

E-NEST: Enhanced Noyce Explorer, Scholar, Teacher Development for High-Need Schools in New York City

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Overview

The Noyce project at City Tech is supported through the Robert Noyce Teacher Scholarship program and has partnered with the Borough of Manhattan Community College (BMCC) to implement this program. This is the Phase II of the NSF Noyce project. The main objective is to address the problem of the STEM teacher shortage in the United States, specifically in New York City. The program's mission is the development of K-12 New York State certified Science, Technology, Engineering and Mathematics teachers, mainly in Technology and Mathematics fields.

Training for pre-service STEM teachers involves a variety of teaching internships, scholarships and summer program workshops and is based upon the successful previous Noyce program. Using the Engagement, Capacity, and Continuity Trilogy model, this program expands the impact of student experiences in STEM education. The vision of this project is to contribute to a systemic educational infrastructure that provides high quality STEM education that will prepare students to become effective teachers of tomorrow.

This is year 2 of the second National Science Foundation Noyce Scholarship grant awarded to City Tech, officially starting in Spring 2020 under pandemic conditions. The total budget awarded to City Tech was \$1,444,398 starting May 1, 2020 until April 30, 2025. In the past year and a half, approximately 100 CUNY students have been recruited for internships, scholarships and summer programs. The program's goal is to recruit and train a total of 25 K-12 STEM teachers in this five-year grant period.

Our first National Science Foundation Noyce Scholarship grant with a total budget of \$1,418,976 ran successfully at City Tech from January 1, 2014 until December 31, 2019. This first grant resulted in the development of 20 talented K-12 STEM teachers to teach in local high-need school districts to address the chronic shortage of STEM teachers and involved over 600 Noyce interns and summer program students. The harmonious collaboration among City Tech, BMCC, local New York City public schools and the external evaluator created a solid administrative environment and maximized the efficiency of this program.

Year 2 Activities

Multiple Noyce information sessions have been held remotely throughout the Spring and Fall 2021 semesters to recruit new interns and scholars. Additionally, remote Noyce workshops have been organized in the Spring, Summer and Fall 2021 semesters to train existing interns and scholars and to give them the opportunity to share their teaching experiences with potential students and reflect with their peers about Noyce experiences.

In Spring 2021, remote teaching internships were offered at New York City public middle schools and high schools. In Summer 2021, the annual Noyce Summer Program was held remotely presenting STEM and Education topics. Noyce interns and scholars participated in the workshops where topics included were: Implement Online Hands-on Embedded System Project at Virtual Classroom, Data Literacy and Problem Solving, Classroom Case Studies, An Exploration of Cryptography and its Applications and Logical and Mathematical Underpinnings of Computers.

Mentorship meetings with STEM and Education professors and Noyce

teacher support meetings further helped Scholars advance their studies. Beginning in Fall 2021, interns were placed at in-person teaching internships at I.S. 220 and George Westinghouse Career and Technical Education high school.

Spring 2021

- Noyce information sessions
- Noyce training workshops
- Intern and Scholar recruitment
- Remote teaching internships
- Scholar mentorship meetings

Summer 2021

- Noyce Summer Program recruitment
- Noyce Summer Program (May 26, 2021 to June 4, 2021)
- Noyce Program Evaluation by Professor Gordon Snyder in June 2021

Fall 2021

- Noyce information sessions
- Noyce training workshops
- Intern and Scholar recruitment
- In-person teaching internships
- Scholar mentorship meetings
- Noyce Teacher support workshops

Results

Beginning in Spring 2020 until present, there have been approximately 100 CUNY students at City Tech and BMCC involved in Noyce internships, scholarships and summer programs. This is the first half of the second year of the Noyce NSF project. So far, we have recruited 6 new Noyce scholars who are in the process of training to become K-12 Mathematics and Technology teachers and 100 Noyce interns and summer program students.

Conclusions

With the E-NEST project officially starting on May 1, 2020 under pandemic conditions, the project team has still been able to offer expansive internships, scholarships and workshops to Noyce students. The program evaluation was conducted by the external evaluator, Professor Gordon Snyder from Pace University. The Evaluator concludes that confidence in the E-NEST project remains high and that based on observations, this project will continue to flourish.

This is a continued success from the first National Science Foundation Noyce grant. The overall feedback for the Noyce project is positive and in an ongoing improvement phase. The program has gained success in getting potential teachers started on the path to obtaining their degrees and certifications for STEM teaching in either Technology Teacher Education or Math Education fields. The Noyce project intends to keep increasing the number of students who will pursue a career in STEM teaching.

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3. NSF Noyce project grant number: 1340007 Amount: \$1,418,976 Period: 1/1/2014 - 12/31/2019