use evidence-based practice as they serve students.

Collect disaggregated data at points spanning students' paths through and beyond CC

- **Track student progress at multiple points along their pathways, not just at entry and exit**. Collect data at intermediate points on pathways toward STEM program milestones. This kind of tracking reveals critical junctures where students might exit STEM programs and where supports might help them regain momentum.
    - See resources from Completion by Design to help trace student pathways through community college including the Loss/Momentum Framework (Rassen et al., 2013). Also see Completion By Design in the "Additional Resources" section.
    - Achieving the Dream participants developed both outcome and intermediate measures of student success that are not specific to STEM (Baldwin et al., 2011).
    - Example: The Benchmarking Equity and Student Success Tool (BESST) enables colleges to look at cohorts in a fine-grained manner along milestones and momentum points (Dowd et al., 2009).
- **Continue to track students once they complete their 2-year degree.** Monitor educational and career trajectories. Compiling and publicizing data on, for example, transfer students' success in obtaining B.S. or advanced STEM degrees can demonstrate the effectiveness of STEM studies in community colleges nationally and improve their recruitment rates or point to the need to strengthen community college programs (Delcham et al., 2009; Mattis & Sislin, 2005).
- **Collect mid-program student feedback.** When studying the success of certain programs, such as summer bridge programs, mid-program feedback may provide better data. Lenaburg et al. (2012) found that focus groups held during the middle of a bridge program produced the most helpful constructive feedback compared with data collected at the beginning or the end of the program.
- **Disaggregate student data to identify gaps by gender, ethnicity, or other demographic factors** (Hagedorn & Purnamasari, 2012).

Learn more about what works and share that information with faculty

- **Familiarize faculty with data regarding contributors to student performance.** They might otherwise rely on anecdotal or impressionistic information when making teaching or advising decisions (National Research Council, 2012).
- **Study mentoring strategies, and how they are linked to retention outcomes** (Carnegie Foundation for the Advancement of Teaching, 2008; Packard, 2012).

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American Association for the Advancement of Science (AAAS) (2011). *Vision and Change in Undergraduate Biology Education: A Call to Action*. Washington, DC. http://visionandchange.org/finalreport [2/25/14]

- Report from a 2009 national meeting focused on recommendations for improving undergraduate biology education for all students. Includes recommendations for creating "student-centered classrooms" and for integrating undergraduate research experiences into the classroom and the curriculum more generally.

American Society for Engineering Education (2009). *Creating a culture for scholarly and systematic innovation in engineering*. http://www.asee.org/about-us/the-organization/advisory-committees/CCSSIE/CCSSIEE_Phase1Report_June2009.pdf%20 [2/11/2014]

- Report focused on improving the quality of engineering education through innovation in curriculum, instruction, and assessment. Reviews literature and offers suggestions for practice.

Amelink, C.T., and Creamer, E.G. (2010). "Gender differences in elements of the undergraduate experience that influence satisfaction with the engineering major and the intent to pursue engineering as a career." *Journal of Engineering Education*, 99(1), 81-92.

- Study of nine institutions with undergraduate engineering programs finds that program culture, including acceptance by peers, the presence of female mentors and role models, and the perception that faculty care about student learning make a difference for both males and females in terms of persistence in engineering programs and intention to pursue engineering careers.

Anderson, G.M., Sun, J.C., and Alfonso, M. (2006). "Effectiveness of statewide articulation agreements on the probability of transfer: A preliminary policy analysis." *Review of Higher Education, 29*(3), 261-291.

- Based on a nationally-representative sample, the authors find that, controlling for individual demographic factors, students from states with state-wide articulation agreements are no more likely to transfer from 2-year to 4-year college than those students in states without those agreements (but the authors note that the study was conducted early in the implementation period). Suggests policies that might enhance transfer rates at the state level (pp.282-283).

Aspen Institute (2013). *Defining Excellence: Lessons from the 2013 Aspen Prize Finalists*. Aspen Institute, College Excellence Program, Washington, DC. http://www.aspeninstitute.org/sites/default/files/content/upload/DefiningExcellence_2.pdf [4/16/14]

- Report on lessons learned from finalists for the Aspen Institute's Prize for Community College Excellence. Focus is on completion, learning, labor market outcomes, and equity.

Bahr, P. (2008). "Cooling out in the community college: What is the effect of academic advising on students' chances of success?" *Res. Higher Educ.*, 49(8), 704–732.

- Analysis of students at 107 semester-based California community colleges finds that advising is beneficial to students' chances of success and underprepared students benefit more from advising than their college-ready counterparts.

Baker, E.D., Hope, L., Karandjeff, K. (2009). *Contextualized Teaching & Learning: A faculty Primer*. Center for Student Success/RP Group http://www.rpgroup.org/resources/CTL-primer [2/20/14]

- Defines contextualized teaching and learning (CTL), reviews the literature supporting it, presents models for implementation, and provides case studies of implementation in California community colleges.

Baldwin, C., Bensimon, E.M., Dowd, A.C., and Kleiman L. (2011). "Measuring Student Success." *New Directions for Community Colleges*, no.153, 75-88.

- Through three examples of current efforts (including Achieving the Dream and the Community College Student Success Project at UMass Boston), this chapter presents commonly used measures of student success, analyzes their strengths and weaknesses, and discusses innovative measures that are being used to benchmark community colleges.

Barnett, E.A., Bork, R.H., Mayer, A.K., Pretlow, J., Wathington, H.D., & Weiss, M.J. (2012). *Bridging the Gap: An Impact Study of Eight Developmental Summer Bridge Programs in Texas*. National Center for Postsecondary Research.

- Results of an experimental-design study examining short and long term effects of summer bridge courses on student outcomes.

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Bettinger, E., & Baker, R. (2011). "The effects of student coaching in college: An evaluation of a randomized experiment in student mentoring." NBER Working Paper No. 16881. Cambridge, MA: National Bureau of Economic Research.

- Used a randomized experiment with university undergraduate students to test the effects of individualized student coaching on academic outcomes among non-traditional college students. They found that students who were coached were more likely to persist during the treatment period and more likely to be attending the university one year after coaching ended. Coaching also proved more cost effective in achieving retention and completion gains compared with increased financial aid.

Boroch, D. and Hope, L. (2009). *Effective Practices for Promoting the Transition of High School Students to College.* RP Group and Center for Student Success, California Community Colleges. http://www.rpgroup.org/projects/high-school-transition [3/5/2014]

- Literature review that identifies practices consistently recommended for successfully transitioning high school students to college. Each practice is described, as are benefits to secondary and postsecondary students, results of research, research-based recommendations, and implications for practice.

Bragg, D.D., and Taylor J.L. (2014). "Toward College and Career Readiness: How Different Models Produce Similar Short-Term Outcomes." *American Behavioral Scientist.* Published online 1/7/2014.

- Exploration of pilot "College and Career Readiness" programs. Highlights different implementation models and uses qualitative data to explore the effects of different program elements.

Bragg, D.D. (2012). "Two-Year College Mathematics and Student Progression in STEM Programs of Study." In National Research Council and National Society for Engineering report: *Community Colleges in the Evolving STEM Education Landscape: Summary of a Summit.* http://www.nap.edu/catalog.php?record_id=13399 [3/25/2014]

- Specific recommendations for improving two-year college mathematics programs to better prepare students for STEM fields of study. Paper prepared for the Dec 15, 2011 *Summit.*

Brown, M.K., Hershock, C., Finelli, C., and O'Neal, C. (2009). *Teaching For Retention in Science, Engineering, and Math Disciplines: A Guide for Faculty.* Center for Research on Learning and Teaching, The University of Michigan. http://www.wskc.org/documents/281621/307235/EN-GAGE_KendallBrownHershockFinelli2009.pdf/3901b794-b7b0-4628-95a6-5959909945d7?version=1.0 [2/11/14]

- Focused on university students, this paper describes specific classroom strategies and teaching behaviors that have been demonstrated to improve student success in STEM. Also provides practical advice to individual faculty members who are seeking to implement these teaching strategies.

Carter, D.F. (2006). "Key issues in the persistence of underrepresented minority students." In E.P. John and M. Wilkerson (Eds.), *Reframing persistence research to improve academic success* (pp.33-46). San Francisco, CA: Jossey-Bass.

- Review of the literature on retention of undergraduate under-represented minority students at universities.

Chamany, K., Allen, D., and Tanner, K. (2008). "Making biology learning relevant to students: Integrating people, history, and context into college biology teaching." *CBE-Life Sciences Education*, 7(3), 267-278.

- Discusses the importance of making connections between biology and social issues, and then examines models of how to do so in the classroom and the curriculum.

Chaplot, P., Rassen, E., Davis Jenkins, P., Johnston, R. (2013). *Principles of Redesign: Promising Approaches to Transforming Student Outcomes.* Community College Research Center, Teachers College, Columbia University. http://ccrc.tc.columbia.edu/ [2/20/14]

- Offers a "distillation" of research and practice on community college student success into eight core principles. Focused on being useful to practitioners, the guide "reflect[s] a fresh approach to thinking about student outcomes: one that looks at the institution from the students' perspective and asks colleges to align structures, systems, programs and services in a coherent way."

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Costello, C. (2012). *Increasing opportunities for low-income women and student parents in science, technology, engineering, and math at community colleges.* Student Parent Success Initiative, Institute for Women's Policy Research, Washington, DC. http://www.iwpr.org/initiatives/student-parent-success-initiative/increasing-opportunities-for-low-income-women-and-student-parents-in-science-technology-engineering-and-math-at-community-colleges-1/view [2/28/14]

- Report that analyzes trends in women's representation in STEM at community colleges as well as promising institutional and policy practices for improving outcomes for women students in general and student parents in particular.

Coyle, E. J., Jamieson, L. H. and Oakes, W. C. (2006). "2005 Bernard M. Gordon Prize Lecture: Integrating Engineering Education and Community Service: Themes for the Future of Engineering Education." *Journal of Engineering Education*, 95, 7–11.

- Describes the Engineering Projects in Community Service (EPICS) program at Purdue, which won the 2005 Gordon Prize for Innovation in Engineering and Technology Education. EPICs is built around the concept of long-term partnerships between student teams and not-for-profit organizations in the community.

Dadgar, M., Venezia, A., Nodine, T., and Bracco, K.R. (2013a). *Providing structured pathways to guide students toward completion.* San Francisco: WestEd. http://www.wested.org/news-events/the-game-changers-series/ [2/26/2014]

- This is one of a series of "Game Changers" documents produced by WestEd for use by community colleges to generate discussion about innovative models for increasing completion rates. This report focuses on creating structures that help students commit to and complete programs of study.

Dadgar, M., Nodine, T., Bracco, K.R., and Venezia, A. (2013b). *Integrating Student Supports and Academics.* San Francisco: WestEd. http://www.wested.org/news-events/the-game-changers-series/ [2/26/2014]

- This is one of a series of "Game Changers" documents produced by WestEd for use by community colleges to generate discussion about innovative models for increasing completion rates. This report focuses on strategies for making student support services a more integral part of students' ongoing experience.

Deil-Amen, R. (2011). "Socio-Academic Integrative Moments: Rethinking Academic and Social Integration Among Two-Year College Students in Career-Related Programs." *The Journal of Higher Education* 82 (1), 54-91.

- Uses qualitative data to explore aspects community college socio-academic integration that positively contribute to student persistence.

Delcham, H., Hajallie, K., and Wang F. (2009). *Community College as a Pathway to Engineering Education and Careers.* Proceedings of the Conference Synergy in STEM: Bringing Mathematics, Physics and Engineering Together October 30, 2009 Brooklyn, New York. http://websupport1.citytech.cuny.edu/faculty/mseip/conference09/printables/Proceedings-1.pdf [2/18/14]

- Conference proceedings focused on strategies for STEM teaching and learning, including online courses, instructional innovations, interdisciplinary collaboration, interactive lecture demonstrations, etc.

Dimitriu, D., and O'Connor, J.O. (2004). "Forging Stronger Ties between Community Colleges and Four-Year Universities." Proceedings of the 2004 American Society for Engineering Education Annual Conference and Exposition (Session 2004-676). Washington, D.C.: *American Society for Engineering Education*, 6(1): 41–56.

- Brief lessons learned from the first year of two grant programs at San Antonio College. Focuses on four elements that emerged as vital for recruiting and retaining students in a community college engineering program and preparing them to be successful after transfer to a four year university.

Dowd, A.C. (2012). "Developing Supportive STEM Community College to Four- Year College and University Transfer Ecosystems." In National Research Council and National Society for Engineering, *Community Colleges in the Evolving STEM Education Landscape: Summary of a Summit.*

- Report focuses on recommendations for expanding access to STEM transfer pathways between community colleges and 4-year universities. Reviews national data and common challenges. Introduces "Evidence-

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Based Innovation Consortia" as a model for institutional change to support increased access to transfer pathways.

Dowd, A. and Coury, T. (2006). "The effect of loans on the persistence and attainment of community college students." *Research in Higher Education* 47: 33-62.

- Analyzes the National Center for Education Statistics' Beginning Postsecondary Students (BPS 90/94) data to predict persistence to the second year of college and associate's degree attainment over five years. During the period under study, loans did not contribute to higher persistence and attainment rates. Loans are observed to have a negative effect on persistence and no effect on degree attainment. The findings are attributed to a combination of the high uncertainty of degree completion among community college students and the negative affective component of indebtedness.

Dowd, A.C., Malcom, L.E., and Bensimon, E.M. (2009). *Benchmarking the success of Latino and Latina students in STEM to achieve national graduation goals*. Los Angeles, CA: University of Southern California. http://cue.usc.edu/news/NSF-Report.pdf [2/11/14]

- Report that identifies 25 Hispanic Serving Institutions (HSIs) in five states as potential exemplars of effective practices for increasing the number of Latina and Latino bachelor's degree holders in STEM. Encourages the use of three benchmarking strategies to monitor and increase the proportion of Latino STEM majors and graduates.

