Massachusetts Department of Higher Education

STEM Starter Academy
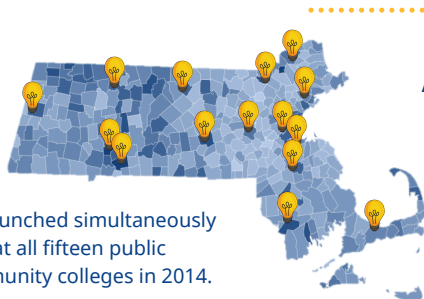## *Impact and Value*

July 2020

SSA: Key Features & Approaches

The **STEM Starter Academy** (SSA) is a Massachusetts Department of Higher Education (DHE) initiative to **recruit, ready, retain, and complete** significantly more students through **community college STEM pathway programs** that result in job placement within STEM professions or transfer to university STEM programs
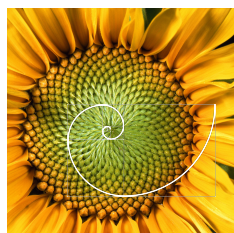
Focused on STEM, Advancing Equity

- Meets a growing need for a diverse population of STEM-skilled graduates
- Recognizes the untapped potential of under-served and underrepresented populations
- Supports differentiated approaches to increase equity in access and outcomes

SSA launched simultaneously at all fifteen public community colleges in 2014.

At-Scale Implementation, Local Contextualization

- Facilitates transformation across the community college system
- Enhances and extends existing STEM pathways at each institution
- Allows local adaptation to address regional markets, build institutional capacity, and develop wrap-around supports

Best Practices

- Identifies, innovates, and curates effective practices to advance community college students through STEM programs
- Cultivates collaborative learning community—across and within institutions—in order to adapt and replicate best practices
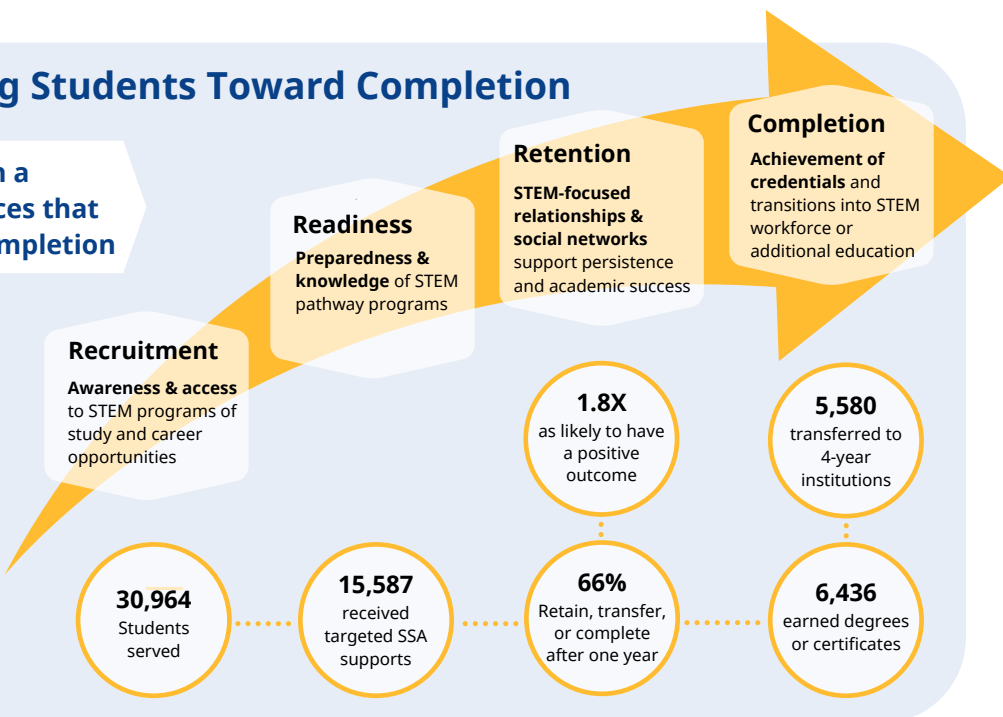
Advancing Students Toward Completion

SSA promotes student success through a curated program of learning experiences that are sequenced from recruitment to completion

