Responses to Questions 1-5 in the PUMA-STEM College Readiness Workshop packet (adapted from whiteboard notes after small group discussions):

1. ***How should we define "college readiness" in terms of a student being able to graduate from college-level STEM programs?***

   -Need to differentiate academic versus personal issues:
   -Ability to persist
   -Confidence
   -Math skills
   -Writing skills
   -Linguistic skills
   -Test taking skills (without a study guide)
   -No need for remedial course work
   -Critical thinking skills
   -Curiosity
   -An "attitude for education"
   -Metacognition
   -Life skills
   -Study skills
   -Being proactive
   -Time management skills
   -Decision making skills

2. ***What are the most significant barriers to "college readiness" that relate to secondary STEM programming or other pre-college training?***

   -Inability to communicate
   -Inability to seek help
   -Not knowing how much work is required
   -Lack of realistic view of what is needed to succeed
   -Lack of study skills
   -Lack of notetaking skills
   -Lack of preparedness
   -Lack of understanding
   -Lack of continuity across educational stages (K-12 through college)
   -Lack of motivation
   -Excessive distractions
   -Fear of success
   -Fear of failure
   -Social stigma
   -Lack of resources
   -Lack of support at home
   -Fear of STEM
   -"Inherited" fear of STEM or academics (e.g., from parents)
   -Mentality of compliance
   -Reliance on reward

-Teachers judged by a pass rate
-"Oversupport" in K-12 schooling
-Preconceptions of teachers about underrepresented minority students
-Student lack of accountability

3. ***Are barriers to "college readiness" in STEM experienced differently by underrepresented minorities (URMs) in STEM compared to non-URMs (e.g., white students)? If so, what are these barriers and how do you think student experiences differ?***

Generally, the answer was "Yes" to the first question, with comments on the second:
-Lack of familiar role models
-Lack of parental understanding of the value of STEM
-Financial barriers disproportionately affecting URM students
-Lack of family support of loans for higher education
-Responsibilities as a parent
-Responsibilities as a non-parental caretaker
-Responsibilities to family
-Lack of "fitting in"
-Lack of a sense of belonging
-Lack of access to resources
-Teachers' expectations that URMs may underperform

Several participants noted that it may be important or necessary to break out additional characteristics of URM and non-URM students:
-Gender
-First-generation students
-Urban versus rural
-Commuter versus non-commuter
-Four year student versus transfer student
-Athlete versus non-athlete

4. ***Are there certain challenges/barriers (e.g., social stigma, inadequate K-12 academics, etc.) that are experienced to a greater extent within some demographics of URM students compared to others?***

-Undocumented students experiencing greater financial barriers
-Students from some backgrounds/cultures may stay closer to home (spend less time on campus)
-Some URMs may have more non-academic family obligations than non-URMs
-Differences in accessibility of technology (e.g., internet access at home, resources to complete online homework, possession of a graphing calculator, etc.)
-Possession of textbook on the first day of class
-Stigma around changing academic path (proposed barrier in Latino/a families)
-Lack of acceptance from peers

5. ***What are the most important aspects of secondary (i.e., high school) STEM education, in terms of facilitating improved enrollment and completion rates for URMs in college STEM programs?***

-Improving pedagogues
-Improving academic advising
-Teaching students how to get help when they need it
-Teaching what it means to be in STEM
-Communicating to students about what is needed for success in STEM
-Increasing the number of "near peers" (student mentorship)
-Improving continuity of math education (e.g., not skipping math during senior year of high school)
-Increasing exposure to rigor
-Improving student recognition of the need for diligence in STEM
-Improving aspects of advanced placement and dual credit in STEM
-Building interest in STEM
-Building curiosity about STEM
-Emphasizing applied STEM (e.g., engineering) to grow interest and engagement
-Increasing mentorship
-Promoting students seeing themselves as STEM practitioners
-Better teaching of basic skills (reading, writing, note-taking, etc.)

Possible solutions/improvements to the problems being addressed:

-Cohort model
-Peer mentoring
-Building "communities of practice"
-Extracurricular activities may help to promote belonging and success (if time burden is not excessive)
-Bring URM students to college campuses early and expose them to STEM and familiar role models
-Build an open and embracing environment where URM students feel like they belong in STEM