# Curriculum Evaluation of the Academy of Global Logistics Program: Connections to STEM Education

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## Introduction

On their daily commutes to and from the Academy of Global Logistics (AGL) at Cabrillo High School, many do not realize that the Port of Long Beach is 4.5 miles away on the coastal horizon. AGL ensures that students can see promising supply chain and logistics career opportunities on their professional horizons. AGL was launched in 2016 through a partnership between the Long Beach Unified School District and the Port of Long Beach. Such industry-education partnerships have the potential to make a significant impact in capacity-building of a skilled labor force. Examining the connections between AGL and STEM learning is important to gain a deeper understanding of these pedagogies and how they serve students by supporting student learning and developing a capable workforce.

The California Governor's 2023–2024 budget dedicates $1.65 billion to advancing workforce development programs. The budget also includes an industrial economic agenda that commits to offering grants for workforce development programs. To respond to the blend of Career Technical Education (CTE), STEM, and project-based learning needs required to prepare future generations for the fourth industrial revolution's technological and socioeconomic megatrends, programs similar to AGL are essential.

## Study Methods

The research team sought to contextualize AGL in national CTE history. Doing so highlights the strengths of the AGL program that respond to demands of the labor market and inform future directions for workforce development. The team also sought to examine AGL curriculum to identify the mathematic and scientific practices in the curriculum. Lastly, the team sought to examine how much of the AGL curriculum adheres to project-based learning criteria. Establishing these connections provides the foundation for future efforts to build upon the AGL model.

This project identified the elements meeting Next Generation Science Standard (NGSS) practices, Math Common Core practices, and project-based learning criteria in each course unit. The team expected that the AGL curriculum would incorporate many, even all, of the practices required by CA state standards and project-based learning criteria.

## Findings

Across the three courses, the NGSS practice that students were expected to engage in most frequently was "obtaining, evaluating, and communicating information". The practice students engaged in the least frequently was "planning and carrying out investigations". The wide range of engagement is likely due to science placing a greater emphasis on hypothesis testing than a business/finance curriculum would. The Common Core practice most present was to "reason abstractly and quantitatively". The two practices expected of students least frequently were to "attend to precision" and to "use appropriate tools strategically". This is likely due to differences in expectations of precision and what tools are considered when learning mathematics versus business/finance. For project-based learning criteria, students were expected "to communicate" most frequently. Least frequent opportunities were "to pursue ideation/ generation many ideas," "to engage in metacognition," and "to test and refine ideas". The remaining project-based learning criteria were met fairly often. This is likely due to the nature of CTE being grounded in exposing students to real-world situations.

## Policy Recommendations

Logistics and supply chain as thematic foci allow for the contextualization of STEM learning and the creation of a highly interdisciplinary approach to STEM, including opportunities for engineering and geospatial and computational thinking. Ultimately, AGL can be a STEM for all environment that include CTE and academic pathways. One suggestion for future efforts is to consider the overlap across the mathematics practices, the science practices, and even project-based learning, and to include explicit discussions on the differences in fields of study as well as postsecondary classrooms versus the workplace. By exploring these differences, students will reflect on their thinking and behaviors in those diverse situations. This is expected to contribute to the development of metacognition and critical thinking skills. Policymakers can support the growth of programs such as AGL in two ways. First, providing funding for additional CTE teachers in schools where CTE programs such as AGL will benefit the local economy and the economic development of the state. A second area is to create and encourage programs that develop such industry and education partnerships.

## About the Authors

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For more details about the study, download the full report at transweb.sjsu.edu/research/2246