Project Nexus promotes quality science education by developing and testing an exemplary model that prepares and sustains upper elementary and middle level science teachers. The teachers recruited for Project Nexus will benefit from a baccalaureate program that features connecting transformative undergraduate science courses with science method courses, supported internship experiences with adolescent students in informal education contexts, field placements in urban professional development schools and ongoing innovative educational experiences addressing the needs of minority and urban students, and continuous university, public school district, and informal education support during their induction years. Participants in the 5-year project include new specialist science teachers and practicing mentor teachers (formal and informal science education domains).

Rationale
Current need in science teacher preparation

- To increase the number of elementary teacher education majors who concentrate in science, particularly those typically underrepresented
- To increase the number of qualified upper elementary/middle school science teachers, particularly those typically underrepresented
- To provide professional development opportunities for teachers at all levels
- To disseminate the model locally and nationally.

Central Research Question
To what extent of success (and for what reasons) can undergraduate elementary teacher education majors, particularly those currently underrepresented, with demonstrated interest and performance in science be recruited, prepared and supported to teach upper elementary/middle school science in a manner consistent with standards-based recommendations?

Theoretical Perspectives
Identity Theory
The ways individuals see themselves and are seen by others as “a certain kind of person” involves an interweaving of their natural identities (i.e., gender, race/ethnicity), institutional positionality (i.e., licensed teacher, student), engagement in dialogue with others, and shared experiences within groups (Gee, 2000).

Professional Identity Development of Beginning Elementary Teachers of Science: A Comparative Case Study
Phyllis Katz, J. Randy McNinnis, Kelly Reidinger, Gill Marbach-Ad, Rebecca Pease, Amy Dai, Lori Jusiewicz, University of Maryland

Objectives
- To build a new teacher preparation continuum model for upper elementary/middle school science teachers with an undergraduate academic major in science content who can pass standardized exams in their content field.
- To implement this model at the participating HBI and the PWI in partnership with an informal science education program (e.g., Hands on Science Outreach). The model includes the following components:
  - To increase the number of elementary teacher education majors who concentrate in science, particularly those typically underrepresented.
  - To increase the number of qualified upper elementary/middle school science teachers, particularly those typically underrepresented.
  - To provide professional development opportunities for teachers at all levels.
  - To disseminate the model locally and nationally.

Methods
Comparative Case Study of Beginning Teachers

Research Question: How and in what ways do the Project Nexus innovations influence beginning teachers’ elementary classroom science teaching identity development?

Sample: 2010-2012 School Year: Pre- and Post-Project Nexus graduates (HBI & PWI) = 20 university of Maryland graduates for comparison (Michela & Brandon).

Data Collection: Bruner: (hands on science outreach) pre- and post- graduates' science teaching attitudes and beliefs framework: and beliefs about teaching science in the classroom (pre- and post-); Science Teaching Identity: Pre- and Post- science teaching identity framework: and beliefs about teaching science in the classroom (pre- and post-);

Instrumentation: Pre- and Post- science teaching identity framework: and beliefs about teaching science in the classroom (pre- and post-);

Methodology: Comparative Case Study (Descriptive Study) + Quantitative (Identity Framework, Inductive Analyses)

Analysis: To analyze the drawings, we examined them for evidence in regards to the 6 strands explicated in two recent NRC documents [Taking Science to Schools: Learning and Teaching Science in Grades K-8 (2007)] & Learning Science in Informal Environments: People, Places, and Pursuits (2009). We developed a detailed rubric and used an inter-rater reliability check.

Findings
Rachel (Treatment, African American Female)

- 1 year post the Baccalaureate Program: Rachel identified as a teacher that teaches all subjects, not necessarily just science.

- Rachel identifies as a teacher that teaches all subjects, not necessarily just science.

- She views herself on a continuum and reflects on her progress.

- Wants to be a teacher that teaches all subjects, not necessarily just science.

- Wants to be a teacher that teaches all subjects, not necessarily just science.

- Wants to be a teacher that teaches all subjects, not necessarily just science.

- Wants to be a teacher that teaches all subjects, not necessarily just science.

Survey data (Selective)

- Rachel identifies as a teacher that teaches all subjects, not necessarily just science.

- Wants to be a teacher that teaches all subjects, not necessarily just science.

- Wants to be a teacher that teaches all subjects, not necessarily just science.

- Rachel identifies as a teacher that teaches all subjects, not necessarily just science.

- Wants to be a teacher that teaches all subjects, not necessarily just science.

- Rachel identifies as a teacher that teaches all subjects, not necessarily just science.

- Wants to be a teacher that teaches all subjects, not necessarily just science.

- Rachel identifies as a teacher that teaches all subjects, not necessarily just science.

- Wants to be a teacher that teaches all subjects, not necessarily just science.

- Rachel identifies as a teacher that teaches all subjects, not necessarily just science.

- Wants to be a teacher that teaches all subjects, not necessarily just science.