

Project Summary

This is a Full Research and Development proposal which addresses the Contextual Challenge: How can the learning of significant STEM content be achieved to ensure public literacy and workforce readiness? Our nation is failing to prepare millions of youth for meaningful and productive participation in an information-based society. The target population are those students performing in the bottom quartile on state and national tests, many of these are children of color living in under resourced communities, and most of these young people do not finish high school and end up diverted into an underground economy, gangs, and prisons.

This project addresses this failure by further developing and testing an approach that the Algebra Project is developing for high school mathematics, in which students form a cohort that stays together for all four years of high school, study mathematics every day using project-designed curricular materials with teachers who participate in project professional development, and are supported by local community groups.

The Algebra Project seeks to stimulate a demand for math literacy in those most affected by its absence -- the young people themselves. It stresses the importance of peer culture, using lessons learned from experiences in the 1960s Civil Rights Movement, as well as in the emergence of project graduates into a group with their own perspectives and initiatives.

In the 60s, project founders learned how to use the meeting place as a tool to engage and empower the people that the meeting was intended to serve. In the proposed project, there are two meeting places: the students' high school mathematics classroom and supplementary education activities; and the network of sites around the country that are communicating and learning how to develop and implement cohorts. Young peoples' roles in each of these settings are key to creating the motivation and commitment needed for student success as well as developing local interest. The combination of classroom and professional development work, innovative curriculum materials, and community involvement creates an intervention that can significantly transform the peer culture, even in the face of negative forces.

The Algebra Project has developed a cohort model that we predict will stimulate and enable students to pass the state and district mandated tests in mathematics, to pass the mathematics portions of any graduation test, and to score well enough on the SAT or ACT to enter college, and to place into mathematics courses for college credit (not remedial courses). Building on previous awards, the project will continue to research and develop the cohort model, and will create a small network of cohorts to establish that our model can be widely successful.

Intellectual merit: This project will demonstrate how students entering high school performing in the bottom quartile nationally and state-wide can be prepared for college-level mathematics, using lessons learned from many years of past experience working in such communities and in their middle schools, and more recently in their high schools and in collaboration with university mathematicians. The research results are critical to the nation's learning how to improve mathematics achievement for all children – to gaining a sense of what such a program “looks and feels like”, and what resources and commitments are required, from which institutions.

Broader impact: The results of this discovery research project will advance understanding of how to improve mathematics learning and achievement in low performing districts, so students are prepared to take college mathematics without repeating high school mathematics in early college. It will also demonstrate the resources and commitments needed to reach this result.