STEAM Center of Learning

The building as the teaching tool for STEAM education

Erica Cochran Hameen

"Intelligence plus character that is the goal of true education." – Dr. Martin Luther King Jr.

QUESTION

How can the built environment drive innovations in science, technology, engineering, architecture, and mathematics, while also fostering diversity and inclusion?

How can we use the school building as a teaching tool to engage and inspire future architects at a young age?

PROMPT

A well-rounded education provides tremendous opportunities. School facilities are not just spaces for education, they are places where people can learn, enhance, and develop their understanding of the world, make friends, play, explore, create, grow, secure a better income, develop critical thinking, and use their imagination to make the impossible **possible**.

"To be truly visionary we have to root our imagination in our concert reality while simultaneously imaging possibilities beyond that reality. – bell hooks
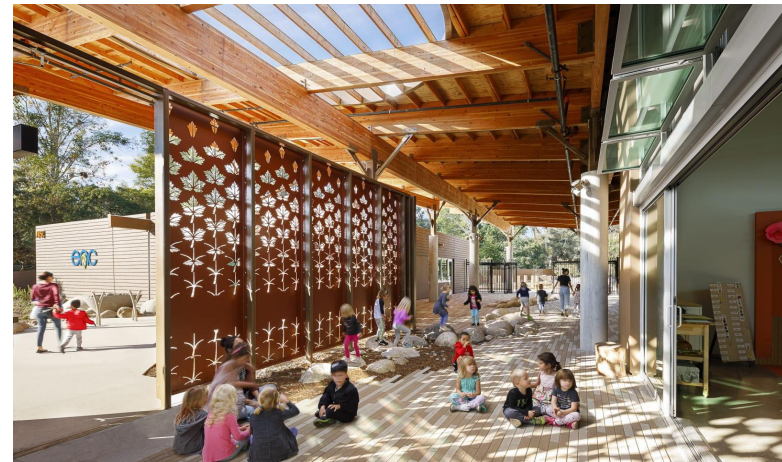
Environmental Nature Center / Bo Glover, Newport Beach, CA. Architect: LPA, Inc

CONTEXT

The class will commence with an engaging and interactive process where will we evaluate the role architecture plays in bolstering young people's interest in Science, Technology, Engineering, Architecture, and Math (STEAM). We will assess creative design solutions that facilitate ways to use the school building as a teaching tool for interactive, immersive, and enjoyable learning.

Lick-Wilmerding High School, San Francisco, CA. Architect: EHDD

Louisiana Children's Museum, New Orleans, LA. Architect: Mithun, with associate architect firm Waggonner & Ball

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Team Structure

Based on the number of students in the class, we will divide into three-person teams and potentially a single four-person team. The suggested team responsibilities are one person per team shall serve as the project manger for structure, enclosure, MEP and documentation. The team project managers are ultimately responsible making team assignments and producing the deliverables throughout the semester.

Field Trips

- Assemble, a community space for Art + Technology
- The Carnegie Science Center
- The Children's Museum and the Museum Lab
- Phipps Center for Sustainable Landscapes, the Exhibit Staging Center, and th Nature Lab

PROGRAM

This semester, we will explore the critical role that K-12 schools play in society and the role architecture can play in enhancing STEAM education and providing equitable sustainability. K-12 school buildings house one of the most vulnerable demographics: children. In the United States, students in elementary and high schools spend, on average, 1,400 hours in school buildings every year, engaging in learning, playing, eating, and interacting with one another. This studio will focus on architectural design strategies for elementary school buildings to serve as places for interactive and immersive learning. Students will work in teams of 3 or 4, focusing on Technology, Engineering, Architecture, and Math (STEAM) learning, where the building serves as a teaching tool for K-5 grade students.

LEARNING OBJECTIVES

The objective of this studio is to explore and demonstrate the necessary integration within the structural system, building envelope, environmental control systems, and life safety systems while delivering measurable outcomes of building performance and occupant well-being as integral parts of the design process. Consultant Engineers will play active roles in the studio process, providing expertise and engaging in discussions resembling professional practice.

Throughout the semester, students will collaborate with several key stakeholder groups, focusing on education, equity, sustainability, and planning. These stakeholders include Pittsburgh community leaders, officials from Allegheny County and the Pittsburgh Government, as well as leaders from the Pittsburgh Architecture Learning Network (ALN). The ALN encompasses leadership from the ACE High School Mentorship Program, Assemble, CMU School of Architecture, the Carnegie Museum of Art, Fallingwater, Pittsburgh History and Landmarks Foundation, the University of Pittsburgh Architectural Studies Program, Chatham University Interior Architecture, the National Organization of Minority Architects (NOMA) PGH, and the Young Preservationists Association of Pittsburgh.

Through design exploration and in collaboration with architecture and engineering consultants, as well as key stakeholder groups, students will create an engaging and exciting STEAM-focused elementary school. This school will be culturally sensitive, equitable, inclusive, energy-efficient, environmentally responsive, and designed to foster interest in STEAM.

"Let us remember: One book, one pen, one child, and one teacher can change the world."—Malala Yousafzai

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