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“Latina/o Students: Policy, Assessment and Academic Preparation for Success”

Session: Policy, Assessment and Academic Preparation: Facilitating Student Success

Title: Promoting Mathematics Education in Dual Language Education Programs in Spanish Towards a Growing Understanding of Engineering

Presentation Description (50-75 words)

This work addresses the lack of a national guidance for the integration of mathematics and engineering in the Dual Language Education (DLE) programs in Spanish. Participants will learn about the impact of DLE programs on Latina/o students, and explore potential guidelines and strategies to implement mathematics and engineering in DLE schools. Educators and program developers, advocating for the integration of STEM knowledge in DLE programs in their district(s)/school(s), would particularly benefit from this session. (74 words)

Presentation Plan:

Research has shown the impact of early education in academic achievement and career goals. The differentiation in terms of students' academic achievement and career goals begins to separate student groups since early grades especially on the basis of their race, SES, and first language. Latina/o students, particularly if from low-SES, are often underrepresented in school and college graduation rates and STEM career employment. Dual Language Education (DLE) programs in Spanish have been rapidly developing in the country in the last decades, with the goal of promoting academic achievement, bilingualism and biculturalism, and cross-cultural relationship.

The long-term vision of this research project is to promote the inclusion of Latinas/os in education starting from the earlier grades. Engineering is an essential skill to present to children from early age to expand their critical thinking and application of science, technology, and math. Guidelines and principles to implement engineering in early grades are not often available to teachers, especially those teaching Spanish in a DLE school. Differentiating mathematics and engineering instruction for students from

Latina/o background in the early elementary grades hasn't been developed from a systematic perspective and from an epistemological lens.

In this session, we present the results of a qualitative research approach. We will focus on what kind of instrument teachers use to teach mathematics in a Spanish third-grade DLE class in the Northeastern U.S. We will explore what kind of guidelines exist for teachers in DLE programs in Spanish to integrate mathematics and how these guidelines may lead to a grown understanding of engineering, with the simultaneous development of both English and Spanish language skills. First, we seek to understand how teachers integrate mathematics in a third-grade DLE class. Second, we want to understand the need of these teachers and support their professional development through appropriate intervention.

To better involve the participants, we will present the findings of our study through handouts, manipulatives, and pictures from the field, and online resources. The participants will also have the opportunity to share their experience related to mathematics and engineering learning in the regular K-12 environment and in unofficial spaces, and confront them with the guidelines and instructional strategies emerged from the study.