Environment as the Integrating Context for Learning (EIC)

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Abstract

This study conducts a research of how to implement intrinsic motivation among elementary grade-level students by incorporating place-based learning in elementary schools. Ideas such as facilitating a student-led math walk, going on nature-walks, and taking "field trips" by inviting outside resources into the classroom and other methods to promote inquiry-based learning. By designing student-led nature walks, or "field trips" students can apply math to real-life situations they care about.

Introduction

In spite of our current pandemic situation in schools, students are confined into limited spaces more than ever which hinders them to explore beyond their limitations. Although field trips are not within reach in the moment, an alternative to developing motivation and inquiry-based learning is to promote Nature Walks. Doing so will help students apply many integrated subjects across the curriculum. Math/Nature Walks may be conducted at home/classroom/ school campus.

Research Question

What are ways to reinvent teaching math within today's circumstances in the classroom?

Hypothesis

If Nature Walks are permitted in the classroom, then students will be more motivated to learn because it provides inquiry-based learning and applied math and other subjects to make meaningful connections tailored to student's interest.

Research Design & Data Collection

Environmental education is a practice that students do in China. Countries such as China as well as the U.S. practice what is called Environment as the Integrating Context for learning (EIC). "EIC-based learning is not primarily focused on learning about the environment nor is it limited to developing environmental awareness. It is about using a school's surroundings and community as a framework within which students can construct their own learning, guided by teachers and administrators using proven educational practices." (16)

What might Nature Walks/ EIC look like?

- Putting mathematics into everyday perspective
    - Matching everyday objects to general shapes
    - Using nature to teach geometry and symmetry
- Noticing authentic problems surrounding the school/ community and its effects
    - For schools that near a beach…
        - you might think about problems/ projects about sustaining native plants and animal species
    - For schools in urban areas…
- Conducting "field trips" by inviting outside resources and guests to share and conduct experiences with the class
- A combination of integrated subjects to solve a common goal

Results

A table is shown from an article "Closing the Achievement Gap" by Gerald A. Lieberman and Linda L. Hoody. Studies and EIC has been conducted all across America. In a case study from 40 schools in the U.S, EIC approaches have shown positive outcomes in making math engaging and meaningful to learners of all ages. "92% of educators responding to the Learning Survey reported that using EIC approaches improved math learning when compared to traditional methods." (48)

TABLE 9. Summary of Learning and Domains Surveys on Mathematics.

Learning Survey Items	% of Educators Reporting Student Improvement	# of Educators Responding to this Survey Item
Learning of math	92%	137
Domains Survey Items		
Knowledge: content, concepts, and principles	73%	92
Skills: processes and application to real situations	93%	94
Retention of knowledge and skills	78%	83
Attitudes: engagement, enthusiasm, and interest	89%	94
Opportunities: context and content for learning	96%	91
Average for Math Domains Survey	86%	91

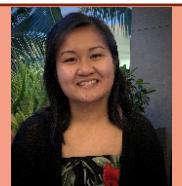
Discussion

Based on the different resources that were researched, a commonality in positive traits and retention in students actively engaged in issues they care about. EIC is student-centered and learning-centered in which the teachers oversee students engaging in the ownership of their learning. Behavior management and attendance in classrooms improved as well.

Conclusions

Reinventing teaching math towards an EIC approach allows students to:

- Explore authentic problems within their surroundings that are student-driven with the intent of resolving it .
- Develop problem-solving skills , public speaking skills, collaboration skills, hands-on approach
- Normalize the practice to teach students how to be an active contributor to society at an early age
- Apply subject course content and disciplines to everyday life
- Student enthusiasm and engagement, pride and ownership



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