ENGAGE (n.d.). *ENGAGE Strategy research brief: Faculty-Student Interaction*. Engaging Students in Engineering. http://www.engageengineering.org/?page=137 [2/11/2014]

- Brief summary of the research demonstrating the importance of faculty-student interaction in STEM disciplines in increasing student persistence and completion.

Evans, H. D. and Mody-Pan, P. N. (2010). "Interpreting Successes of a Community College-University Partnership in Retaining Underrepresented Engineering Students." Presented at WEPAN/NAMEPA Joint Conference: Baltimore, MD. https://ojs.libraries.psu.edu/index.php/wepan/article/viewFile/58557/58245 [2/4/2014]

- Focuses on recruitment and retention of women and under-represented minorities in engineering. Presents an analysis of cross-sectional data (student survey responses) from the North West Engineering Talent Expansion Partnership, a statewide collaborative project among four community colleges and two universities in Washington State in 2004.

Fike, D.S., and Fike, R. (2008). "Predictors of First-Year Student Retention in the Community College." *Community College Review*, 36(2): 68-88.

- Analyzed predictors of fall-to-spring and fall-to-fall retention among 9,200 first-time-in-college students at an urban, Texas community college.

Focusing on student success. (2010). TCC Magazine, Winter: 2–3. http://www.tacomacc.edu/UserFiles/Servers/Server_6/File/abouttcc/_tccmagazine/Win2010_TCCMagazine_4web.pdf [3/6/2014]

- Tacoma Community College's newsletter to the community, highlighting the outcomes of its Achieving The Dream implementation.

Fullilove, R.E. and Treisman, P.U. (1990). "Mathematics Achievement Among African American Undergraduates at the University of California, Berkeley: An Evaluation of the Mathematics Workshop Program." *The Journal of Negro Education*, 59(3 – Summer): 463-478.

- Description and evaluation of Treisman's innovative Mathematics Workshop Program (MWP) at University of California Berkeley. The MWP significantly improved academic performance, improving passing rates and persistence.

Gregerman, S.R. (2008). "The role of undergraduate research in student retention, academic engagement, and the pursuit of graduate education." Paper presented at the National Research Council's Workshop Linking Evidence to Promising Practices in STEM Undergraduate Education, Washington, DC. http://sites.nationalacademies.org/DBASSE/BOSE/DBASSE_072631

- Describes the University of Michigan Undergraduate Research Opportunity Program as a model program for increasing the retention of historically underrepresented students in STEM fields. Describes program components as well as assessment and evaluation strategies.

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Goldfien, A.C. and Badway, N.N. (2014). "Engaging Faculty for Innovative STEM Bridge Programs." *Community College Journal of Research and Practice,* 38(2-3): 122-130.

- Researchers followed four community colleges for a year to understand local factors that facilitated or impeded implementation of a bridge program in which basic skills were contextualized in biotechnology. The findings are that implementation of a contextualized curriculum requires substantial faculty learning. Recommendations include planning for faculty development, both for faculty collaboration and contextualizing curriculum.

Hagedorn, L.S. and DuBray, D. (2010). "Math and Science Success and Nonsuccess: Journeys within the Community College." *Journal of Women and Minorities in Science and Engineering* 16(1): 31–50.

- Uses transcript analysis and descriptive methods to trace patterns of success and non-success in terms of the climb though developmental mathematics, focusing on time, course completion ratio, and grades, disaggregated by gender and ethnicity among students expressing a desire for a STEM career. Concludes that mathematics success is key to further success for STEM students.

Hagedorn, L.S. and Purnamasari, A.V. (2012). "A Realistic Look at STEM and the Role of Community Colleges." *Community College Review*, 40(2): 145-16.

- Offers an analysis of the predicted workforce shortages in STEM fields and what role community colleges might realistically play. Emphasizes CCs role in creating access for under-represented groups and also in boosting STEM teacher education.

Hagedorn, L.S., Cypers, S., and Lester, J. (2008). "Looking in the review mirror: Factors affecting transfer for urban community college students." *Community College Journal of Research and Practice*, 32(9): 643-664.

- Traces the history of students who successfully transferred to universities from community colleges and argues that the strongest predictor of transfer success is taking transfer-appropriate courses at the community college level.

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- Analyzes organizational data for three cohorts of African-American men to identify factors that best predict retention.

Handel, S. (2011). "Transfer and the role of two- and four-year institutional partnerships in addressing the nation's workforce and educational equity needs." *Journal of Applied Research in the Community College*, 18 (2): 6–12.

- Introduction to a special issue on the role of transfer pathways between two- and four-year institutions in addressing educational equity gaps.

Hassoun, S., and Bana, S. (2001). "Practices for recruiting and retaining graduate women students in computer science and engineering." Proceedings of the 2001 International Conference on Microelectronic Systems Education. http://csdl2.computer.org/comp/proceedings/mse/2001/1156/00/11560106.pdf [2/4/2014]

- This paper summarizes current practices by Computer Science and Engineering departments aimed at recruiting and retaining graduate women students.

Hodara, M. (2013) "Improving Students' College Math Readiness: A Review of the Evidence on Postsecondary Interventions and Reforms." Community College Research Center Working Papers Series. http://dx.doi.org/10.7916/D8M32SS7 [2/26/14]

- This paper reviews current research on the effectiveness of interventions and reforms that seek to improve the math preparedness and success of high school students entering college. Based on gaps in the research knowledge, it also provides recommendations for further inquiry

Hoffman E., Starobin, S.S., Laanan, F.S., and Rivera, M. (2010). Role of Community Colleges in STEM Education: Thoughts on Implications for Policy, Practice, and Future Research. *Journal of Women and Minorities in Science and Engineering.* 16(1): 85-96.

- Concluding essay to a special issue focused on the role of community colleges in STEM education. Discusses the measurement and analysis of current practices and suggests innovative research approaches and implications for institutional and state policy.

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- Report on the Concurrent Courses initiative, a program focused on making dual enrollment courses available to low-income, academically struggling, or historically underrepresented populations. Presents evidence on the benefits of dual enrollment and also offers lessons learned through the initiative for effective dual enrollment practice.

Hulleman, C. S. and Harackiewicz, J.M. (2009). "Making education relevant: Increasing interest and performance in high school science classes," *Science* 326: 1410-1412.

- In a randomized field experiment with high school students, authors found that a relevance intervention, which encouraged students to make connections between their lives and what they were learning in their science courses, increased interest in science and course grades for students with low success expectations.

Jackson, D. L., and Laanan, F. S. (2011). "The role of community colleges in educating women in science and engineering." In J. G. Gayles (Ed.), *New Directions for Institutional Research: No. 152. Attracting and retaining women in STEM* (pp. 39–49). San Francisco, CA: Jossey-Bass.

- This chapter offers policy and practice suggestions based on a mixed-methods study of the experiences of women in STEM who transferred to a four year college from the community college system (including suggestions for orientations, advising, and socio-academic integration). Discusses the role of community colleges in educating the next generation of women in STEM.

Jackson, D. L., Starobin, S. S., and Laanan, F. S. (2013). "The Shared Experiences: Facilitating Successful Transfer of Women and Underrepresented Minorities in STEM Fields." *New Directions for Higher Education*, 162: 69-76.

- This chapter addresses critical issues related to the transfer success of women and underrepresented minorities (URMs) in STEM disciplines and will highlight implications for fostering a successful transfer experience for these populations.

James Irvine Foundation. (2012). *Dual Enrollment for All: Reasons and Ways to Make It Work. Lessons for Educators and Administrators from the Concurrent Courses Initiative.* Practitioner Brief: http://ccrc.tc.columbia.edu/publications/broadening-benefits-dual-enrollment.html [2/6/2014]

- Brief overview of recommendations for dual-enrollment programs based on lessons learned from the concurrent courses initiative.

Jones, M.T., Barlow, A.E.L., and Villarejo, M. (2010). "Importance of undergraduate research for minority persistence and achievement in biology." *Journal of Higher Education, 81*(1): 82-115.

- Statistical analysis of transcript and admissions application data at UC Davis shows that undergraduate research participation is significantly associated with earning a baccalaureate degree and with persistence and outstanding performance among biology majors for all racial/ethnic groups at a large research university.

Karp, M.M. (2011). "Toward a new understanding of non-academic student support: four mechanisms encouraging positive student outcomes in the community college." Community College Research Center Working Paper No. 28. http://academiccommons.columbia.edu/catalog/ac:146656 [2/7/2014].

- This paper examines the ways in which academically vulnerable students benefit from non-academic support. By reviewing theories of student persistence as well as program evaluation literature, the author identifies four mechanisms by which nonacademic supports can improve student outcomes, including persistence and degree attainment. Programs associated with positive student outcomes seem to involve one or more of the following mechanisms: (1) creating social relationships, (2) clarifying aspirations and enhancing commitment, (3) developing college know-how, and (4) making college life feasible.

Karp, M. M., Hughes, K. L., and O'Gara, L. (2008a). "An exploration of Tinto's integration framework for community college students." *Journal of College*

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Student Retention: Research, Theory and Practice, *12*(1): 69 -86. http://files.eric.ed.gov/fulltext/ED501335.pdf

- Using in-depth interviews with students at two urban community colleges in the Northeast, the authors find that the majority of students do develop attachments to their institutions and this sense of attachment is related to their persistence in the second year of college. They also find that this integration is both academic and social – these two forms of integration develop in concert for community college students. Offers suggestions for ways to facilitate student integration via information networks.

Karp, M, Mechur J., Calcagno, J.C., Hughes, K.L., Jeong, D., Bailey, T.R. (2008b). *Dual Enrollment Students in Florida and New York City: Postsecondary Outcomes*. Report. Community College Research Center, Teachers College, Columbia University, New York. http://hdl.handle.net/10022/AC:P:19274 [3/15/14].

- Provides findings and recommendations from a study of dual enrollment programs with a specific focus on Career and Technical Education students. Findings support dual enrollment as a strategy for promoting student access to and persistence in postsecondary education.

Karp, M., Mechur, J., Stacey, G.W. (2013a). *What We Know About Nonacademic Student Supports: Research Overview*. Community College Research Center, Teachers College, Columbia University. http://dx.doi.org/10.7916/D88G8HPJ [2/19/14]

- One of three reports (Karp et al., 2013a-c) that are part of the Community College Research Center's Nonacademic student supports practitioner packet. They are brief, data-driven resources. This report presents a rational for their "Sustained, Strategic, Intrusive, and Personalized" advising model.

Karp, M., Mechur, J., Stacey, G.W. (2013b). *Designing a System for Strategic Advising*. Community College Research Center, Teachers College, Columbia University. http://dx.doi.org/10.7916/D8D798D8 [2/19/14]

- One of three reports (Karp et al., 2013a-c) that are part of the Community College Research Center's Nonacademic student supports practitioner packet. This report outlines their recommendations for a strategic advising model.

Karp, M., Mechur, J., Stacey, G.W. (2013c). *Student Success Courses for Sustained Impact: Research Report*. Community College Research Center, Teachers College, Columbia University. http://dx.doi.org/10.7916/D8J10150 [2/19/14]

- One of three reports (Karp et al., 2013a-c) that are part of the Community College Research Center's Nonacademic student supports practitioner packet. This practitioner-oriented guide has data-driven suggestions for how to design student success courses for maximum impact.

Kazis, R and Lincoln, C.A. (2013). *Advancing underrepresented minorities in STEM education and careers*. Report by Jobs for the Future and Achieving the Dream. http://www.achievingthedream.org/resource/advancing_underrepresented_minorities_in_stem_education_and_careers [2/6/2014]

- This paper characterizes the opportunities for underrepresented minorities in STEM fields and existing barriers to successful community college pathways. It concludes with recommendations for federal policymakers for improving preparation for the sub-Bachelor's degree STEM labor market.

Kienzl, G.S., Wesaw, A.J., and Kumar, A. (2011). *Understanding the transfer process*. Washington, DC: Institute for Higher Education Policy. http://media.collegeboard.com/digitalServices/pdf/advocacy/policycenter/understanding-transfer-process-community-college-ihep-121217.pdf

- Provides an overview of the current state of the transfer pathway for community college students seeking baccalaureate degrees. Identifies student, institutional, and state-level factors that accelerate or hinder transfer. Also compares community college students to their peers who start out in four-year institutions.

Kim, Y.K., and Sax, L.J. (2009). "Student–faculty interaction in research universities: Differences by student gender, race, social class, and first-generation status." *Research in Higher Education, 50*(5): 437-459.

- Findings suggest that while all students benefit from student-faculty interaction, different kinds of interaction (e.g., classroom-based vs. research-based)

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benefit students of different races, classes, and genders differently, leading to some implications for faculty practice.

Kisker, C.B. (2007). "Creating and sustaining community college-university transfer partnerships." *Community College Review, 34*(4): 282–300.

- Qualitative study of a community college-university partnership examines processes involved in creating and sustaining partnerships to enhance transfer and baccalaureate attainment. Particularly describes challenges in partnership management and governance, the importance of involving faculty in transfer-partnership programs and activities, and the utility of transfer partnerships in the future. Implications for practice are presented.

Kisker, C.B. and Carducci, R. (2003) "UCLA Community College Review: Community College Partnerships with the Private Sector-Organizational Contexts and Models for Successful Collaboration." *Community College Review,* 31(Winter): 55-74.

- Describes models of successful community college partnerships with local businesses and industry. Discusses benefits and challenges of these partnerships.

Kruse, T., Starobin, S. S., Laanan, F. S., and Russell, D. (2012). *The Influence of Financial Barriers on Transfer Decisions of Community College Students in STEM Courses.* Office of Community College Research & Policy, Research Brief No. 5. Series on STEM Student Success Literacy Project. Iowa State University. http://www.cclp.hs.iastate.edu/research/rbriefs/occrp-brief-kruse-july.pdf [3/25/14]

- Based on survey data of knowledge and transfer intentions among community college students enrolled in STEM courses. Finds that parents' socioeconomic status plays a large role in students' decisions to attend college and in their persistence from community college to 4-year college or university. Financial factors related to employment and number of dependents was not significantly related to transfer intentions.

