KISSCE - ENGAGEMENT

Evidence in Action

A K20 Center Research Brief

An Australian-Based Authentic Science Research Programme Transforms the 21st Century Learning of Rural High School Students

Louise Puslednik and Patrick C. Brennan

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Introduction

This intervention brief explores the impact of an authentic, hands-on science research program on rural high school students' science skills and career aspirations. The authors highlight the decline in STEM skills and interest among Australian students, emphasizing the need for innovative educational approaches. The research problem centers on the effectiveness of authentic science research programs in enhancing students' science skills and motivating them to pursue STEM careers. The significance of the research lies in addressing the educational disparities between rural and metropolitan students and providing evidence for the pedagogical benefits of such programs.

Methodology

Research Design:

The study employed a mixed-methods approach, combining quantitative and qualitative data to evaluate the impact of the intervention.

Sample:

Nine Year 10 students from a rural high school participated in the program. These students were selected based on their high academic performance in science, mathematics, and English.

Data Analysis:

The study utilized the NSW Department of Education VALID assessment scores to compare the intervention group with a control group. Additionally, students completed self-assessment surveys to evaluate their growth in various science skills.

Results

The intervention group demonstrated significantly higher overall VALID assessment scores compared to the control group. Specifically, the intervention students showed greater gains in knowledge and understanding of science, planning, designing and conducting experiments, and problem-solving and communication skills. The students' self-assessment surveys also indicated significant growth in their science skills, including statistics, data analysis, scientific writing, and experimental design.

Application into Practice

To replicate this intervention, schools should consider the following steps:

1. **Develop Partnerships:** Establish strategic partnerships with universities and research institutions to provide students with access to academic mentors and research opportunities.
2. **Selection Criteria:** Identify high-achieving students based on their academic performance in science, mathematics, and English.
3. **Program Design:** Create a structured program that includes weekly tutorials, hands-on research activities, and opportunities for students to engage with real-world scientific problems.
4. **Mentoring:** Ensure close mentor relationships between students and academic researchers to provide guidance and support throughout the research process.
5. **Evaluation:** Utilize standardized assessments and self-assessment surveys to measure students' growth in science skills and overall academic performance.

By implementing these steps, schools can enhance the science skills and career aspirations of rural high school students, fostering a new generation of scientists.

Work Cited

Puslednik, L., & Brennan, P. C. (2020). An Australian-based authentic science research programme transforms the 21st century learning of rural high school students. *Australian Journal of Education, 64*(2), 98–112. https://doi.org/10.1177/0004944120919890