STEAM Training: Environmental Transformation in Schools using GLOBE protocols

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⬦ ENVIRONMENTAL EDUCATION   ⊕ GLOBE PROTOCOLS

Summary

This research proposal presents an innovative STEAM-based teacher training program utilizing GLOBE protocols to transform science education in middle schools in Pinheiro, Maranhão, Brazil. By focusing on the Pericumã River's environmental challenges, the program bridges theoretical knowledge with practical, community-relevant application. Teachers will become equipped to guide inquiry-based, data-driven activities centered on water quality analysis, transforming both educators and students into citizen scientists who generate valuable environmental data while fostering environmental stewardship aligned with national educational guidelines and Sustainable Development Goals.

Research Goals

- Implement targeted STEAM workshops for middle school educators
- Evaluate impact on teachers' pedagogical practices and self-efficacy
- Assess student engagement with local sustainability challenges
- Establish a mentorship network for long-term curriculum integration
- Generate actionable environmental data for community benefit

Methodology

Mixed-methods approach combining quantitative surveys, qualitative interviews, and classroom observations to measure program effectiveness

Training

Hands-on workshops focusing on GLOBE water quality protocols, inquiry-based pedagogy, and data analysis techniques

Implementation

Teachers apply learned methods in classrooms, conducting field studies of Pericumã River water quality with students

Evaluation

Continuous assessment of teacher confidence, student learning outcomes, and community environmental impact

Enhanced Teacher Capacity

Increased pedagogical confidence and technical skills in implementing inquiry-based, data-driven STEAM activities that connect classroom learning to real-world environmental challenges

Improved Student Engagement

Heightened motivation and deeper understanding of local sustainability issues through active participation in citizen science and environmental monitoring projects

Community Empowerment

Actionable environmental data for Pinheiro, fostering informed decision-making and strengthening the connection between education and community environmental stewardship

Sustainable Integration

Establishment of mentorship networks and institutional support systems ensuring long-term curriculum integration aligned with Brazilian educational standards and SDGs