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Carlos E. Santiago
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MEMORANDUM

TO: Carlos E. Santiago, Commissioner

FROM: David Cedrone, Associate Commissioner for Workforce Development and STEM, Chief of Strategy and Operations

CC: Allison Little, Executive Director, STEM
Jeremiah Johnson, Research Manager, Applied Research and Program Evaluation, UMass Donahue Institute

DATE: June 17, 2017

SUBJECT: SSA Management Summary - Year 3 Evaluation

Introduction:

The STEM Starter Academy (SSA) program is an initiative of the Massachusetts Department of Higher Education (DHE) and the Commonwealth's system of 15 community colleges to inform, engage, recruit, retain and graduate significantly more students with STEM certificates and degrees. The University of Massachusetts Donahue Institute (UMDI), under contract to the Department of Higher Education, has conducted an independent evaluation of the SSA initiative over the past four years.

This Management Summary is provided by the program leadership team to offer context for interpreting the Key Findings of the SSA Year 3 evaluation report by informing readers of (1) the original design intent of the SSA program, (2) emerging and meaningful trends related to student enrollment status and participation in SSA, and (3) projected outcome expectations based both on current data analysis and trends in impacts over time.

Expand the STEM Student Pipeline:

The original design intent of SSA was to increase the pipeline of students who are aware of, interested in and prepared to pursue to completion rigorous certificate and degree programs leading to careers in STEM fields. The primary strategy was to target a more diverse population of students who are underrepresented in the STEM workforce and come from underserved communities across the commonwealth. A secondary and closely related strategy was to launch this program at scale across the 15 community colleges—providing access to STEM careers for

all students and developing a collaborative learning community that would define and share best-practices and affect segment-wide, system level change.

Minority student groups participate in SSA at levels that equal or surpass the proportion of these same groups in the overall community college population. SSA has reached and sustained significant scale of operation (7,172 primary participants in year three and over 50,000 primary and secondary participants since the inception of the program).

After three years of implementation and evaluation we have learned a great deal about the differentiated nature of the pipeline of students entering community college STEM programs and SSA. While our target population was and continues to be the underserved, underrepresented and underprepared students who may not initially see themselves as a "STEM Students", we now recognize that an increasing number of SSA students declare their intent to pursue STEM at enrollment and are often well prepared for the rigors of STEM coursework upon entry to the college. We have also recognized that some students enroll in Liberal Arts programs at community college with a focus on biology, chemistry and other "classical" STEM subjects. These Liberal Arts/STEM students make up a critical element of the STEM pipeline, pursuing and earning certificates and degrees in fields that require exposure to and fluency with contemporary STEM topics as well as developing critical thinking, problem solving, and collaboration skills that are often associated with STEM education. These students may or may not receive services from SSA and, to date, have not been counted in the overall STEM student population for the purposes of SSA evaluation. This differentiation of the student pipeline may affect current outcome measures of SSA, such as graduation rates, and must be accounted for in our future evaluation protocol and program performance metrics.

The SSA program management team must refine outcome expectations and the design of services provided to sub-categories of students across the spectrum of the incoming pipeline. For the original target group of students (underrepresented, underserved, underprepared), participation in summer bridge programming and successful progression to and completion of college level mathematics courses is a critical measure of achievement, whereas certificate and degree completion is an unrealistic outcome expectation for this population, at this time.

Enrollment, Retention & Completion:

Recruiting a more diverse population of students to STEM subjects is only a first step in expanding the STEM Student Pipeline. We need students to successfully persist to completion and move into the workforce or to higher levels of education.

An important predictor of completion is full-time enrollment. This Year 3 evaluation has observed that a higher proportion of SSA students are enrolled full-time than the general community college student population (12% higher). This, we anticipate, may result in increased graduation rates of STEM students in future years. SSA may also be having an impact on total enrollment at the community colleges as enrollment in STEM remained steady from Fall 2014 (23,263) to Fall 2016 (23,521) despite a decline in overall enrollment from 96,887 students to 87,527 students over the same time period.

As community college students require, on average, 3 years to complete their programs of study (with many taking longer, affected in part by mathematics readiness and the increasing

percentage of part-time student enrollment), it seems unreasonable to expect increases in student completion as a result of SSA participation after only two years (the measurement timeframe of this evaluation). Also, given the original and continuing target student focus (underserved, underrepresented, and underprepared), these students will likely take longer to complete rigorous programs that lead to a STEM certificate or degree, although that certainly remains the goal.

Students participate in SSA at different levels of intensity, possibly linked to their enrollment status (Liberal Arts-STEM, STEM declared at enrollment, part time vs. full time). The level of services received by students (dosage) will likely affect their outcomes. This has become an increased focus of data gathering and analysis in the current evaluation project and will continue in the future.

An unanticipated finding from the analysis of data through the evaluation is that students who declare an interest in pursuing STEM upon enrollment in the community college, whether they are SSA students or not, are 30 times more likely to complete a STEM degree or certificate within two years than similar students who do not declare an interest in STEM upon enrollment. This finding may be critically important to the Early College (STEM) initiative.

The program management team has confidence that these and other trend indicators in the evaluation report offer reasonable predictions of positive STEM student outcomes in the near future. The findings presented in the Year 3 evaluation report are overall positive although not statistically significant and indicated as such by the independent evaluators (UMDI).

Best Practices at Scale:

The STEM Starter Academy initiative is focused on affecting system-level change through at-scale implementation and determining and sharing best-practice implementations across institutions.

Program implementations across sites show evidence of incorporating and integrating SSA model elements and lessons from inter- and intra-campus work. Campus visions for SSA have coalesced around the model even as individual practices continue to vary (by design of the program) across the community colleges.

- The programs, personnel, and practices supported by SSA have become deeply integrated into the STEM infrastructure of the community colleges. SSA continues to evolve as sites come to better understand how to best serve their students.
- The project has supported and facilitated an ongoing learning community with full participation by each of the 15 community college campuses.
- Sites report that increased capacity—achieved through SSA investments— has facilitated expanded partnerships with employers and 4-year higher education institutions.
- Campuses report that SSA has improved the visibility and reputation of community colleges as STEM destinations in their communities and statewide.

Evaluation efforts have focused on assessing the impacts of SSA on participation and outcome metrics that are relevant across all 15 campuses rather than assessing the impact of SSA on individual campuses. Therefore,

system-level reporting is the primary function of this report. Some site-level data are provided but are not the primary focus of this evaluation.

Strategic Considerations/Next Steps:

- Reflect the various sub-categories of students in the STEM pipeline in data collection and analysis of future evaluation reports.
- Refine the SSA program model to represent emergent consensus regarding successful core practices and work with sites to move SSA activities into greater alignment with those practices.
- Expand the definition of "STEM" for SSA to include liberal arts programs with STEM.
- Expand the collection of student-level SSA dosage data.
- Support additional collection and sharing of campus-level data and evaluation.

Attachment: SSA Year 3 Annual Evaluation Report, Appendices