Laanan, F. S. (2001). "Transfer student adjustment." In F. S. Laanan (Ed.), *New Directions for Community Colleges: No. 114. Transfer students: Trends and issues* (pp. 5–13). San Francisco, CA: Jossey-Bass. doi:10.1002/cc.16 http://files.eric.ed.gov/fulltext/ED456889.pdf

- Chapter discussing the trends surrounding transfer students and highlights issues affecting those students. Presents a synthesis of research on transfer students, post-transfer adjustment process, and perspectives on college adjustment.

Laanan, F.S. (2007). "Studying transfer students: Part II: Dimensions of transfer students' adjustment." *Community College Journal of Research and Practice,* 31(1): 37-59.

- Characterize the "complex transfer process" of community college students. This cross-sectional study examined a cohort of 717 students at a multicultural university in Southern California who transferred from 64 California community colleges during 1994 and 1995.

Laursen, S., Liston, C., Thiry, H., and Graf, J. (2007). "What good is a scientist in the classroom? Participant outcomes and program design features for a short-duration science outreach intervention in k-12 classrooms." *CBE–Life Sciences Education*, 6(1): 49-64.

- Findings from a qualitative research study of a "scientist in the classroom" intervention – a common outreach model where practicing professional scientists visit K-12 classrooms to offer short duration presentations, hands on activities, or discuss specific careers. Program design elements that lead to positive outcomes are discussed.

Lenaburg , L., Aguirre, O., Goodchild, F., Kuhn, J.U. (2012). "Expanding Pathways: A Summer Bridge Program for Community College STEM Students." *Community College Journal of Research and Practice*, 36(3): 153-168.

- The paper presents the results of an evaluation of a two-week residential summer bridge program that recruited community college students from a wide range of academic, ethnic, and socioeconomic backgrounds to degree programs in science, technology, engineering, and mathematics (STEM). Results identify the factors that increase the confidence and motivation of students to pursue STEM undergraduate degrees.

Levin, J. S., Cox, E., Kisker, C. Cerven, C., Haberler, Z., Smith, M., Chang, Y. Naylor, N., Malcom, L., Montero-Hernandez, V., Roys, J., Beach, J., Silverman, J., Mulholland, S. (2010). *Promising Practices in Community Colleges*. California Community College Collaborative

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(C4). http://c4.ucr.edu/ejournal.html [2/6/2014]

- Report on a field study of California community colleges, highlighting behaviors and characteristics of programs that constitute promising and effective practices. Identifies ways that these effective principles of practice could be transferred to other community colleges. Of interest: includes the example of the Accelerated Careers in Technology program at Modesto Junior College.

Malcom, L.E. (2008). *Accumulating (dis)advantage? Institutional and financial aid pathways of Latino STEM baccalaureates*. Unpublished dissertation, University of Southern California, Los Angeles.

- Traces the pathways of Latina/o bachelor's degree holders in STEM –related fields, particularly looking at the differences between those who earned associate degrees and those who did not, and examining the impacts of different college financing strategies. Although a pathway through community college was common for Latino bachelor degree holders, it was much less common for STEM BS degree holders. Latino STEM bachelor degree holders who earned an associate degree had lower levels of debt than non-associate degree holders.

Malcom, L. E. (2010). "Charting the pathways to STEM for latina/o students: The role of community colleges." *New Directions for Institutional Research*, 148 (Winter): 29–40.

- Describes ways in which community colleges have served as institutional pathways for Latina/o STEM bachelor's degree holders.

Markowitz, D.G. (2004). "Evaluation of the long-term impact of a university high school summer science program on students' interest and perceived abilities in science." *Journal of Science Education and Technology*, 13(3): 395-407.

- Evaluates an outreach program targeted to high school students and hosted by a research university (Summer Science Academy at University of Rochester). Based on self-report data from students, the program positively influenced their performance in advanced science courses as well as their decision to participate in other science programs and their desire to pursue a career in science.

Mattis, M. C. and Sislin, J. (2005). *Enhancing the community college pathway to engineering careers*. Washington, D.C., National Academies Press. http://site.ebrary.com/id/10103979.

- Report commissioned by the National Science Foundation, National Academy of Engineering and the National Research Council on mechanisms of successful transfer between community colleges and four-year institutions' engineering programs. Provides recommendations for enhancing the role of community colleges in educating engineers.

Mery, P. and Schiorring, E. (2011). "'It takes an integrated, college-wide effort' and other lessons from seven high transfer colleges." *Journal of Applied Research in the Community College, 18*(2): 33–34.

- Results from the Successful Transfer Approach Research (STAR) Project investigating seven California community colleges with consistently high transfer rates. Highlights 6 transfer-promoting factors as well as strategies and approaches for implementation.

MDC (2012). *What we know: Lessons from the Developmental Education Initiative*. http://www.mdcinc.org/resources/publications/what-we-know-lessons-developmental-education-initiative [2/6/2014]

- Report on a three-year effort to identify and scale programs that increase the number of community college students who complete developmental education and successfully move on to credit-bearing studies.

National Research Council and National Academy of Engineering. (2012). *Community Colleges in the Evolving STEM Education Landscape: Summary of a Summit*. S. Olson and J.B. Labov, Rapporteurs. The National Academies Press: Washington, DC. http://www.nap.edu/catalog.php?record_id=13399 [3/10/14]

- Report based on a national summit, highlighting the importance of community colleges in preparation of the STEM workforce. Includes recommendations from key scholars.

Nodine, T., Jaeger, L., Venezia, A., and Bracco, K. R., with research support from Public Agenda (2012). *Connection by Design: Students' Perceptions of Their Community College Experiences*. San Francisco, CA: WestEd. http://knowledgecenter.completionbydesign.org/sites/default/files/421%20Nodine%202012.pdf [4/22/14]

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- Report from focus groups of current and former community college students in four states who discuss their desires for and perceptions of their community college experiences. Includes a discussion of students' ideas of how to improve college completion rates.

Ohland, M.W., Sheppard, S., Lichtenstein, G., Eris, O., Chachra, D., and Layton, R.A. (2008). "Persistence, engagement, and migration in engineering programs." *Journal of Engineering Education, 97*(3): 259-278.

- This paper examines engagement factors and educational outcomes of undergraduate students in engineering majors compared to other fields of study. Aims to discover new insights regarding college outcomes for engineering students, the extent to which these outcomes and engagement factors are engineering specific, and how to improve desirable outcomes and remediate undesirable ones.

Packard, B.W. (2003a). "Student training promotes mentoring awareness and action." *The Career Development Quarterly*, 51(4): 335-345.

- Describes a "composite mentoring" program implemented for college women pursuing science careers. Discusses implications for advising, career counseling, and mentoring program design.

Packard, B.W. (2003b). "Web-based mentoring: Challenging traditional models to increase women's access." *Mentoring and Tutoring*, 11(1): 53-65.

- Review of the literature and evidence for web-based mentoring, especially for women pursuing non-traditional careers such as those in the sciences.

Packard, B.W. and Hudgings, J.H. (2002). "Expanding college women's perceptions of physicists' lives and work through interactions with a physics careers web site." *Journal of College Science Teaching, 32*(3): 164-170.

- Experimental study: students at an all-women's 4-year college show increased career knowledge of physics after interacting with a website that profiles women working professionally in physics.

Packard, B.W. and Nguyen, D. (2003). "Science career-related possible selves of adolescent girls: A longitudinal study." *Journal of Career Development*, 29(4): 251-263.

- Based on interviews with 41 female high school graduates from diverse ethnic and socioeconomic backgrounds, who had enrolled in an intensive math and science program while in high school. Mentoring relationships, developed through intensive summer programs or work-related internships, were critical to ongoing career development.

Packard, B.W. (2004-2005). "Mentoring and retention in college science: Reflections on the sophomore year." *Journal of College Student Retention: Research, Theory, and Practice*, 6: 289-300.

- Study of upper-level undergraduates enrolled in science majors at a research university. Finds that psychosocial and career mentoring may contribute to persistence in different ways. Students who received more career mentoring (sponsorship, challenge, coaching) were more likely to continue to major in science but differences in psychosocial mentoring did not predict either staying in a science major or switching to a non-science major.

Packard, B.W. (2011). *Improving Faculty Student Interaction: Research-based, time-effective tips to engage students*. Engaging Students in Engineering. http://www.engageengineering.org/?page=137 [2/11/2014]

- Brief report on the link between faculty engagement or mentoring and student satisfaction and degree completion.

Packard, B.W. (2012). "Effective Outreach, Recruitment, and Mentoring into STEM Pathways: Strengthening Partnerships with Community Colleges." In National Research Council and National Society for Engineering, *Community Colleges in the Evolving STEM Education Landscape: Summary of a Summit*.

- Commissioned paper for the Summit, focuses on summarizing research evidence and presenting the author's own suggestions about outreach, recruitment, and mentoring.

Packard, B. W., Gagnon, J. L., LaBelle, O., Jeffers, K., and Lynn, E. (2011). "Women's experiences in the STEM community college transfer pathway." *Journal of Women and Minorities in Science and Engineering*, 17(2): 129–147.

- Thirty women who transferred from community college to four-year institutions in STEM fields were

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interviewed once while finishing community college and again one semester later. Results illustrate both facilitators of successful transfer and barriers.

Packard, B.W., Babineau, M.E., and Machado, H.M. (2012a). "Becoming job-ready: Collaborative future plans of Latina adolescent girls and their mothers in a low-income urban community." *Journal of Adolescent Research*, 27(1): 110-131.

- Seventeen high school juniors and their mothers were interviewed about pursuit of a trade during high school and postsecondary plans in the nursing field. Findings include a perceived separation between nursing education and math and science education and an idea that a job such as nursing might facilitate the pursuit of college. Cases highlight the importance of family involvement, ethnic background, and socioeconomic status in the construction of college plans. Interventions are discussed.

Packard, B. W., Gagnon, J. L., and Senas, A. (2012b). "Navigating community college transfer in science, technical, engineering, and mathematics fields." *Community College Journal of Research and Practice*, 36(9): 670-683.

- Authors analyze the delay experiences of students navigating community college transfer pathways in STEM fields in Massachusetts. Three central institutional delays are highlighted: 1) informational setbacks from unsatisfactory advising, 2) imperfect program alignment with 4-year institutions, and 3) college resource limitations. Accumulation of delays was particularly detrimental to students pursuing STEM fields. Implications are discussed.

Packard, B. W., Tuladhar, C., and Lee, J. (2013). "Advising in the classroom: How community college STEM faculty support transfer-bound students." *Journal of College Science Teaching*. 42(4): 54-60.

- Study of the advising practices of STEM faculty from three Massachusetts community colleges who were identified by students as being supportive of their transfer efforts. Commonly named faculty members were significantly more likely to discuss transfer during class time than infrequently named faculty.

Palmer, R.T. and Wood, J.L. (2013). *Community Colleges and STEM: Examining Underrepresented Racial and Ethnic Minorities*. Hoboken: Taylor and Francis, 2013.

- Edited volume. Contributors discuss the role of community colleges in facilitating access and success for racial and ethnic minority students in STEM. Chapters explore how community colleges can and do facilitate the STEM pipeline, as well as the experiences of these students in community college, including how psychological factors, developmental coursework, experiential learning, and motivation affect success. Provides recommendations to help increase retention and persistence.

Perin, D. (2012). "Teaching academically underprepared students in community colleges." In *Understanding Community Colleges*, Editors: John S. Levin and Susan T. Kater. New York, NY. Routledge.

- Discusses the challenges faced by academically underprepared community college students and developmental education approaches designed to improve achievement. Contextualization is suggested as an alternative to traditional format developmental education. Concludes with recommendations regarding the structure of developmental education and interdisciplinary professional development.

Perin, D. (2011). "Facilitating Student Learning through Contextualization: A Review of Evidence." *Community College Review,* 39(3):268-295.

- This is a review of evidence for contextualization, defined here as an instructional approach connecting foundational skills and college-level content. Two forms of contextualization are identified, contextualized and integrated instruction. Despite methodological limitations, the available studies suggest that contextualization has the potential to accelerate the progress of academically underprepared college students.

Project Quantum Leap Sampler (2008). http://www.lagcc.cuny.edu/ctl/pql/sampler/ [2/25/14]

- A collection of contextualized math projects and assignments developed by LaGuardia Community College faculty that adapts the SENCER (Science Education for New Civic Engagements and Responsibilities) approach specifically for community college students taking developmental math.

Rassen, E., Chaplot, P., Jenkins, P.D., and Johnstone, R. (2013). *Understanding the Student Experience Through*

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The Loss/Momentum Framework: Clearing the Path to Completion. Community College Research Center, Teachers College, Columbia University. http://dx.doi.org/10.7916/D8N58JC7 [2/20/14]

- One of a series of 3 "inquiry guides" sponsored by the Completion by Design Initiative. This guide proposes a new framework, the "loss/momentum framework" as a means to better understand community college students' experiences and the specific areas that might be targets for reform and redesign. The concrete, practitioner-oriented guide offers information and tools to explore students' educational journeys with the goal of identifying areas for transformation and further inquiry.

Sablan, J.R. (2013). "The Challenge of Summer Bridge Programs." *American Behavioral Scientist*. First published online: December 23, 2013.

- This article presents a synthesis of research on Summer Bridge Programs (SBPs), including the range of methodologies used and outcomes studied. It provides a characterization of the breadth of SBPs, reviews the extant literature on SBPs, and discuss implications of these reviews for the future of SBPs.

Salm, S., Goodwyn, L., van Loon, N., Jayant, L., and DeLeon, P. (2008). "Learning benefits of a summer research program at a community college." *The American Biology Teacher*, *70*(4): e18-e22. http://www.nabt.org/websites/institution/File/pdfs/american_biology_teacher/2008/070-04-0018.pdf [3/5/14]

- Report on the outcomes of a five-week summer research program focused on basic molecular biology and tissue culture techniques at Borough of Manhattan Community College. Offers insights to practitioners who might design a similar summer workshop. The majority of students expressed interest in scientific careers and graduate school and reported increased confidence in themselves as academicians.