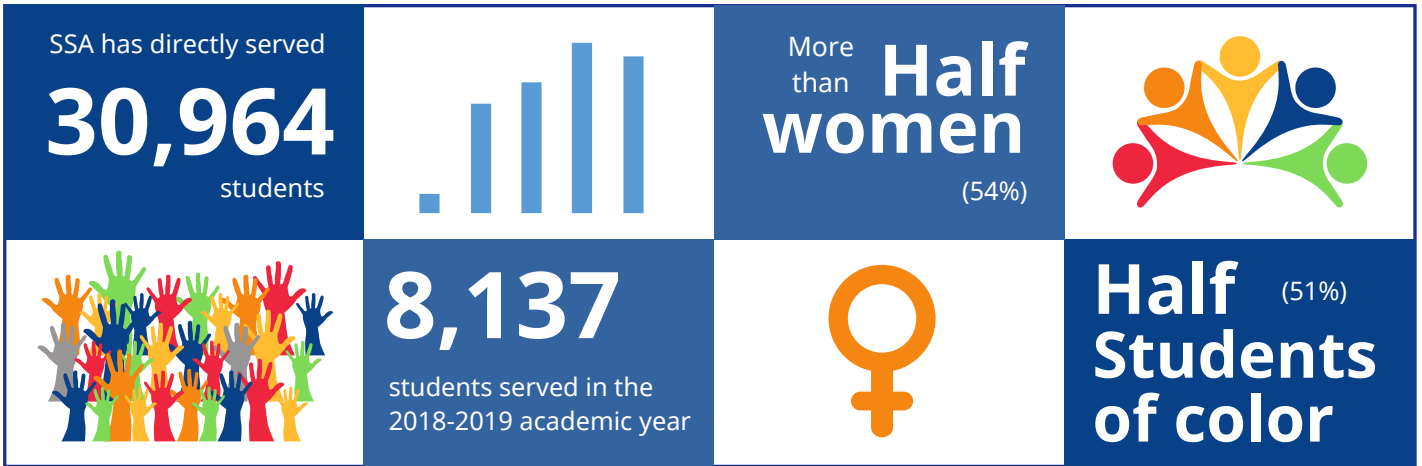SSA serves a diverse range of student needs, ensuring that participants are accessing:

- ▶ rigorous academic curriculum;
- ▶ campus, peer, and industry relationships; and
- ▶ wrap-around supports.

Through these practices, SSA advances students toward the goal of a career in the STEM workforce.

Recruitment
Awareness & access to STEM programs of study and career opportunities

Readiness
Preparedness & knowledge of STEM pathway programs

Retention
STEM-focused relationships & social networks support persistence and academic success

Completion
Achievement of credentials and transitions into STEM workforce or additional education

30,964
Students served

15,587
received targeted SSA supports

66%
Retain, transfer, or complete after one year

1.8X
as likely to have a positive outcome

6,436
earned degrees or certificates

5,580
transferred to 4-year institutions

Who is served by SSA?

From 2014 to 2019...

SSA has directly served **30,964** students

More than **Half women** (54%)

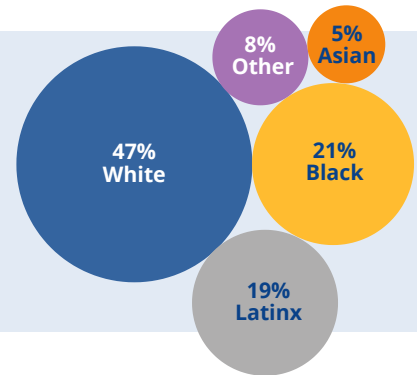**8,137** students served in the 2018-2019 academic year

Half Students of color (51%)

Reflecting Institutional Diversity

SSA participants reflect the racial/ethnic diversity of the overall population of community college students.
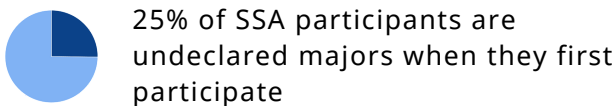
SSA promotes increased recruitment and retention of students from diverse backgrounds and who have been traditionally underrepresented in STEM professions.
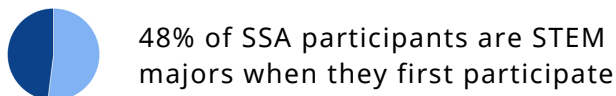
8% Other
5% Asian
47% White
21% Black
19% Latinx

STEM and Potential STEM Students

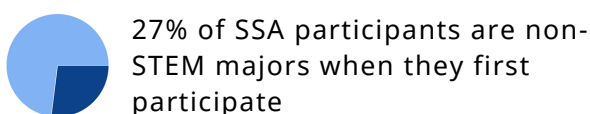SSA serves students with a range of STEM interests and preparation through a variety of strategies.

