

Proposal Abstract

Yonkers Public Schools' proposed 2015-2018 Learning Technology Grant Project, ***Maker Space: Science Inquiry***, captures essential questions of enduring interest to teachers and students alike: How do engineers develop solutions to problems? How can we use a maker space to solve problems in our school and community? The project is designed to establish the very first Maker Space for secondary students in Yonkers Public Schools in which librarians work in collaboration with teachers and students in grades 9 and 10 at **Roosevelt High School Early College Studies (a Priority school)**, **Riverside High School**, and the non-public **Biondi Education Center at Leake and Watts**, to engage students in STEAM—Science, Technology, Engineering, Arts, and Mathematics—concepts.

A Maker Space is a physical space where students, teachers, and librarians share resources and knowledge through the use of a variety of technologies to create, invent, and solve problems while learning (Educause, 2013). In the process of sharing resources and knowledge, students will solve problems and design projects through hands-on exploration. “Makerspaces have become arenas for informal, project-driven, self-directed learning, providing workspace to tinker, try out solutions, and hear input from colleagues with similar interests” (Educause, 2013, p. 1).

The main objective of this project is to increase students' content knowledge in Science and ELA by engaging students in the Engineering Design Process (TeachEngineering, nd) to identify and design solutions to problems in their school and community, using technologies available in a Maker Space. This project will also **develop highly effective teachers by supporting school library leadership in educational technology,** and by **building the capacity of educators to design innovative, standards-based learning experiences for students.**

Librarians from the three schools will play a critical role in working with teachers and students to develop Maker Space projects. School librarianship has evolved from emphasis of library skills to teaching inquiry as a way of learning in the 21st century. Research shows that school librarians, acting as technology and learning consultants, can create high-tech dynamic centers for learning (Johnston, 2012; Kuhlthau, 2010). Librarians will partner with Science teachers to act as an educational technology resource and support the development of students' Maker Space projects using a wide variety of appropriate technology (e.g., paper circuits, 3D design tools, Lego Mindstorms EV3, iPads, laptops).

In a Maker Space, students will learn to think like engineers and understand how the Engineering Design Process can be applied to solve problems in their school and community (TeachEngineering, nd). This project will help students understand how engineers think and engage in problem solving, as they identify, research, and design solutions to real problems in their school and community, while also developing students' writing and communication skills via the **NYS Learning Standards, NYS Common Core Learning Standards (CCLS), and Next Generation Science Standards (NGSS).**

Onsite facilitators from the **Center for Technology and School Change (CTSC) at Teachers College, Columbia University** will provide a series of after-school professional development workshops to support librarians and teachers in integrating the technology and designing student-centered, authentic Maker Space projects. Using a project-based approach, participants will come to understand their unique role as designers of innovative student learning experiences. CTSC facilitators will follow the workshops with a series of onsite visits to each school to provide in-class modeling and coaching as the participants implement the standards-based Maker Space projects and reflect on students' understandings.