Summary
To address the representation gap in the sciences, a partnership of institutions implemented two different early-college/dual-enrollment courses for high-school students, each of which ran for 5 years: a concurrent (in-school) enrollment program, and a summer residential program.

The study was designed to determine if participation in dual-enrollment science courses in high school increases the likelihood that minority students would consider majoring in science or decreases the rate at which students leave STEM majors. Through longitudinal student records, many students were tracked into their college careers where we identified their choice of academic major or program. More than 80% of them remained in STEM programs for over one year and/or are still in STEM today.

The two dual-enrollment programs

1. Concurrent-enrollment: In-school courses taught by college faculty
Science faculty from Prince George’s Community College (PGCC) came to area high schools and taught science courses for credit during the school year. A total of 307 students participated.

Courses taught: Environmental Biology, Forensic Biology, and Physics.

2. Summer residential program on a university campus
On the campus of Bowie State University (BSU), area high-school students enrolled for three consecutive summers during their high-school careers. Students took supplemental courses and were tutored in mathematics and college skills along with credit-bearing science courses. A total of 74 students completed the program.

Courses taught: Biology and Chemistry, as well as preparatory (non-credit) courses in science, math, and college skills.

Nearly 400 high-school students participated in the programs, nearly all of them African-American, from 10 different high schools in the district. The comparison group was the total student population at the participating colleges, which mirrored the treatment group’s demographics. Per-student cost was three times higher for the residential program.

Outcomes: Student persistence in STEM
Altogether, more than 3,000 college-credit hours in science were awarded to 381 students while they were still in high school. The vast majority of students do quite well in the courses offered by both programs; the average grade was a B, and more than 90% passed each course. In interviews and focus groups, several students expressed positive views about the dual-enrollment experience.

We tracked nearly half of them after they graduated. Nearly all of them entered college immediately, and more than half declared majors in STEM fields.

(Outcomes continued on reverse side.)
Outcomes (continued)

In contrast to the typically low persistence rate of students in STEM majors (about half overall and one third of African Americans), **80% of our dual-enrollment students remained in STEM for over one year and/or are still in STEM today.** These outcomes were the same regardless of which of our two dual-enrollment programs the students had completed.

Several students in the concurrent-enrollment program remained enrolled at PGCC after graduating from high school. Of these students, **51% entered a STEM-related degree program at some point,** 75% of whom remained in STEM for at least a year. This is a much higher proportion than the 14% of PGCC students who are enrolled in STEM programs at any given time at the college.

Interventions sustained

The successful model for dual enrollment created by the (MSP)$^2$ project has provided an important foundation for the rapid expansion of dual-enrollment efforts in the district. New and expanded programs, policies, and collaborative partnerships make use of the specific practices, materials, and relationships developed by the (MSP)$^2$ dual-enrollment programs.

Most significantly, the partnership between PGCPS and PGCC has been dramatically strengthened. The two institutions have jointly formed a Dual Enrollment Committee for strategic planning and implementation of programs. Several new programs have expanded the reach of our dual enrollment program to other science courses and to many non-science and non-STEM courses.

New policies and programs related to dual enrollment have also been implemented, from the local to the state levels, largely because of the positive impact of the (MSP)$^2$ effort. At the state level, recent Maryland legislation (SB 740) now makes it much easier for students to take dual enrollment courses in all subjects, logistically and financially.

Specific practices and materials developed by (MSP)$^2$ continue to be used in the district’s expanding dual enrollment programs.

For example:

✦ **Dual enrollment workshops** for PGCPS teachers and PGCC instructors have emulated the multi-day format, in order to strengthen the relationship-building and teamwork that were so important during the (MSP)$^2$ program.

✦ **The parent engagement strategies** used by (MSP)$^2$ continue to be used to inform and engage support of the parents of dual enrollment students.

✦ **Documents created for the (MSP)$^2$ programs** (applications, handbooks, etc.) continue to be the foundation of dual enrollment interactions between PGCPS and PGCC.

Conclusion

Both types of dual-enrollment program seem to have a positive impact on students’ interest and persistence in STEM disciplines, at least into the first few years of college. However, given the similar impacts of the two programs, **the concurrent-enrollment (in-school) model is significantly more cost effective** than the summer residential program, costing less than a third as much per student.