Scrivener, S. and Coghlan, E. (2012). *Opening doors to student success: A synthesis of findings from an evaluation at six community colleges*. MDRC Paper. http://www.mdrc.org/publication/opening-doors-student-success

- Rigorous evaluation of demonstration projects at six community colleges across the country focused on improving student academic outcomes. Strategies were based on focus groups with low-income students, discussions with college administrators, and an extensive literature review. There are four distinct programs based on the following approaches: financial incentives, reforms in instructional practices, and enhancements in student services.

Seymour, E., Hunter, A.-B., Laursen, S., and DeAntoni, T. (2004). "Establishing the benefits of research experiences for undergraduates: First findings from a three-year study." *Science Education*, *88*: 493-594.

- Descriptions of student-identified benefits of undergraduate research experiences drawn from an analysis of 76 student interviews gathered from four liberal arts colleges.

Shore, M., Shore, J., and Boggs, S. (2004). "Allied Health Applications Integrated into Developmental Mathematics using Problem Based Learning." *Mathematics and Computer Education,* 38.2: 183-189.

- Description and evaluation of a project to incorporate health examples into the developmental mathematics curriculum. Results show that students in sections that involved problem based learning and allied health examples performed significantly better than control group students.

Silva, E. and White, T. (2013). *Pathways to Improvement: Using psychological strategies to help college students master developmental math*. Carnegie Foundation for the Advancement of Teaching. http://www.achievingthedream.org/sites/default/files/resources/PathwaysToImprovement_0.pdf [2/6/2014]

- Describes Carnegie's Pathways to Improvement model (and successful results) for improving developmental mathematics instruction in community college settings. The model focuses on "psychological strategies for student success" – addressing student mindsets and motivation.

Starobin, S. S. (2004). *Gender Differences in College Choice, Aspirations, and Self-Concept Among Community College Students in Science, Mathematics, and Engineering*. Unpublished doctoral dissertation, University of North Texas.

- Investigates the influences of students' pre-college experiences on their college choice, aspirations, and self-concept among public community college stu-

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dents who aspire to study science, mathematics, and engineering. Also examines gender differences of these factors.

Starobin, S. S. and Laanan, F. S. (2008). "Broadening female participation in science, technology, engineering, and mathematics: Experiences at community colleges." In J. Lester (Ed.), *New Directions for Community Colleges*, No. *142: Gendered Perspectives on Community Colleges* (pp.37-46). San Francisco: Jossey-Bass.

- This chapter presents findings from interviews with female community college students in science, technology, engineering, and mathematics fields regarding their learning experiences, interaction with faculty, and educational and career aspirations.

Strayhorn, T. L. (2012). *College students' sense of belonging: A key to educational success*. New York, NY: Routledge.

- Reports from a series of studies on the impact of sense of belonging on various groups of college students.

Strawn, C. and Livelybrooks, D. (2012). "A Five-Year University/Community College Collaboration to Build STEM Pipeline Capacity." *Journal Of College Science Teaching*, *41*(6): 47-51.

- This article investigates the mechanisms through which undergraduate research experiences for community college students can have second-order and multiplier effects on other students and home community college science, technology, engineering, and mathematics (STEM) departments and thus build STEM pipeline capacity. Findings from focus groups with science faculty at five of the participating community colleges document positive changes. These include an improved sense of student–faculty community within departments and participants serving as aspirational role models for other students.

Summers, M.D. (2003). "ERIC Review: Attrition Research at Community Colleges." *Community College Review*, 30(4): 64-84.

- Reviews the literature regarding the scope and significance of community college student attrition and models to explain and predict it.

Tehan, L. (2007). "Advising the Single Parent College Student." *The Mentor*. http://dus.psu.edu/mentor/old/articles/070207lt.htm [2/4/14]

- Suggestions for advisors and mentors of single-parent college students.

Thompson, M. D. (2001). "Informal Student-Faculty Interaction: Its Relationship to Educational Gains in Science and Mathematics Among Community College Students." *Community College Review*, *29*(1): 35-57.

- Investigates the effect of informal student-faculty interaction on the differential patterns of science and math gains of male and female community college students. Higher levels of informal interaction with faculty was positively associated with the effort students exert in science courses and with science and mathematical educational gains. However, the gains for women were significantly lower despite similar patterns of informal interaction with faculty.

Townsend, B. K. and Wilson, K. B. (2006). "'A hand hold for a little bit': Factors facilitating the success of community college transfer students to a large research university." *Journal of College Student Development*, 47(4): 439–456.

- Interview-based study with 19 students who transferred from community college to a large state research university. Findings indicate that transfer students need more assistance navigating a large university and more information about faculty and student behavior at research institutions.

Treisman, U. (1992). "Studying students studying calculus: A look at the lives of minority mathematics students in college." *College Mathematics Journal*, 23(5): 362-372.

- Lecture outlining Treisman's experiences developing a model of challenging, collaborative, non-stigmatizing, support for students struggling in math but who do not see themselves as underprepared (the Mathematics Workshop Program). For a more formal evaluation see Fullilove and Treisman 1990.

Tsui, L. (2007). "Effective strategies to increase diversity in STEM fields: A review of the research literature." *The Journal of Negro Education*, 76(4): 555-581.

- Review of the literature on common undergraduate retention strategies in STEM fields (not CC specific), including mentoring, summer bridge, tutoring, undergraduate research, career counseling, learning

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centers, academic advising, college skills workshops and seminars, financial support, and curricular reform. Also reviews empirical support for three model intervention programs: Meyerhoff program, Minority Engineering Program (MEP), and the Mathematics Workshop.

Urias, M.V., Johnson, R.M., and Wood, J.L. (2013). "The effect of non-cognitive predictors on academic integration measures: a multinomial analysis of STEM students of color in the community college." In Palmer and Wood (eds.) *Community Colleges and STEM: Examining Underrepresented Racial and Ethnic Minorities*. Hoboken: Taylor and Francis.

- Evaluated the effects of self-efficacy and locus of control on academic integration. Greater self-efficacy – especially math self-efficacy – led to lower levels of academic integration (e.g., visiting faculty) whereas higher levels of internal locus of control led to higher levels of academic integration.

Vogt, C.M. (2008). "Faculty as a critical juncture in student retention and performance in engineering programs." *Journal of Engineering Education,* 97(1): 27-36.

- Study of the effects of academic environment on undergraduate students studying engineering at four research universities. Results showed that faculty distance lowered students' self-efficacy, academic confidence, and GPA. Academic integration had a positive effect on self-efficacy, which in turn had strong positive effects on effort and critical thinking.

Wachen, J., Jenkins, D., and Van Noy, M. (2010). *How I-BEST Works: Findings from a Field Study of Washington State's Integrated Basic Education and Skills Training Program*. Community College Research Center, Columbia University. http://ccrc.tc.columbia.edu/publications/how-i-best-works.html [2/28/14]

- Study of Washington State's I-BEST (Integrated Basic Education and Skills Training) program. I-BEST combines basic skills and technical instruction so that basic skills students can enter directly into college-level coursework. Basic skills instructors and professional-technical faculty jointly design and teach college-level occupational classes that admit basic skills-level students.

Walton, G.M., Cohen, G.L., Cwir, D., and Spencer, S. (2012). "Mere belonging: The power of social connections." *Journal of Personality and Social Psychology*, 102 (3): 513-532.

- A series of experiments demonstrating that even minimal cues of social connectedness raise motivation, including persistence on domain-relevant tasks.

Walton, G.M. and Cohen, G.L. (2011). "Brief Social-Belonging Intervention Improves Academic and Health Outcomes of Minority Students," *Science* 331 (6023): 1447-1451.

- Randomized control trial of a social belonging intervention among White and African-American first year college students. Over the observation period, African Americans' GPAs rose significantly compared to control groups. African-Americans' self-reported health and well-being improved.

Wang, X. (2013). "Modeling entrance into STEM fields of study among students beginning at community colleges and four-year institutions." *Research in Higher Education*, *54*(6): 664-692.

- Factors shaping the decision to pursue STEM fields of study is examined among students entering community colleges and four-year institutions. Results suggest specific points of intervention. The study also reveals differences in the impacts of these factors on community college vs. four-year students.

Winters, K.M., and Streveler, R. (2010). "How Student-Faculty Interactions Influence Student Motivations: A Longitudinal Study Using Self-Determination Theory." *Proceedings of the American Society for Engineering Education 2010*, Annual Conference Session AC 2010-1107.

- Four-year study using interviews with undergraduate students at a public research university to explore students' perceptions of interactions with faculty and how such interactions impact students' autonomy, competence and beliefs of group belonging. Findings suggest gaps between current classroom practices and student's needs.

Yeager D., Walton, G., and Cohen, G.L. (2013). "R&D: Addressing achievement gaps with psychological interventions." *Phi Delta Kappan,* 94(5): 62-65.

- Discusses research and practice in using psychological interventions to improve the performance of underachieving students. Based on a "student view-

Bibliography, continued

point" approach, argues that even when all students are treated similarly they can experience classrooms very differently. Reviews a few promising approaches with practical applications.

Zeidenberg, M., Jenkins, P.D., and Calcagno, J.C. (2007). *Do Student Success Courses Actually Help Community College Students Succeed?* Community College Research Center, Teachers College, Columbia University. http://academiccommons.columbia.edu/item/ac:157602 [2/7/2014]

- Reports findings from a preliminary in-depth analysis of the relationship between student success courses and student outcomes in Florida community colleges. Based on their analysis, enrollment in a student success course has a positive marginal effect on a student's chances of earning a credential, persisting, or transferring.

Zeidenberg, M., Cho, S. W., and Jenkins, P.D. (2010). *Washington State's Integrated Basic Education and Skills Training program (I-BEST): New evidence of effectiveness.* Community College Research Center, Columbia University. http://ccrc.tc.columbia.edu/publications/i-best-new-evidence.html [2/28/14]

- Analyzes the effects of the I-BEST program (for a description, see Wachen et al., 2010) on educational outcome variables including credit accumulation, persistence, basic skills point gains, and certificate or degree completion. Enrollment in I-BEST had positive impacts on all educational outcomes but persistence.

Additional Resources

Reports and evidence-based tools for increasing student success in community colleges:

Community College Research Center

- http://ccrc.tc.columbia.edu/
- Conducts research on the issues affecting community colleges and works with colleges and states to improve student success and institutional performance.
- Selected resources: http://ccrc.tc.columbia.edu/Resources/selected-audience-resources.html
- They also have brief, evidence-based papers and reports available on the Columbia University Academic Commons: http://academiccommons.columbia.edu/catalog/browse/departments/Community+College+Research+Center

Completion by Design

- http://www.completionbydesign.org
- Pathways analyses toolkit: This Toolkit describes the process and model analyses that CBD colleges use to analyze students' pathways, and design and evaluate their reforms. Filled with practical tools, templates, ideas and instructions. http://www.completionbydesign.org/our-approach/step-3-diagnose-the-issues/pathway-analyses-toolkit
- Knowledge center with resources related to student connection with, entry into, progress through, and completion of community college. http://knowledgecenter.completionbydesign.org/knowledge-center
- The Completion by Design (CBD) initiative is designed to help community colleges increase completion rates for large numbers of students while holding down college costs and maintaining the quality of programs and services.

WestEd's Game Changers Series

- The Game Changers series is designed to help community colleges significantly increase student completion rates. The series' three reports highlight reforms aimed at increasing the number of students graduating from community college. They are designed for use by colleges to generate discussion about innovative models for increasing completion rates substantially.
- http://www.wested.org/news-events/the-game-changers-series/

MDRC – Higher education

- Research on developmental education, student services, instruction and curricula, financial aid and institutional reform specifically for community colleges. http://www.mdrc.org/issue/higher-education

Models of STEM programs in community colleges

See Costello 2012 profiles of 7 Community College STEM programs:

- The Scholars Program in Math and Computer Science, Community College of Baltimore County, MD
- The South Carolina Advanced Technological Education Center, Florence-Darlington Technical College, SC
- Integrated Basic Education and Skills Training (I-BEST), Washington State
- California Mathematics, Engineering, and Science Achievement Program
- Regional Center for Next Generation Manufacturing, Connecticut Community Colleges College of Technology, Hartford, CT
- California WomenTech Extension Services Project, Alameda, CA
- STEM Equity Pipeline, Cochranville, PA >>

Additional Resources, continued

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CAITE (Commonwealth Alliance for Information Technology Education)

- Has a repository of best practices for educators http://caite.cs.umass.edu/educators/index.html
- Has a web site for students to explore IT careers http://www.takeitgoanywhere.org/

STEM ENGINES program

- A model for involving community college students in undergraduate research
- Main web page: http://www.stemenginesurc.com/
- Some papers about the program:
  - http://www.cur.org/assets/1/7/Fall08Brothers.pdf
  - http://www.cur.org/download.aspx?id=2723

Miami Dade College's Tools for Success Program

- An integrated program of academic and financial support for CC students interested in STEM, supported by an NSF grant – includes transfer scholarships.
- Tools for success.org

Instructor Resources

- **Applied Math and Science Education Repository (AMSER),** a portal of free educational resources and services built specifically for use by instructors at community and technical colleges.
  - ENGAGE – Engaging students in Engineering
  - http://www.engageengineering.org/
  - Has "Everyday Examples in Engineering" – lesson plans, demonstrations and ideas that can be used to illustrate various topics in Engineering.
  - Also has resources for improving faculty student interaction: http://www.engageengineering.org/?page=138 and a resource kit for assessing the quality of these interactions.
- **Teaching For Retention in Science, Engineering, and Math Disciplines:** A Guide For Faculty" Center for Research on Learning and Teaching, The University of Michigan, 2009.
  - http://www.wskc.org/documents/281621/307235/ENGAGE_KendallBrownHershockFinelli2009.pdf/3901b794-b7b0-4628-95a6-5959909945d7?version=1.0 [2/11/14]
- **Southern Regional Education Board** has developed two readiness courses to bridge the gap between high school and college level math and reading – their website offers details on the curricula, modules, and sample assignments.
- **Board on Science Education (BOSE)** Promising practices in undergraduate STEM education – white papers on the effectiveness of various pedagogical strategies http://sites.nationalacademies.org/dbasse/bose/dbasse_080106.