Building awareness and success among students who had not considered STEM fields

25% of SSA participants are undeclared majors when they first participate

Supporting students who are already interested in STEM but need extra preparation

48% of SSA participants are STEM majors when they first participate

Benefiting students who are in non-STEM fields through events and academic supports

27% of SSA participants are non-STEM majors when they first participate

"I go to my class and I'm either the only female or we are two. So, it was kind of like 'No, it's a male thing.' And then [SSA] started this Women in STEM [program]. There, we fortified each other. You know you're probably the only one in your class, but then you have a huge network outside."
—*Quinsigamond CC Student*

SSA Participants: Fast Facts

25+ **33%** of participants were 25 years old or older when they first joined SSA

46% of participants were part-time students when they first joined SSA

67% of those assessed were not ready for college-level math when they entered their institutions

30% of participants were actively engaged with SSA for 2 or more terms

Student Outcomes

SSA Students Fare Better Than Their Peers

Overall

1.8x — SSA participants were **more likely to have a positive outcome** after two years

Latinx students

1.7x — Latinx participants were **more likely to have a positive outcome** after two years
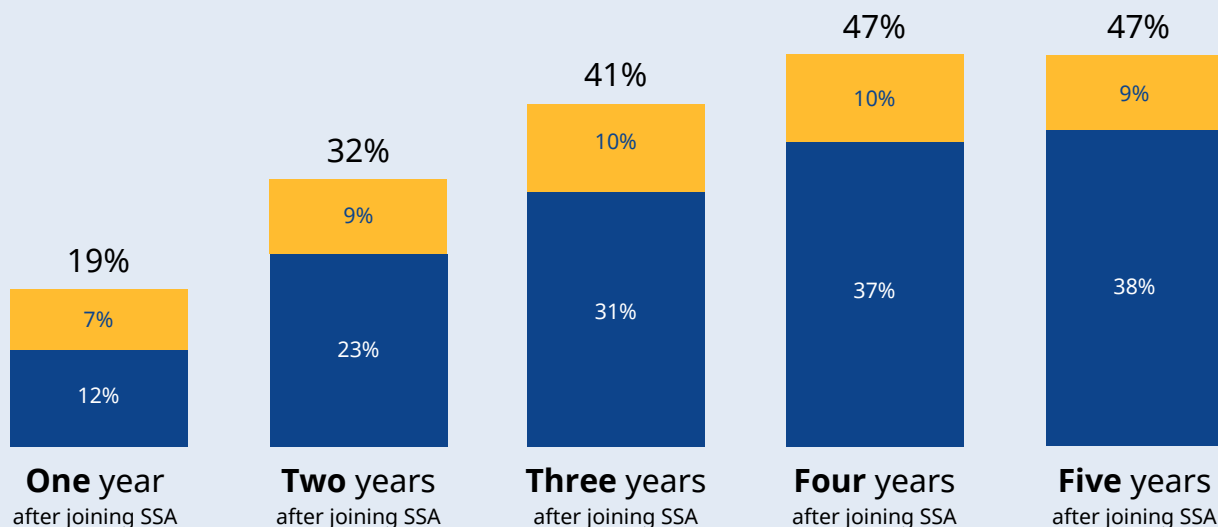
African American students

2.2x — African American or Black SSA participants were **even more likely to have a positive outcome** after two years

*Positive outcomes include graduation, retention, transfer, or STEM employment. SSA participants, Latinx and African American/Black SSA participants from 2014–2019 were compared to similar non-participants.

SSA Students Advance Toward Earning a Degree
Progress Builds Years After Initial Participation

■ Completed Degree or Certificate   ■ Transferred to 4-year*

	One year after joining SSA	Two years after joining SSA	Three years after joining SSA	Four years after joining SSA	Five years after joining SSA
Total	19%	32%	41%	47%	47%
Transferred to 4-year*	7%	9%	10%	10%	9%
Completed Degree or Certificate	12%	23%	31%	37%	38%

Note: Five-year outcomes are only available for one cohort, those who started SSA in 2014 (N=2,955). Similarly, four-year outcomes include cohorts starting in 2014 or 2015 (N=6,789), three-year outcomes include cohorts starting in 2014, 2015, or 2016 (N=11,769), two-year outcomes include cohorts starting in 2014, 2015, 2016, or 2017 (N=16,990), and one-year outcomes include cohorts starting in 2014, 2015, 2016, 2017, or 2018 (N=21,897).
*Students who transferred without completing a degree or certificate at the community college.

Impacts on Students

From 2014 to 2019...

6,436
SSA participants earned degrees or certificates

3,760
Completed developmental math after participating in an SSA sponsored intervention that term

3,724
SSA participants earned credentials in STEM fields

5,580
SSA participants transferred to 4-year institutions

> "Before I met [the STEM advisor] I wasn't thinking science or math. ... I didn't have a direction. Now I have something that I can say I want to do 20 years down the road."
> —*Cape Cod CC Student*

Students participating in SSA report positive experiences

Improved knowledge/performance and stronger connections

83% — *Better knowledge of academic supports and resources (n=3,117)*

75% — *Improved performance / achievement in courses (n=2,836)*

75% — *Stronger connections to other students (n=2,825)*

72% — *Stronger connections with faculty (n=2,737)*

Percentage of surveyed students who agreed or strongly agreed that these resulted from their participation in SSA .

