

# *The Native Science Connections Research Project*

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Presented by:

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# Research Participants

The National Science Foundation

Northern Arizona University

Navajo Nation

Hopi Tribe

Zuni Tribe

San Carlos Apache Tribe



# THE PROCESS

- Identify the need or the problem you are seeking to address
- Identify goals, objectives and outcomes
- Develop the Hypothesis



# Native Science Connections

## HYPOTHESES

- 1) that Native American Students will better learn the Science curriculum in schools if they are also grounded in their own “native” Science concepts and related cultural knowledge;
- 2) and after exposure to the Native Science Supplemental Curriculum, students will acquire positive attitudes towards Science and Science education.



# Research Methodology

- DEVELOPED PARTNERSHIPS:
  - Maintained a Trusting Relationship with the Tribes
    - Obtained the “blessings” - oral permission
    - Obtained written permission
      - Chairmen
      - Tribal Councils
      - Department/Office of Education
  - Obtained Permission from the Participating School Districts & Schools
  - Obtained Written Permission from the Students and their Parents



# Accountability

- Quarterly Reports:
  - Tribal councils, school boards, superintendents, principals and teachers, and NSF
- Institutional Review Board (IRB)
  - Permission to conduct research in the classrooms
- Tribal Cultural Preservation Office



# Overview

- Phase I:
  - Teacher Training
  - Curriculum Development
- Phase II:
  - Field Testing in the Classrooms
- Phase III:
  - Research Dissemination
- Phase IV:
  - Follow-up



# Native Science Supplemental Curriculum

- Hired Native doctoral graduate students from each tribe.
- Consulted with:
  - Tribal elders
  - Tribal medicine men and women
  - Tribal cultural experts
  - Tribal curriculum centers
  - NSF



# Science Curriculum Selection

- Full Option Science System (FOSS)
  - Cooperative learning and hands-on model
  - Culturally appropriate for Native American Students
  - National Science Education Standards
  - “Food and Nutrition Unit”
    - Health problems related to poor nutrition
    - Contributes to the well being of students, families and local communities



# Teacher Training

- All teachers received training on how to teach science using FOSS.
- Teachers (experimental group) received training on how to develop, integrate and teach the Native Supplemental Science Curriculum which integrated native language, traditions and culture.

# Research Design

## Quasi Experimental Design

- Experimental Group (FOSS+NSSC) 01 X 02
- Control Group (FOSS only) 01 02

01 = pre-tested subjects/classrooms

02 = post-tested subjects/classrooms

X = Treatment/NSSC



# Data Collection

## QUANTITATIVE DATA:

- Children's Achievement Test
- Science Attitude Inventory

## QUALITATIVE DATA:

- Interviews      Photos
- Journals      Observational Fieldnotes



# Student Outcomes

- The research demonstrated improvement:
  - Student academic science achievement
  - Student attitudes towards science
- Additional Findings:
  - Improved math scores
  - Transferability: Middle school implementation
  - AYP (NCLB – Adequate Yearly Progress)



# Outcomes Based on this Research Model

Navajo Nation:

\$10 million NSF Research Grant  
(Navajo Nation Rural Systemic Initiative)

Twenty-Nine Palms Band of Mission Indian  
Tribe:

Develop a model integrating native cultural science into current EPA risk assessment paradigms.



For Additional Information

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