Additional Resources, continued

Administrator Resources

- **Community College outreach toolkit** from Broadening Advanced Technological Education Connections (batec.org)
  - Guides for transfer and outreach, working with industry.
- **MentorNet.org**
  - Online career-based mentoring system.
  - For a review, see Packard, B.W. (2003b). Web-based mentoring: Challenging traditional models to increase women's access. *Mentoring and Tutoring*, 11(1), 53-65.
- **Council on Undergraduate Research**
  - Resources for Community Colleges to help integrate undergrad research: http://www.cur.org/projects_and_services/special_projects/community_colleges/
  - They also run a listserve dedicated to the discussion undergraduate research at community colleges (http://www.cur.org/projects_and_services/special_projects/community_colleges/).
- ***Teaching by choice, cultivating exemplary community college STEM faculty.***
  - Patton, M. (2006). NSF sponsored resource for CCs on recruiting, training and retaining STEM faculty. Available at : http://www.aacc.nche.edu/Resources/aaccprograms/Documents/stemfaculty.pdf

Evaluating student outcomes

- ITest (soon to be STELAR): a database of instruments to assess student learning and other STEM-relevant outcomes http://itestlrc.edc.org/STEM_education_instruments

Collaboration and Community of Practice

- Student Success Centers – see this report from Jobs for the Future http://www.jff.org/publications/education/joining-forces-how-student-success-cente/1553

STEM Starter Academy
Awardee Gathering Feedback Survey – June 25, 2014
Morning Breakout Session: Campus Review of SSA Initiatives

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

- Program Manager/Coordinator – 10 Respondents
- STEM Starter Academy College Administrator – 7 Respondents
- Other – 4 Respondents
- ***Total Number of Respondents – 21***

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

The morning breakout session …	Strongly Agree	Agree	Disagree	Strongly Disagree	DK/NA
Gave me valuable new ideas and perspectives	29%	67%	0%	0%	5%
Provided a helpful opportunity to discuss and collaborate with others facing similar issues	71%	29%	0%	0%	0%
Offered concrete and useful examples of how other sites are refining their STEM Starter Academy programming	48%	43%	0%	0%	10%
Was helpful in getting me to reflect on 'lessons learned' and 'promising practices' that have emerged from work being done at my site	14%	71%	10%	0%	5%
Provided an effective venue for participants to share 'lessons learned' and 'promising practices' that have emerged from their sites	33%	52%	10%	0%	5%
Spurred my thinking about revising our approach to and/or identifying implementation priorities	52%	38%	0%	5%	0%
Will likely influence how I approach this work at my site	48%	48%	0%	0%	5%

3. What was most useful to you about the morning breakout, "Campus review of SSA initiatives" session?

- Getting a closer picture of all the programs at the other colleges
- Gained perspective on concerns/problems
- Meeting with other program managers to discuss their overall approach and philosophies
- Learning about other strategies being used for recruitment and outreach activities
- Discussion of common challenges (recruiting, timeline, etc.)
- Ideas from colleagues about things that can be implemented at my campus
- Interesting preliminary discussion. More unformed assessment can occur when we have some comparative data.
- The idea of scholarships
- Sharing ideas. See what other are doing, reinforcing the whole being done, opportunity to step back and reflect and discuss.
- Extended time to meet SSA colleagues and hear their experiences with the initiative.
- Opportunity to see what other schools are doing.
- Hearing what others are doing, networking
- Considering how to leverage existing campus resources in order to accomplish goals.
- Seeing what each college was doing and who they were targeting
- Seeing what and how other campuses are using the STEM grant
- Realizing we are the only campus actively working with adults

STEM Starter Academy
Awardee Gathering Feedback Survey – June 25, 2014
Morning Breakout Session: Campus Review of SSA Initiatives

- Discussion with QCC in breakout session
- Finding out about other campuses
- Sharing ideas and struggles
- Discussing what was happening at other campus and sharing experiences

4. What are some specific takeaways from the morning session and how might they affect your work?

- Recruitment issues are universal and need to be addressed
- Recruitment techniques
- The challenges around recruitment are shared. Ideas around outreach to KK will influence how we are perceived for future recruitment
- Think about our recruitment methodology and our target audience. Also, think about the retention methods we can use going forward
- Methods for recruiting adults to the program. Some Tech tools to assist in documenting students. Foundations of health program.
- Populations to target for recruitment. Ideas to carry program forward next year.
- Redesign of admissions process.
- Forming cohorts will now be a priority
- Some great ideas shared to consider. Thinking about how we can be more focused, effective, and sustainable.
- New ideas – scholarships, creating labs, we will consider some of these moving forward.
- Global issues we're all facing
- There are common themes i.e., recruitment. Our program is good, when you are in your bubble it is hard to gauge.
- Educating on-campus advisors on what STEM is and how to talk about it with students. Internship experiences – may lead to better upfront buy-in and future retention
- Interesting to hear how other colleges address developmental math
- I like the idea of "student groups" and may propose starting one on our campus
- Massasoit process for data collection, importance of contextualization, career connections, foundational science skills (critical thinking)
- PD with high school and middle school
- Recruitment approaches
- Ideas for year 2 (if that happens)
- Expanding student outreach

5. What suggestions do you have to improve this kind of breakout session in the future?

- Don't know
- N/A
- Nothing comes to mind. It was, overall, useful
- When there are multiple reps from a single Community College I would have them go to different groups.
- 1 hr. enough time
- N/A
- Build in time to update budget questions. If we ca/ process for amending our current budgets; New ISA- how to include this; timely updates on upcoming FY budget approval.

STEM Starter Academy
Awardee Gathering Feedback Survey – June 25, 2014
Morning Breakout Session: Campus Review of SSA Initiatives

- Guided worksheets or specific direction to keep groups on task; our discussion was completely dominated by one individual from one campus
- More time
- None
- None right now
- Format is good and wouldn't change it. One of the few formats when we get open time with peers
- More coffee

STEM Starter Academy
Awardee Gathering Feedback Survey – June 25, 2014
Afternoon Breakout Session: Campus Discussion of Cross-Cutting Topics

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 here participating in this gathering of STEM Starter Academy awardees?

- Program Manager/Coordinator – 6 Respondents
- College Administrator – 7 Respondents
- Other – 2 Respondents
- ***Total Number of Respondents – 15***

2. In which breakout session did you participate?

- Phase II Implementation – 3 Respondents
- Recruitment – 6 Respondents
- Retention – 6 Respondents

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

The cross-cutting topics breakout session …	Strongly Agree	Agree	Disagree	Strongly Disagree	DK/NA
Gave me valuable new ideas and perspectives on this topic	53%	40%	0%	7%	0%
Provided a helpful opportunity to discuss and collaborate with others facing similar issues	47%	53%	0%	0%	0%
Offered concrete and useful examples of how other sites are refining their STEM Starter Academy programming	20%	60%	7%	7%	7%
Was helpful in getting me to reflect on 'lessons learned' and 'promising practices' that have emerged from work being done at my site	33%	47%	7%	7%	7%
Provided an effective venue for participants to share 'lessons learned' and 'promising practices' that have emerged from their sites	33%	60%	0%	7%	0%
Spurred my thinking about revising our approach to this topic	53%	40%	0%	7%	0%
Will likely influence how I approach this topic at my site	53%	40%	0%	7%	0%

4. What was most useful to you about the afternoon breakout, "Cross-Cutting Topics" session?

- Refocus on the long term
- Discussion of sustainability to next year and beyond
- Understanding that other campuses had similar "timing" struggles
- Discussing recruitment strategies, both successful and less so, with a diverse group of campuses.
- Financial aid and implications of stipends
- There were aspects that made me reconsider how we are approaching our program
- Discussion, sharing, ideas
- Time to get more specific detail on key topics
- Ideas for fall
- Discussion of stipends (whether to give or not)

STEM Starter Academy
Awardee Gathering Feedback Survey – June 25, 2014
Afternoon Breakout Session: Campus Discussion of Cross-Cutting Topics

5. What are some specific takeaways from this session and how might they affect your work?

- Advisory team
- Insight on funding plan of state
- Start early!
- I want to think about ways we can better recruit non-traditional students
- Ideas to implement
- New strategies to consider
- Timeline and approaches for fall
- Chang our stipend policy?

6. What suggestions do you have to improve this kind of breakout session in the future?

- Bit confusing in how we were to break out

SSA Grantee Phone Meetings. SSA grantees participated in 10, hour-long conference calls over the course of 2014, facilitated by David Cedrone. The purpose of the calls was to share information across sites as well as to provide sites with guidance regarding SSA implementation and budgeting. The sites' primary contacts participated in the calls early in the year and were later joined by SSA coordinators who had been hired in spring and summer. UMDI evaluators also joined each call. Over the course of the year, topics ranged from planning and recruiting for summer bridge programs and generally promoting the SSA initiative to evaluation and reporting. Budgets and budget planning remained a consistent topic throughout.

Date	Topics Discussed	Notes
1-23-2014	▪ Campus-specific implementation summaries ▪ Building cross-campus collaboration/aggregating learning across campuses ▪ Possible funding extension to 12/31/14	DC requests summaries from each campus to include timeline, milestones, success metrics, and industry sector focus.
2-10-2014	▪ ISAs in progress ▪ Potential of funding extension to 12/31/14 ▪ Group site created ▪ UMDI evaluation team introduced ▪ DHE developing logo to brand SSA at state level.	DC wants this team of primary SSA contacts to promote collaboration across campuses.
2-28-2014	▪ Summer bridge plans across sites ▪ Logo: money set aside; vendor found ▪ Budget: no spending authority beyond June 30 ▪ Data collection: unique student identifiers should be collected to later link to HEIRS data	Summer bridge discussion includes target populations, duration, timing, curriculum, support services, recruitment strategies, size, and retention.
3-27-2014	▪ Budget approval to spend through 12/31/14 ▪ FY15 budget request submitted; same amt. as FY14 ▪ SSA funds for non-MA resident students? ▪ Evaluation update: phone interviews, promising practices document, supplemental data request, contact with IR personnel ▪ Logo: consensus on version; available on group site ▪ Data collection for recruitment activities: clarification ▪ SSA promotion at state level? ▪ In-person meeting ▪ Synergistic initiatives. DC will hold impromptu meetings at upcoming overlapping events.	In response to site feedback DC arranges for next call in Webinar format. DC encourages posting on group site – adding events to calendar and starting discussion topics. DC requests revised budgets with funding through 12/31
4-10-2014	▪ Budget: full $4.75 mil in house budget ▪ Plans for statewide announcement of SSA ▪ Campus updates: recruitment and planning for summer bridge; DC encourages recruitment of "non-traditional" STEM students ▪ Potential in-person meeting ▪ Collaboration – how to facilitate	DC requests that campuses post upcoming SSA events on group site calendar. General feedback re: webinar format is that it was helpful to know who was speaking and chat function was helpful.
6-25-2014	In-person convening – See "Technical Assistance Gathering" report section.	

7-31-2014	▪ FY14: additional $47K/campus to be spent by 12/31 ▪ FY15funding through 9/30/15; o DC: primary focus on recruiting (larger) 2nd cohort and retention of first cohort ▪ Evaluation plan for Year 2 ▪ DC proposes working groups based on topics that emerged at June meeting: o Recruitment o Retention and advising o Institutional alignment and sustainability o Summer programming o Evaluation	DC requests FY15 budgets and narratives by end of August Sites express some concern that key outcomes such as completion will not be available within funding period.
9-18-2014	▪ FY15 Budget: o Evaluation costs: campus vs. system o Set aside for cross campus collaboration? o Budget narratives – how FY15 budget reflects lessons learned from year 1 regarding recruitment, retention, summer bridge. o Sites note that 9/30/15 end date is difficult o Final budgets and narratives due 10/10/14 ▪ Working groups: DC encourages participation to bolster proposal for 3rd year funding. ▪ Evaluation – data collection: o Difficulty of tracking secondary participants who become primary participants. o Survey has been sent – due 10/3/14	Site feedback suggests that additional money would not necessarily help with working group engagement, except to pay for food or travel.
10-23-2014	▪ STEM summit reflections: positive ▪ Year 1 site report template distributed: discussion of overlap between year 1 and year 2 timelines. ▪ Evaluation: o 14 of 15 surveys complete o Feedback: campus concerns about survey ▪ Evaluation working group: DC wants leadership. ▪ Survey for former SSA participants – feedback ▪ FY15 budget: site differences	Some concern among sites about a disconnect between sites' work and "expectations in Boston"
11-20-2014	▪ 9C budget cuts – FY15 funding reduced to half ▪ Revisions to FY15 budgets and narratives ▪ Year 1 site reports – revised timelines ▪ 2015 SSA face-to-face meeting: sites agree this is a good idea; DC will initiate planning	
12-18-2014	▪ Year 1 site reports: DC has begun to review; ▪ 9C budget cuts: DC needs revised budgets o Reduced evaluation budget and work plan ▪ Grantee convening plans ▪ Upcoming deadlines for supplemental data	DC feels that Year 1 site reports contain the kind of information that will help with reporting to legislature.