Greater confidence and self-efficacy in STEM

80% — *I can better understand the concepts in a STEM course (n=2,973)*

77% — *I feel more confident about asking questions in my STEM courses (n=2,889)*

76% — *I feel more confident that I can think like a mathematician, scientist, engineer, and/or other STEM professional (n=2,858)*

76% — *I feel more confident that I will be able to use STEM-related knowledge and skills in my future career when needed (n=2,857)*

Percentage of surveyed students who agreed or strongly agreed with each statement.

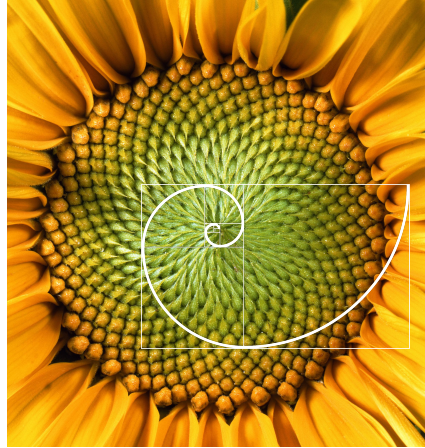# Impacts on Institutions

Facilitating Change

**Across the community college system,
SSA initiates and sustains changes that benefit institutions***

Capacity

SSA-affiliated staff and faculty collaborate with offices of admissions, advising, academic support, and career/transfer counseling to integrate supports for STEM students.

STEM Pathways

SSA facilitates access to STEM pathways by supporting changes to advising or academic programs.

Community

SSA cultivates a collaborative STEM learning community across institutions. SSA staff and programming have also become central hubs of STEM relationships and activity within many colleges.

Innovation

SSA programs serve as models that spur innovation and replication beyond STEM departments.

Connections

SSA encourages collaboration across STEM departments—building networks and making STEM more visible to students, staff, and faculty.
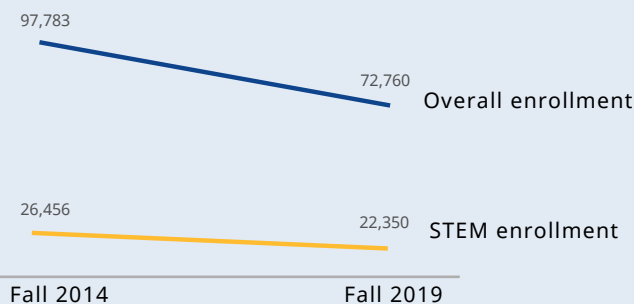
Perceptions

SSA participants serve as visible examples of the success that community college students can have in STEM—fueling interest from peers, high school students, and the broader community.

*Data from interviews with SSA and institutional administrators

Supporting the STEM Pipeline

While overall enrollment in community colleges has decreased since 2014, the proportion of students that enroll in STEM programs has increased.

97,783
72,760
Overall enrollment

31%
27%

26,456
22,350
STEM enrollment

Fall 2014   Fall 2019

Fall 2014   Fall 2019

Experiences & Connections

Building Relationships
that connect students to support and opportunity

Through SSA, many community colleges have built stronger connections with their peer institutions, high schools, 4-year colleges, and STEM employers—creating linkages that enhance students' awareness of STEM, readiness for rigorous study, and planning for careers in the STEM workforce.

Many SSA programs offer STEM-focused early college activities and courses where high school students are taught by college faculty.

SSA participants also serve as ambassadors for their colleges, returning to their high schools to recruit participants and serve as role models for other students.

SSA staff have built relationships on and off campus, fostering awareness and interest in community college STEM programs among high school, 4-year college, community organization, and industry stakeholders.

Relationships with industry and community partners—initiated or supported by SSA funding—provide mentorship, internship, and career opportunities while also supporting curriculum development and STEM career readiness and awareness.

Advancing Students Toward Careers in the STEM Workforce
Through industry and community partnerships

Career Exploration

Personal relationships

300+
Industry partnerships developed through SSA

"We're all working on this. Faculty, administrators, and professional staff are all looking at long-term sustainability, for example, by going to meetings, conferences, and building long-term relationships."
—*Roxbury Internship Coordinator*

Professional mentorship

STEM-related work experiences

"Going through the mentor program made me realize this is something I *can* do and *want* to do. And [it] helped me narrow down what field… environmental engineering with a minor in chemistry."
—*MassBay CC Student*

130+
SSA participants placed in internships with industry partners (2018–2019)