Chapter 79

Integrated Projects and the Development of Interdisciplinary Problem–Solving Strategies

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ABSTRACT

Interdisciplinary problem solving and research skills require early preparation in two categories: critical thinking and communication. This chapter reviews the two-year process of interdisciplinary curriculum development, shaped by collaboration between the New York City Department of Education, the New York City College of Technology of the City University of New York, and City Polytechnic High School of Engineering, Architecture, and Technology. The resulting course, "Inter-Academy Integrated Projects" (IP), emphasizes multidisciplinary problem solving that includes creativity, observation, research, visual and discursive communication, and reflection. The collaborative lessons make use of project-based methodology and emphasize social responsibility. Core skills are combined across the two trimesters of IP. This endeavor will be contrasted and compared to the work of the Partnership for the 21st Century Skills by examining the use of high-impact learning practices, feedback from students and teachers, and the issues surrounding the implementation of any new curriculum.

ORGANIZATION BACKGROUND

City Polytechnic High School (City Poly) of Engineering, Architecture, and Technology is one of four State-approved Career and Technical Education (CTE) demonstration sites in New York City and has been named as one of 10 schools in New York City Chancellor Joel Klein's 21st Century Schools Initiative. The unique format of this CTE school is a 3 + 2 program in which students complete a full 4 years of high school learning in a three-year period followed by two additional years of college-level work at New York City College of Technology (City Tech). Successful candidates would then earn an Associate's degree.

With no scholastic admissions requirements, City Poly serves a predominantly minority and disadvantaged cross section of New York City High School students providing opportunities for college study and career pathways in engineering, architecture and technology related fields. City Poly opened its doors to its first 130 students in September 2009 and in the Fall of 2011 completed its second full year, run three summer programs and will be welcoming its third group of incoming freshman.

The City Tech-City Poly collaboration consists of members of the City Tech administration including the provost, City Poly faculty and principal, architectural technology and civil engineering technology faculty; CUNY's Early College Initiative; and the National Academy Foundation, which operates over 500 career academies in high schools nationwide. Funding for the project is through the Department of Education (DOE), CUNY and the Tortora Sillcox Family Foundation (see Figure 1).

A major initiative of this collaboration and the focus of this chapter is the development of two courses entitled Inter-Academy Integrated Projects (IP) whose curriculum was developed by two City Tech professors and licensed professionals one an Architect and the other a Civil Engineer.

Philosophy

Prior to commencing the curriculum development process, time was spent conceptualizing and identifying the underlying philosophical goals that would guide its development. While the mode of delivery would utilize Architectural and Engineering models, the goal is not to train the next generation in these fields but instead to apply a particular way of thinking to the problem solving process while exposing high school students to a wider range of career choices at an early point in their education. Students are considered equally successful whether or not they chose a career in the specialized areas offered by City Poly.

A primary focus is to weave the common skill set of Architect and Engineer, from complex critical thinking, to problem solving and collaborative learning, to the simple but necessary skill of listing or the ability to communicate and express ones ideas through oral, written, and graphic presentations into a logical project-based sequence. The goal here is not so much to find a specific answer to a given question but to focus on the problem solving process itself so as to develop the flexibility to apply this methodology to a wide range of situations. The curriculum looks to develop critical

Figure 1. Organizational diagram
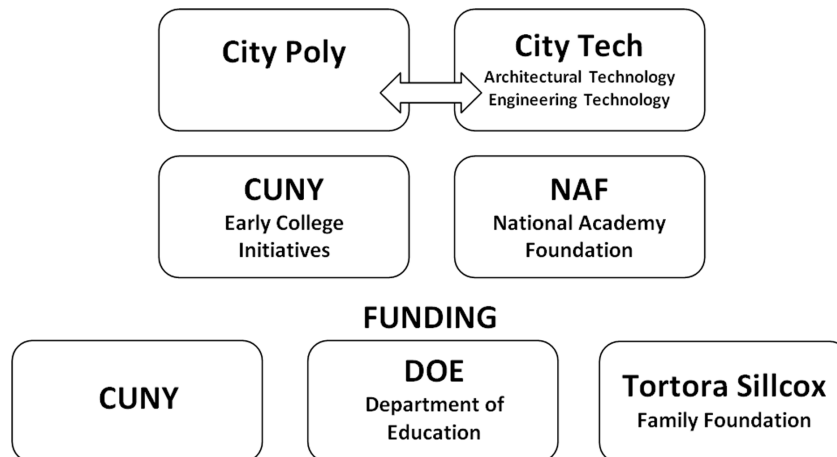
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