Table 1: Secondary SSA Participants, 2014						
Institution (Community College)	Spring		Summer		Fall	
	Number of secondary SSA events/activities	Number of participants that took part in secondary SSA events/activities	Number of secondary SSA events/activities	Number of participants that took part in secondary SSA events/activities	Number of secondary SSA events/activities	Number of participants that took part in secondary SSA events/activities
Berkshire	26	84	5	144	15	343
Bristol	11	392	10	219	10	348
Bunker Hill	-	-	0	0	0	0
Cape Cod	7	299	6	405	7	151
Greenfield	4	115	9	235	3	305
Holyoke	24	770	5	15	1	18
Mass Bay	5	477	0	0	2	4
Massasoit	23	850	3	110	0	0
Middlesex	3	152	0	0	0	0
Mt. Wachusett	43	449	0	0	0	0
North Shore	3	250	4	1,220	7	400
Northern Essex	6	209	0	0	4	138
Quinsigamond	8	845	7	197	7	34
Roxbury	2	240	0	0	0	0
Springfield Technical	8	530	0	0	0	0
Total	**173**	**5,662**	**49**	**2,545**	**56**	**1,741**

Table 2: Primary SSA Participants - Spring 2014				
Institution (Community College)	Number of students who participated in any primary SSA activity/event from January through the end of spring term, 2014	Number of students who received direct (SSA grant subsidized) financial support	Number of students who received extra or targeted supports	Number of students who received targeted STEM pathway and/or STEM career counseling
Berkshire				
Bristol	13	13	13	13
Bunker Hill				
Cape Cod				
Greenfield				
Holyoke				
Mass Bay				
Massasoit				
Middlesex	101	26	20	45
Mt. Wachusett	236	0	0	0
North Shore				
Northern Essex	2	2	0	0
Quinsigamond	79	53	53	26
Roxbury	17	17	17	17
Springfield Technical				
Total	**448**	**111**	**103**	**101**

Table 3: Primary SSA Participants - Summer 2014					
Institution (Community College)	Number of students who participated in any primary SSA activity/event from the end of spring term the beginning of fall term	Number of students who received direct (SSA grant subsidized) financial support	Number of students who received extra or targeted supports	Number of students who received targeted STEM pathway and/or STEM career counseling	Number of students who were previously reported as a secondary STEM Starter Academy participants
Berkshire	21	21	21	21	16
Bristol	76	76	34	45	0
Bunker Hill	61	61	61	61	0
Cape Cod	5	5	5	5	5
Greenfield	18	18	12	18	8
Holyoke	72	72	71	71	47
Mass Bay	154	154	154	154	0
Massasoit	48	48	48	0	0
Middlesex	45	33	45	33	0
Mt. Wachusett	137	137	0	23	0
North Shore	55	55	55	31	55
Northern Essex	16	0	0	16	0
Quinsigamond	36	36	0	18	0
Roxbury	9	9	9	9	0
Springfield Technical	33	33	33	0	0
Total	**786**	**758**	**548**	**505**	**131**

Table 4: Primary SSA Participants - Fall 2014					
Institution (Community College)	Number of students who participated in any primary SSA activity/event from the end of summer term 2014 to the beginning of intersession (January) 2015	Number of students who received direct (SSA grant subsidized) financial support	Number of students who received extra or targeted supports	Number of students who received targeted STEM pathway and/or STEM career counseling	Number of students who were previously reported as a secondary STEM Starter Academy participants
Berkshire	21	21	21	18	16
Bristol	59	17	39	49	0
Bunker Hill	40	40	40	40	0
Cape Cod					
Greenfield	4	0	4	4	0
Holyoke	149	141	149	7	0
Mass Bay	374	5	306	70	0
Massasoit	643	643	643	0	0
Middlesex	172	16	144	148	0
Mt. Wachusett	337	0	0	235	0
North Shore	75	75	75	0	1
Northern Essex	233	5	233	228	0
Quinsigamond	265	265	0	58	0
Roxbury	7	7	7	7	0
Springfield Technical	44	31	41	3	0
Total	**2,423**	**1,266**	**1,702**	**867**	**17**

Table 5: Primary SSA Participants by Gender - Spring 2014				
Gender	Number of students who participated in any primary SSA activity/event from January through the end of spring term, 2014	Number of students who received direct (SSA grant subsidized) financial support	Number of students who received extra or targeted supports	Number of students who received targeted STEM pathway and/or STEM career counseling
Male	139	27	23	40
Female	179	52	49	59
No data	130	32	31	2
Total primary SSA participants	**448**	**111**	**103**	**101**

Table 6: Primary SSA Participants by Gender - Summer 2014					
Gender	Total students who participated in any primary SSA activity/event from the end of spring term to the beginning of fall term 2014	Number of students who received direct (SSA grant subsidized) financial support?	Number of students who received extra or targeted supports	Number of students who received targeted STEM pathway and/or STEM career counseling	Number of students who were previously reported as a secondary STEM Starter Academy participants
Male	311	298	235	204	61
Female	326	318	203	180	49
No data	149	142	110	121	21
Total primary SSA participants	**786**	**758**	**548**	**505**	**131**

Table 7: Primary SSA Participants by Gender - Fall 2014					
Gender	Total students who participated in any primary SSA activity/event from the end of summer term 2014 to the beginning of intersession (January) 2015	Number of students who received direct (SSA grant subsidized) financial support?	Number of students who received extra or targeted supports	Number of students who received targeted STEM pathway and/or STEM career counseling	Number of students who were previously reported as a secondary STEM Starter Academy participants
Male	941	563	719	287	15
Female	998	532	858	346	2
No data	484	171	125	234	0
Total primary SSA participants	**2,423**	**1,266**	**1,702**	**867**	**17**

Table 8: Primary SSA Participants by Race/Ethnicity - Spring 2014				
Race/Ethnicity	Total students who participated in any primary SSA activity/event from January through the end of spring term, 2014)	Number of students who received direct (SSA grant subsidized) financial support	Number of students who received extra or targeted supports	Number of students who received targeted STEM pathway and/or STEM career counseling
Non-resident Alien	3	1	0	1
Black or African American	26	11	10	15
American Indian or Alaska Native	1	0	0	1
Asian or Pacific Islander	1	1	1	0
Hispanic or Latino	66	21	15	16
White	176	31	32	47
Race and Ethnicity Unknown	143	35	35	7
Cape Verdean	3	3	3	3
Two or more races	7	1	1	2
Asian	22	7	6	9
Total	**448**	**111**	**103**	**101**

Table 9: Primary SSA Participants by Race/Ethnicity - Summer 2014					
Race/Ethnicity	Total students who participated in any primary SSA activity/event from the end of spring term to the beginning of fall term	Number of students who received direct (SSA grant subsidized) financial support	Number of students who received extra or targeted supports	Number of students who received targeted STEM pathway and/or STEM career counseling	Number of students who were previously reported as secondary SSA participants
Non-resident Alien	4	4	4	4	1
Black or African American	93	92	72	59	14
American Indian or Alaska Native	2	2	2	1	2
Hispanic or Latino	113	100	78	76	23
White	345	340	218	191	62
Race and Ethnicity Unknown	171	164	129	138	23
Cape Verdean	5	5	5	2	0
Two or more races	18	17	10	7	2
Asian	35	34	30	27	4
Total primary SSA participants	**786**	**758**	**548**	**505**	**131**

Table 10: Primary SSA Participants by Race/Ethnicity - Fall 2014					
Race/Ethnicity	Total students who participated in any primary SSA activity/event from the end of summer term 2014 to the beginning of intersession (January) 2015	Number of students who received direct (SSA grant subsidized) financial support	Number of students who received extra or targeted supports	Number of students who received targeted STEM pathway and/or STEM career counseling	Number of students who were previously reported as secondary SSA participants
Non-resident Alien	10	5	8	5	0
Black or African American	343	240	288	64	2
American Indian or Alaska Native	10	2	9	2	0
Asian or Pacific Islander	1	1	0	0	0
Hispanic or Latino	359	138	313	193	0
White	902	517	708	281	13
Race and Ethnicity Unknown	589	219	208	256	0
Cape Verdean	67	66	67	2	0
Two or more races	50	45	47	8	1
Asian	90	32	52	55	1
Native Hawaiian or Other Pacific Islander	2	1	2	1	0
Total primary SSA participants	**2,423**	**1,266**	**1,702**	**867**	**17**

Table 11: Primary SSA Participants by Race/Ethnicity and Site - Spring 2014											
Institution (Community College)	Non-resident Alien	Black or African American	American Indian or Alaska Native	Asian or Pacific Islander	Hispanic or Latino (of any Race)	White	Cape Verdean	Two or more races	Asian	Native Hawaiian or other Pacific Islander	Race and Ethnicity Unknown
Berkshire											
Bristol	0	0	0	0	0	11	1	1	0	0	**0**
Bunker Hill											
Cape Cod											
Greenfield											
Holyoke											
Mass Bay											
Massasoit											
Middlesex	2	9	0	0	16	53	0	2	16	0	**3**
Mt. Wachusett	1	6	0	0	34	85	0	4	4	0	**102**
North Shore											
Northern Essex	0	0	0	0	2	0	0	0	0	0	**0**
Quinsigamond	0	2	1	1	10	27	0	0	2	0	**36**
Roxbury	0	9	0	0	4	0	2	0	0	0	**2**
Springfield Technical											
Total	**3**	**26**	**1**	**1**	**66**	**176**	**3**	**7**	**22**	**0**	**143**

Table 12: Primary SSA Participants by Race/Ethnicity and Site - Summer 2014											
Institution (Community College)	Non-resident Alien	Black or African American	American Indian or Alaska Native	Asian or Pacific Islander	Hispanic or Latino (of any Race)	White	Cape Verdean	Two or more races	Asian	Native Hawaiian or other Pacific Islander	Race and Ethnicity Unknown
Berkshire	0	2	0	0	1	16	0	1	1	0	**0**
Bristol	0	3	0	0	6	56	2	5	4	0	**0**
Bunker Hill	1	21	0	0	15	18	0	0	3	0	**3**
Cape Cod	0	1	0	0	0	4	0	0	0	0	**0**
Greenfield	0	0	0	0	0	10	0	0	0	0	**8**
Holyoke	1	10	1	0	8	26	0	0	3	0	**23**
Mass Bay	0	13	0	0	14	42	0	0	7	0	**78**
Massasoit	0	7	0	0	5	26	3	0	1	0	**6**
Middlesex	2	5	0	0	7	13	0	2	11	0	**5**
Mt. Wachusett	0	11	0	0	17	87	0	7	3	0	**12**
North Shore	0	6	1	0	16	28	0	1	2	0	**1**
Northern Essex	0	0	0	0	12	0	0	0	0	0	**4**
Quinsigamond	0	7	0	0	4	3	0	0	0	0	**22**
Roxbury	0	0	0	0	0	0	0	0	0	0	**9**
Springfield Technical	0	7	0	0	8	16	0	2	0	0	**0**
Total	**4**	**93**	**2**	**0**	**113**	**345**	**5**	**18**	**35**	**0**	**171**

Table 13: Primary SSA Participants by Race/Ethnicity and Site - Fall 2014											
Institution (Community College)	Non-resident Alien	Black or African American	American Indian or Alaska Native	Asian or Pacific Islander	Hispanic or Latino (of any Race)	White	Cape Verdean	Two or more races	Asian	Native Hawaiian or other Pacific Islander	Race and Ethnicity Unknown
Berkshire	0	2	0	0	1	16	0	1	1	0	**0**
Bristol	0	2	0	0	2	40	3	3	3	0	**6**
Bunker Hill	0	15	0	0	10	6	0	3	3	0	**3**
Cape Cod											
Greenfield	0	0	0	0	0	4	0	0	0	0	**0**
Holyoke	2	15	1	0	40	78	0	5	1	0	**7**
Mass Bay	1	66	6	0	54	170	1	1	18	0	**57**
Massasoit	2	156	1	0	48	269	63	30	6	1	**67**
Middlesex	4	24	0	0	27	72	0	0	40	0	**5**
Mt. Wachusett	0	0	0	0	4	27	0	0	2	0	**304**
North Shore	0	0	0	0	0	2	0	0	0	0	**73**
Northern Essex	0	11	1	0	136	78	0	2	1	1	**3**
Quinsigamond	1	39	1	1	26	118	0	3	14	0	**62**
Roxbury	0	3	0	0	2	0	0	0	0	0	**2**
Springfield Technical	0	10	0	0	9	22	0	2	1	0	**0**
Total	**10**	**343**	**10**	**1**	**359**	**902**	**67**	**50**	**90**	**2**	**589**

Table 14: Primary SSA Participant Enrollment and Credit Hours - Spring 2014			
Institution (Community College)	Total number of continuing or enrolled students with credit hours accumulated prior to the current semester	Average (mean) total number of credit hours accumulated by enrolled students prior to the current semester	Standard deviation of total number of credit hours accumulated by enrolled students prior to the current semester
Berkshire			
Bristol			
Bunker Hill			
Cape Cod			
Greenfield			
Holyoke			
Mass Bay			
Massasoit			
Middlesex	1	5.0	0.0
Mt. Wachusett	10	2.3	1.6
North Shore			
Northern Essex	2	9.0	0.0
Quinsigamond			
Roxbury			
Springfield Technical			
Total	**13**	**3.5**	**2.9**

Table 15: Primary SSA Participant Enrollment and Credit Hours - Summer 2014			
Institution (Community College)	Total number of continuing or enrolled students with credit hours accumulated prior to the current semester	Average (mean) total number of credit hours accumulated by enrolled students prior to the current semester	Standard deviation of total number of credit hours accumulated by enrolled students prior to the current semester
Berkshire			
Bristol	32	7.3	2.9
Bunker Hill			
Cape Cod			
Greenfield	1	3.0	0.0
Holyoke	3	2.0	1.0
Mass Bay			
Massasoit			
Middlesex			
Mt. Wachusett	6	1.7	0.5
North Shore	6	3.3	4.3
Northern Essex			
Quinsigamond			
Roxbury			
Springfield Technical			
Total	**48**	**5.7**	**3.6**

Table 16: Primary SSA Participant Enrollment and Credit Hours - Fall 2014			
Institution (Community College)	Total number of continuing or enrolled students with credit hours accumulated prior to the current semester	Average (mean) total number of credit hours accumulated by enrolled students prior to the current semester	Standard deviation of total number of credit hours accumulated by enrolled students prior to the current semester
Berkshire			
Bristol	21	6.0	2.2
Bunker Hill	14	1.8	0.8
Cape Cod			
Greenfield	1	3.0	0.0
Holyoke	50	2.9	1.9
Mass Bay	100	2.7	1.6
Massasoit	117	2.1	1.3
Middlesex	119	4.3	2.6
Mt. Wachusett			
North Shore			
Northern Essex	65	3.3	2.6
Quinsigamond			
Roxbury			
Springfield Technical	12	4.0	2.5
Total	**499**	**3.2**	**2.3**

Table 17: Dually Enrolled Primary SSA Participants by Term, 2014			
Institution (Community College)	Number of Dually Enrolled Primary Participants Spring	Number of Dually Enrolled Primary Participants Summer	Number of Dually Enrolled Primary Participants Fall
Berkshire		0	0
Bristol	1	0	0
Bunker Hill		0	0
Cape Cod		0	
Greenfield		1	2
Holyoke		30	1
Mass Bay		2	1
Massasoit		11	8
Middlesex	2	0	3
Mt. Wachusett	58	30	23
North Shore		30	0
Northern Essex	0	0	1
Quinsigamond	0	0	0
Roxbury	0	0	0
Springfield Technical		0	0
Total	**61**	**104**	**39**

Table 18: Primary SSA Participant Program Status - Fall 2014			
Institution (Community College)	Number of First-time Freshmen (admissions)	Number of Degree Seeking Primary Participants	Number of non-degree seeking students
Berkshire	20	21	0
Bristol	25	50	1
Bunker Hill	13	39	1
Cape Cod*	-	-	-
Greenfield	2	2	2
Holyoke	62	147	1
Mass Bay	134	353	16
Massasoit	377	578	20
Middlesex	27	158	7
Mt. Wachusett	0	0	23
North Shore	0	0	0
Northern Essex	117	227	2
Quinsigamond	0	0	0
Roxbury	0	0	0
Springfield Technical	2	39	0
Total	**779**	**1,614**	**73**

*Note: Fall participation data were not available for Cape Cod at the time this report was prepared.

SSA Summer Program Goals

Site/ Program	Program Goals
Berkshire Community College	
Content Workshops	BCC had content workshops in math, reading and writing. The goal was to assist students in becoming college ready in those areas. Each workshop was 12 hours in length with math having additional out of school on-line work to complete. Students were required to attend workshops in content areas where they had not tested college ready accuplacer scores.
BCC STEM 101	To provide bridge to college experiences with success skill development and STEM Awareness
STEM Explore	To engage students in STEM pathway activities and to begin relationships with BCC STEM faculty.
Bristol Community College	
Summer bridge program	The program allowed incoming freshman students with an interest in a STEM field to take 3 college course and have access to STEM activities (field trips and guest speakers) and a STEM advisor. Students could take 1 math course, 1 science course, and a College Success Seminar course with a STEM focus. Students selected between a developmental chemistry course or a biology for majors course, and selected between a developmental math course or a college algerbra course.
STEM Learning Community	To provide a College Success Seminar STEM class and Developmental Math course to students interested in coming to BCC and have an interest in a STEM major/career. The goal was to help students get a jump start on their math so they would be able to take a follege level math course by the fall semester when they matriculated into their degree program.
Financial aid to near completers	To provide financial support for summer courses for students in STEM majors who are on track for graduating by December 2014 but may not have resources to pay for summer courses. The goal is to support these students working to graduateby December 2014.
Bunker Hill Community College	
Developmental math courses	Get STEM students through two semesters of developmental math in one summer.
Workshops (biology, engineering)	Expose students to either Biology or Engineering, and prepare them for the types of skills they would need for taking these classes in the future.
Cape Cod Community College	
Math course	Create awareness of STEM fields and jobs
STEM program meetings	Get an early start on college math requirements
Remedial education	Get students to improve math skills
Greenfield Community College	
STEM Starter Academy	The purpose of the STEM Starter Academy at Greenfield Community College (GCC) is multifold: 1. to facilitate the recruitment of rising seniors and recent high school graduates to GCC; 2. to enhance student success in STEM courses; 3. to promote retention of students in STEM fields and at GCC; 4. to facilitate transfer of STEM students to other institutions for continued study and training; 5. to promote STEM careers and facilitate job acquisition for STEM students
Math studio tutoring	To increase student success in Math classes.
Science studio tutoring	To introduce participants to STEM career options; to facillitate career exploration; to provide reseources for career exploration in STEM fields
Career exploration events	to help STEM Starter Academy participants succeed in science courses; to provide access to faculty tutors in science topics
Learning strategies workshops	to facilliate successful transition from High School to college; to teach active learning strategies; to overcome test anxiety
Holyoke Community College	
STEM Starter Academy	To introduce adult learners to educational and career opportunities in STEM fields (Sustainability, Health); to pilot STEM-contextualized math curriculum focusing on decimals, fractions, and percentages; to pilot science curriculum focused on scientific method and critical thinking, with career component embedded.
Adult transition-to-college program	Enroll students with a STEM major and/or interest in considering a STEM major in college credit summer course as part of a STEM cohort. The five week courses included supports such as dedicated tutors, peer mentors and a career counselor providing extended class activities to connect students to the college and further persist in STEM fields.

SSA Summer Program Goals

Site/ Program	Program Goals
MassBay Community College	
Summer bridge (high school)	To encourage discovery of STEM fields through caerfully designed hands-on STEM exploration activities
Summer STEM (middle school)	To create an interest in STEM careers during formative school years, early STEM Engagement
Computer coding workshop	Introducing Chemistry and Biology concepts to incoming students.
Life sciences workshop	To introduce Biotechnology concepts to prospective students
Biotechnology workshop	Informing students of STEM career pathways
Speaker series	To introduce computing concepts to prospective STEM students
TechBay internships	To provide hands-on STEM learning and paid student internship/career exploration activities with supervision from seasoned IT/helpdesk professionals
Career awareness workshops	To create awareness of STEM Careers
SSA classes	To provide credit bearing introductory STEM classes in a supportive environment
Massasoit Community College	
Career seminar speaker series	Demonstrate different STEM fields, skills and education for these STEM fields, and show what it takes to succeed in STEM academic and career pathways
Research experience	Participating in actual scientific research and project management
Coaching on college readiness	What it takes to succeed in STEM courses in college
Field trips	Improve understanding of STEM fields and careers, exposed to a 4 year college institution
Self-paced math course	Take a full semester developmental math or college algebra during the summer bridge program
Math boot camp	Improve test scores on the accuplacer
Middlesex Community College	
Two summer bridge programs	1. Familiarize students with the college, particularly the Health and STEM programs offered, 2. Strengthen and increase student's interest and appreciation of the different fields of science, 3) Engage and empower students while developing their success skills, such as critical thinking, communication, collaboration and organization, 4) Review available academic supports aimed at improving studying /learning skills, 5) Expose students to the benefits of campus involvement and of building strong connections on campus, 6) Inform students of careers in Health and STEM professions and how to start preparing for them. The successful completion of this program will give participating students hands on activities/experience in: 1) Environmental science; Biotechnology; Clinical lab techniques; Computer Science (Art-botics), 2) Researching and collaborating on a complex problem who's causes are multiple and uncertain, 3) Study Skills, Time Management and Supplemental Instruction, 4) The benefit of getting involved on campus and the impact it has on their college success, 5) Learning about opportunities in Research Experiences for Undergraduates, Externships and Internships, 6) career planning strategies and résumé development, and 7) Connecting with a Peer Achievement Mentor
Math boot camp	The goal of the Math Boot camp was to asccelerate students who tested below college level mathematics to accelerate their progress into college level math.IN addition, this saves students the cost of the developmental math class.
Mt. Wachusett Community College	
STEM Starter Academy	The goals of the SSA Summer Program were to get students successfully started in their STEM career, expose students to various STEM careers, and get students interested an excited about pursuing a STEM career.

SSA Summer Program Goals

Site/ Program	Program Goals
North Shore Community College	
Intro to Engineering (dual enrollment)	successful completion of a college-level course, exposure of students to multiple engineering fields, experience with problem-based learning
Math boot camp	To further students progress toward College-level math
STEM-focused orientations	Advising and orienting new STEM students, getting them properly placed in math, letting them know about bootcamp, peer mentors, and STEM starter academy coordinator for support.
Northern Essex Community College	
Summer bridge (lab sciences)	To provide an opportunity for students to explore Lab Sciences in a risk-free supported environment and to also assist students with the tools for academic success in science courses.
Quinsigamond Community College	
Introduction to biotechnology	Give students a better understanding of what Biotechnology is and allow students to earn college credits free of charge. Also provided some college readiness skills.
Build our own electric guitar	To teach how music and science are related.
Introduction to CSET	To get students interested in Computer Systems Engineering Technology and to allow them earn college credits free of charge. Also provided some college readiness skills.
Technology academy	To introduce students to various computer related careers and college programs. Some students participated in robotics.
Engineering challenge	Expose students to various engineering problems and work as teams to solve them.
Girls robotics	Prepare students for this year's robotics competition.
Transitioning to college	To introduce incoming Freshman to QCC's student services and programs. Also explore STEM careers.
STEM family academy	To introduce students recently arrived from Africa to STEM opportunities at QCC.
STCC	
Speaker series	The summer speaker series was intended to expand students' understanding of academic tracks at STCC, future career opportunities, and related issues associated with academic and career trajectories in STEM.
Field trips to museums and local industry	To provide the students with opportunities to receive additional tutoring assistance and a monitored setting to complete assignments and study.
hands-on activities	The goals of the field trips were to expose the students to different career paths and areas of study in STEM.
Two-week, intensive math review	The goal was to have the students learn about STEM in everyday activities.
College success course	The goal was to give the students a math refresher on coursework they may or may not have completed during high school study. Since our experience with Accuplacer is that it does not accurately assess whether students know various subtopics within a particular subject, we wanted our faculty to more accurately assess what the students knew and provide them with a chance to learn (or relearn) that material.
Algebra I	To prepare the students for the rigor of college.
Algebra II	To provide those students with a chance to complete a developmental math course before the start of their academic career at STCC during fall 2014. If successful, students would be able to take the next level of math (Algebra II) in fall 2014.
Tech Math I	To allow students to complete developmental coursework before fall 2014.
Essentials of engineering technologies	To allow students to enter into a more advanced, college-level math course upon entry into STCC in fall 2014
Tutor-run study halls	To expose students to introductory content in Engineering and Engineering Technologies coursework.

SSA Summer program type, acceptance, enrollment, completion, participation, duration and cost*																
Site/ Program	Interest Activities	College Readiness Activities	Coursework	Students applied	Students accepted	Students enrolled	Students completed	Recent HS graduates	Current HS students	Middle school students	Current community college students	Other prospective CC students	Other	Duration	Cost
Berkshire Community College															
Summer Bridge	x	x	x	22	22	21	21	x						3 weeks, full day	none
Content Workshops		x	x	18	18	17	17	x						1 week, full day	none
BCC STEM 101	x	x		22	22	21	21	x						1 week, full day	none
STEM Explore	x			18	18	18	n/a	x						1 week, full day	none
Bristol Community College															
Summer bridge program	x	x	x	15	15	15	14	x			x			11 weeks, half day	buy own textbook
STEM Learning Community		x	x	32	32	32	30	x			x	x		two days/week 4pm-6pm	none
Financial aid to near completers			x	31	31	31	31				x				none
Bunker Hill Community College															
Developmental math courses			x	61	61	61	58				x			8 weeks, half day	none
Workshops (biology, engineering)	x			49	49	41	39				x			3 days, full day	none
Cape Cod Community College															
Math course			x	7	5	5	5	x						summer semester	none
STEM program meetings	x			5	5	5	5	x						1 to 4 hours	none
Remedial education		x		3	2	2	2	x						summer semester	none
Greenfield Community College															
STEM Starter Academy	x	x	x	23	20	18	18	x	x		x		x	11 weeks, half day	buy own textbook
Math studio tutoring		x	x	0	0	11	11	x	x		x		x	11 weeks 2 hours/week	none
Science studio tutoring		x	x	0	0	1	1	x			x			11 weeks 2 hours/week	none
Career exploration events	x			0	0	18	18	x	x		x	x	x	1 hour/event	none
Learning strategies workshops				0	0	18	18	x	x		x		x	1 hour/ workshop	none
Holyoke Community College															
STEM Starter Academy	x	x	x	51	48	48	46	x	x		x			5 weeks, half day	none, $250 stipend offered
Adult transition-to-college program	x	x	x	66	27	25	21					x		6 weeks, 9 hours/week	none
MassBay Community College															
Summer bridge (high school)	x		x	40	40	40	35		x					2 weeks	$100
Summer STEM (middle school)	x			30	30	30	28			x				2 weeks, full day	$300
Computer coding workshop	x			150	150	150	150		x	x				1 hour/event	none
Life sciences workshop	x	x		7	7	7	5		x		x			1 week, full day	none
Biotechnology workshop	x	x		8	8	8	8		x		x			3 days, half day	none
Speaker series	x			20	20	20	20	x	x		x			1.5 hour/event	none
TechBay internships	x			7	7	7	7				x			varied	none, wage provided
Career awareness workshops	x			40	40	20	20		x					1.5 hour/event	none
SSA classes			x	131	131	131	n/a		x		x			6 week, 2 week or 10 week	normal tuition and fees

SSA Summer program type, acceptance, enrollment, completion, participation, duration and cost*

Site/ Program	Interest Activities	College Readiness Activities	Coursework	Students applied	Students accepted	Students enrolled	Students completed	Recent HS graduates	Current HS students	Middle school students	Current community college students	Other prospective CC students	Other	Duration	Cost
Massasoit Community College															
Summer Bridge	x	x	x	62	42	42	37	x			x		x	5 weeks, full day	none
Career seminar speaker series	x			62	42	42	37	x					x	4 lunches	none
Research experience	x	x		62	42	42	37	x						5 weeks, 2 hours/day	none
Coaching on college readiness		x		62	42	42	37				x			5 weeks, 1-2 hours/day	none
Field trips	x	x		62	42	37	37				x			4 trips	none
Self-paced math course		x	x	62	42	42	37	x			x			5 weeks, 3 hours/day	none
Math boot camp		x		20	15	15	15				x			2 weeks, 2 hours/day	none
Middlesex Community College															
Two summer bridge programs	x	x	x	50	50	34	28	x			x			2 weeks 9am-1pm	none, stipend offered
Math boot camp		x	x	21	21	13	6	x			x			4 weeks, half day	none
Mt. Wachusett Community College															
STEM Starter Academy	x		x	41	25	23	22	x			x			7 weeks, full day	none, $1750 stipend offered
North Shore Community College															
Intro to Engineering (dual enrollment)	x	x	x	57	31	31	28		x				x	4 weeks, 2 days/week	none
Math boot camp		x		68	30	27	24	x			x	x		4 weeks, 20 hours/week	$150 MyMathLab fee
STEM-focused orientations	x	x		n/a	n/a	n/a	35-45	x				x	x	2-3 hours/event	none
Northern Essex Community College															
Summer bridge (lab sciences)	x	x		11	11	11	11				x	x		8 weeks, full day	none
Quinsigamond Community College															
Introduction to biotechnology	x	x	x	16	11	8	7	x	x		x			3 weeks, full day	none
Build our own electric guitar	x			9	9	9	9	x	x		x		x	3 weeks, 11 hours/week	none
Introduction to CSET	x	x	x	15	15	8	8	x			x			5.5 weeks, 20 hours/week	none
Technology academy	x			98	98	98	98		x	x				3 weeks, full day	none
Engineering challenge	x			47	47	47	47		x	x				3 days	none
Girls robotics	x			17	17	17	17		x	x				1 week, full day	none
Transitioning to college		x		16	16	16	16	x						2 weeks, full day	none
STEM family academy	x			25	25	25	25		x	x				5 hours	none
STCC															
Summer Academy	x	x	x	120	65	33	30	x					x	7 weeks, full day	none, $1000 stipend offered
Speaker series	x			n/a	n/a	n/a	30	x					x	1-1.5 hours, 1 day/week	none, $1000 stipend offered
Field trips to museums and local industry	x			n/a	n/a	n/a	30	x					x	2-8 hours, 1 day/week	none
hands-on activities	x			n/a	n/a	33	30	x					x	1 hour/ event	none
Two-week, intensive math review		x		n/a	n/a	33	33						x	two weeks, 12 hours	none
College success course		x	x	n/a	n/a	33	31						x	7 weeks, 4-8 hours/wk	none
Algebra I			x	n/a	n/a	1	1						x	5 weeks, 10 hours/wk	none
Algebra II			x	n/a	n/a	10	9						x	5 weeks, 10 hours/wk	none
Tech Math I			x	0	0	22	21						x	5 weeks, 10 hours/wk	none
Essentials of engineering technologies			x	n/a	n/a	33	31						x	5 weeks, 8 hours/wk	none
Tutor-run study halls		x		n/a	n/a	33	30						x	daily, 3 hours	none

*** Note that sites defined "program" differently in their responses to the survey, which affects the interpretation of participation numbers. Berkshire, Massasoit, and STCC reported separate data for program elements that were each part of a more comprehensive summer bridge program. For ease of comparison, counts from these elements have been combined.**

Highlights of student experiences from summer survey

In the survey, sites were asked to share stories of student experiences with SSA activities. Several sites responded. Their stories are provided below.

- "We had one particular student in our Introduction to Biotechnology summer bridge class who had come from a fairly "rough" background. He really learned a lot and enjoyed the class – so much so that he was talking about working on a Biotech certificate or degree and making that his career path."[1]
- "One of our students, a Latino male, who had originally decided to no show on the first day of our summer bridge program. His working hours intersected with the daily schedule. 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. He brought enthusiasm for learning, and excelled. He is now a Math tutor for SSA."[2]
- "Two of our students spoke about their experiences with SSA (at a luncheon for newly identified high school STEM faculty). Both stated that the experience was tremendously beneficial to feeling a part of the Bristol Community College community and being prepared for college. One of the high school liaisons then concurred that the student she was listening to was not the same student that had graduated from her high school this past June. She was now happy, confident and committed."[3]
- "We have many non-traditional students here at Bunker Hill Community College, from older students to those who work full-time and go to school, to those with severe financial need, even homelessness. To hear those students express such gratitude to the professors and mentors who were there to help them makes me feel that this grant is really doing some good. One of our non-traditional students even wrote a poem for his professors on the last day of class."[4]
- "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 an ability to place into the course, she was able to enroll in college-level pre-calculus and successfully completed the course with a B+. Upon returning to high school this fall she had redoubled her efforts and her parents, teachers and guidance counselor have noticed. This summer program turned her around academically."[5]
- "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 has applied for the early entrant program for the spring. He has found a haven here at Greenfield Community College. The STEM Starter Academy helped him to prove to himself that he can go to college."[6]
- "One of our bridge students who had no idea what direction she wanted to go in discovered her passion in one of the workshops provided by the bridge. She was able to get the last spot in the program for the fall."[7]
- "Two STEM Starter students created and presented research posters, a high percentage of students competed at least two math classes over the summer, One STEM Starter student is currently conducting a research internship."[8]

[1] Quinsigamond
[2] STCC
[3] Bristol
[4] Bunker Hill
[5] Greenfield
[6] Greenfield
[7] Middlesex
[8] Massasoit

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	

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 Conference call with IR administrators (Re: Spring Supplemental Data Request)

4-17-14

Call led by: Jeremiah Johnson, Donahue Institute

1. Introductions

   Individuals at each campus who have been identified as the primary contacts responsible for facilitating data requests relevant to this evaluation were invited to join the call, and STEM Starter Academy program administrators at each campus were also welcome to join.

   Also on the call:

   - Mario Delci, Sasha Obraztsova and Sandy Riley from DHE's Office of Research and Planning
   - Jackie Stein, Donahue Institute

2. Purpose of call:

   a. To discuss the two data collection templates that were forwarded to each campus on April 1st ("Data Dictionary STEM Starter Academy Primary Participant Collection" and "STEM Starter Academy Secondary Participant Collection").

   b. To provide context and general information regarding the evaluation activities.

3. Brief overview of SSA evaluation

   a. General:

      i. Primary goals for this evaluation are to offer feedback about the impacts of the SSA initiative as a whole and to gather a set of best practices which can be used to inform the conversation about this initiative at each of your campuses. It is not our intention to conduct a comprehensive evaluation of every program at every site. Everything we can do early on to qualify this work and to provide a well-informed report to the legislature in the fall is going to go a long way toward sustaining funding support for this project.

      ii. We don't anticipate being able to measure the impact of this initiative on some important student outcomes such as retention, program completion, graduation and job placement for some time, but it is important for us to establish some of the data collection protocols and procedures now that will allow us to do that analysis in the future.

      iii. Site participation and cooperation are crucial to the evaluation. The quality of the outcomes the UMass Donahue Institute and DHE can capture and report will depend largely on the data we receive from each of you through data requests like the ones we are going to discuss today. Whenever possible, the evaluation team will use data you already submit to the state (like HEIRS), but we need a small amount of additional information about program participants.

   b. **Spring** evaluation activities are focused on program description, student recruitment, and participation. Future evaluation activities will focus more on student retention, program completion, graduation, and issues such as job placement.

   c. **Summer** evaluation activities:

      i. Online survey to gather feedback and thoughts on best practices from each of the campuses.

      ii. Observations at about a third of campuses for 1 or 2 days to get a clearer understanding of the nature and scope of the STEM Starter Academy programming, and to better understand how campuses are and connecting with students.

      iii. Second supplemental student data request near the end of the summer to capture summer activities. That supplemental data request will be similar to the spring data request, but not exactly the same.

d. **In fall,** primary focus will be analyzing data collected during the summer, identifying program impacts, and assisting DHE with reporting requirements for the State. Each site will be required to submit a report on their own activities and part of our responsibilities is to provide technical assistance during the preparation of those reports.

    i. We encourage each campus to think carefully to about the types of evidence they can collect themselves to have an indication of whether or not your campus is reaching the goals that you intend to reach.

4. Data requests

a. **Overview:** Spring data request is split for primary and secondary SSA participants. Campuses received these requests and instructions for submitting data on April 1st. Completed data files are due by Friday, May 30.

    i. **"Primary participants"** are community college students who participate in STEM Starter Academy (SSA) grant funded programs/events/activities.

    If a person is a registered community college student (i.e., has a student ID number) and participates in SSA funded/supported programs/activities/events this spring, then they should be reported as a primary participant.

    ii. **"Secondary participants"** are individuals who are not currently enrolled at a community college and participate in STEM Starter Academy grant funded programs, events, or activities.

b. **Primary participants** – Data dictionary

    i. Request includes 8 data fields for each participant, one row of information per student.

    ii. The first three data fields should be the same for every student at each campus:

        1. STM001, College ID, An institutional identification code, as assigned by the DHE
        2. STM002, Year (Calendar Year), The calendar year in which the activity was offered
        3. STM003, Term, The academic term in which the activity was offered

    iii. The 4th and 5th data fields will allow us to identify individual participating students, and to link the data you provide here to other data that you already submit for these individuals.

        1. STM004, Student's Social Security Number, The student's social security number
        2. STM005, Student ID, Identification code assigned to the student by the institution

    iv. Last three data fields in more detail:

        1. STEM Starter Academy Aid – whether or not student received direct STEM Starter Academy grant subsidized financial support such as a grant, stipend, tuition, fee waiver, or support with books – some actual financial support directly supported by SSA. The field is Yes or No.
        2. Extra Support – did the student receive extra or targeted support such as academic tutoring, peer mentoring, or other types of support. One way to capture, without evaluating specific programs at specific campuses, the many different types of programming going on across campuses.
        3. STEM Pathway or STEM Career Counseling – many campuses intend to offer STEM pathway or STEM career counseling to SSA students. Indicate whether or not student did actually receive that support.

    v. QUESTIONS:

1. Q: A student could start off as a secondary participant and then enroll in Starter Academy and get a student ID and become a primary participant?

   A: Yes. If you assign a student a college ID number, they should be listed as a primary participant for this data collection.

   Q: And if they just come to meetings and talk to us but don't enroll, that would be a secondary participant?

   A: Yes.

2. Q: What if we set up high school students with a student ID for a non-credit activity?

   A: If you give them a student ID, they should be recorded as primary participants. Reason is so we can link it to all the other databases we'll have available. Don't want to overburden sites by asking you to collect identifying data for all students who participate in recruitment activities. But if you do issue them a student ID, we would like to have that person recorded as a primary participant.

3. Q: What about students who participate in recruitment activities, but do not have a student ID until after the summer program, but then they do end up registering and attending classes in the fall?

   A: For this spring, those students would be included in your count of secondary participants (you would not need to list them individually). In the summer and fall, we anticipate that there will be many students who participated in some recruitment activity who were listed as secondary participants or included in that count who will then become primary participants. One of the fields we anticipate including in future data requests will be something like: "did this student participate in recruitment activities prior to joining the STEM Starter Academy?" We will collect that information second hand, but you do not need to do that right now.

c. **Secondary participants** – Secondary participant collection

   i. Excel file with three fields:

      1. Name of college
      2. Total number of SSA-supported events that occurred this spring. For example, if you had 4 recruiting events and visited 3 local high schools, that is 7 events total and 7 is what goes in that field.
      3. Count of the number of secondary participants who participated in SSA-grant-supported event or activity this spring. For example: recruiting events at local high schools, events at community centers, or campus recruiting visit. Many different ways you are reaching out. Want to capture a count of how many potential students participated in those activities. A total count across all of the activities that you conduct for SSA this spring goes in that field.

   ii. QUESTIONS:

      1. Q: Duplicated or unduplicated for number of participants? If a student attends more than one event, do we count them twice?

         A: It should be unduplicated. We are not requesting that sites keep precise records of students participating in these events – we know that such a data collection burden would be high. So we are not looking for lists of students who participate in these events, just a count. Because of the way we are collecting the data, it is possible that there will be duplicated students in that count, so if you have systems set up at your campus to avoid duplicate counts, please apply them in this request.

iii. This will require collaboration with the primary contact at each site.

d. **Submitting data**

i. Separate data submission procedures for the two data collection instruments (in order to separate files with student identifying information from those without student identifying information).

1. Primary Participant Data instrument should be submitted through HEIRS. Instructions were sent along with instrument. Questions can be sent to Jeremiah Johnson (774-455-7377, jjohnson@donahue.umassp.edu) or Sandy Riley at DHE (617-994-6957, sriley@bhe.mass.edu).

2. Secondary participant data should be forwarded to Sandy Riley via email, since there is no student identifying information associated with that request, so it can be emailed to her by May 30.

5. **Questions, comments, and feedback**

a. Q: trying to schedule data collection – can we anticipate that in addition to spring collection now, there will be an end of the summer collection, and then an end of the grant collection?

A: Yes, there will be separate data collections for each term: one this spring, one during the summer, and one during the fall. We are trying to set up the types of data requests which will make sense in the long term and it is our hope that this initiative and this evaluation will extend beyond the one-year grant funding cycle.

b. Q: You mentioned a survey?

A: This summer, we will send out a survey to primary contacts from each campus and it will be important that primary contacts consult with data administrators. We'll ask about many facets of summer programming. Survey will include qualitative, open ended, and closed ended questions.

Q: So, you will not be doing a student survey?

A: No, no student survey.

c. Q: Is there a conflict if students are considered primary participants but are dually-enrolled?

A: Not a conflict for the purpose of this data collection. If a student has a college ID number, they should be considered a primary participant.

d. Q: Because our program is not up and running yet, there will not be any primary participants for the spring – they will all be secondary. Should we submit a report with zero participants?

A: Fine to submit a data report with zero entries. If we do not receive a primary data collection from you or if you submit one that is blank, we will need to confirm with you that you had no primary participants.

e. For any questions we do not address on this call, or any issues with submitting data before May 30 deadline, there are many people available to answer – feel free to reach out to Jeremiah.