



Bowhead whale cow and calf in Arctic Ocean
Photo courtesy NSB Dept Wildlife Management

Exposing students to local and culturally-relevant scientific research as a means of increasing student interest in science

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Scientists and subsistence hunters cooperating in data collection

Purpose

The intent of this project was to increase student interest in science and possibly develop interest in a science career. Students were exposed to local and culturally-relevant research involving the use of genetics for studying local whale populations. Alaskan Natives, or the Inupiat Eskimo who make up about 2/3 of the community, participate in subsistence whaling. Thus, this scientific research provides high relevance value to their lives and their culture.

Research Questions

Focus Question:

How can I increase student interest in science classes at this tribal community college and encourage students to pursue science as a career?

Sub-questions:

Will exposure to locally-based, culturally-relevant science research

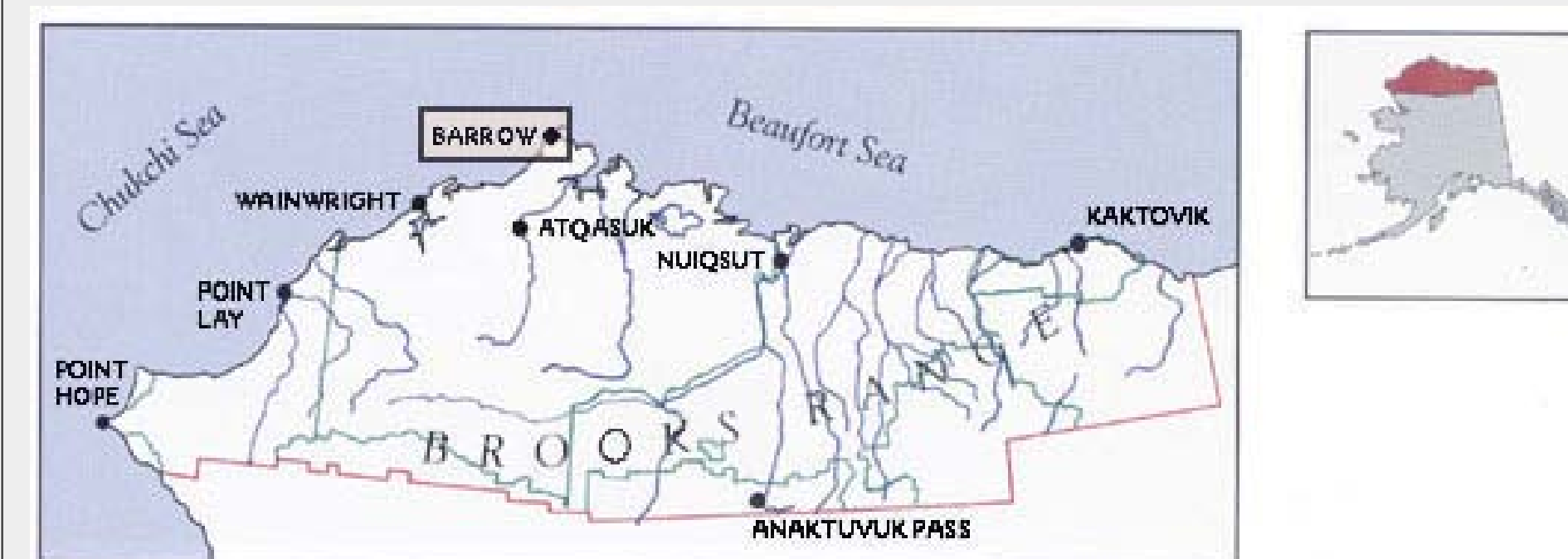
- 1 - increase student interest levels in science?
- 2 - influence student choice of science as a career option?
- 3 - influence student understanding of science content?
- 4 - influence science course offerings at Iḷisaḡvik College and the teaching methods of the action researcher?



Bowhead whale subsistence hunters

Study Population

The study population includes high school students from four different villages on the North Slope of Alaska:
Atqasuk, Barrow, Kaktovik, and Point Lay

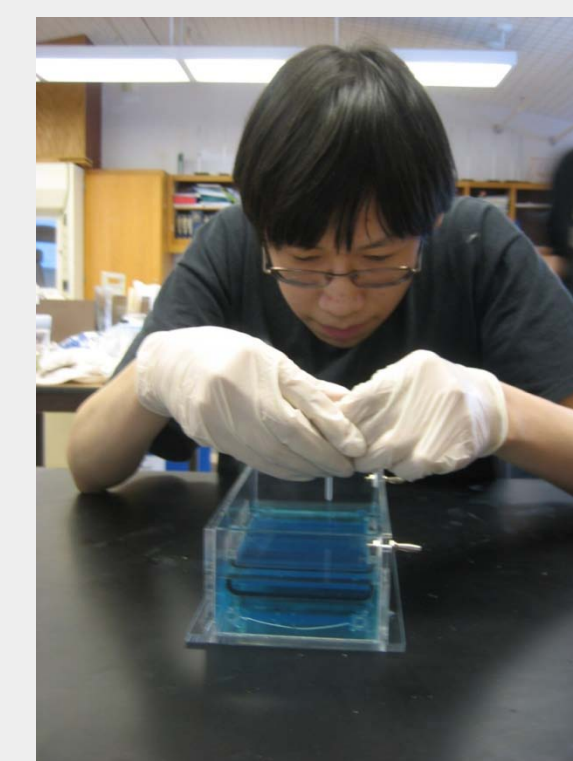


North Slope Borough website, <http://www.north-slope.org/villages/barrow/>

Methodology

Workshop Day One

- Basics of genetics
- Introduction to tools, techniques used in biotechnology:
 - DNA extraction
 - Gel electrophoresis
 - DNA fingerprinting



Student loading gel

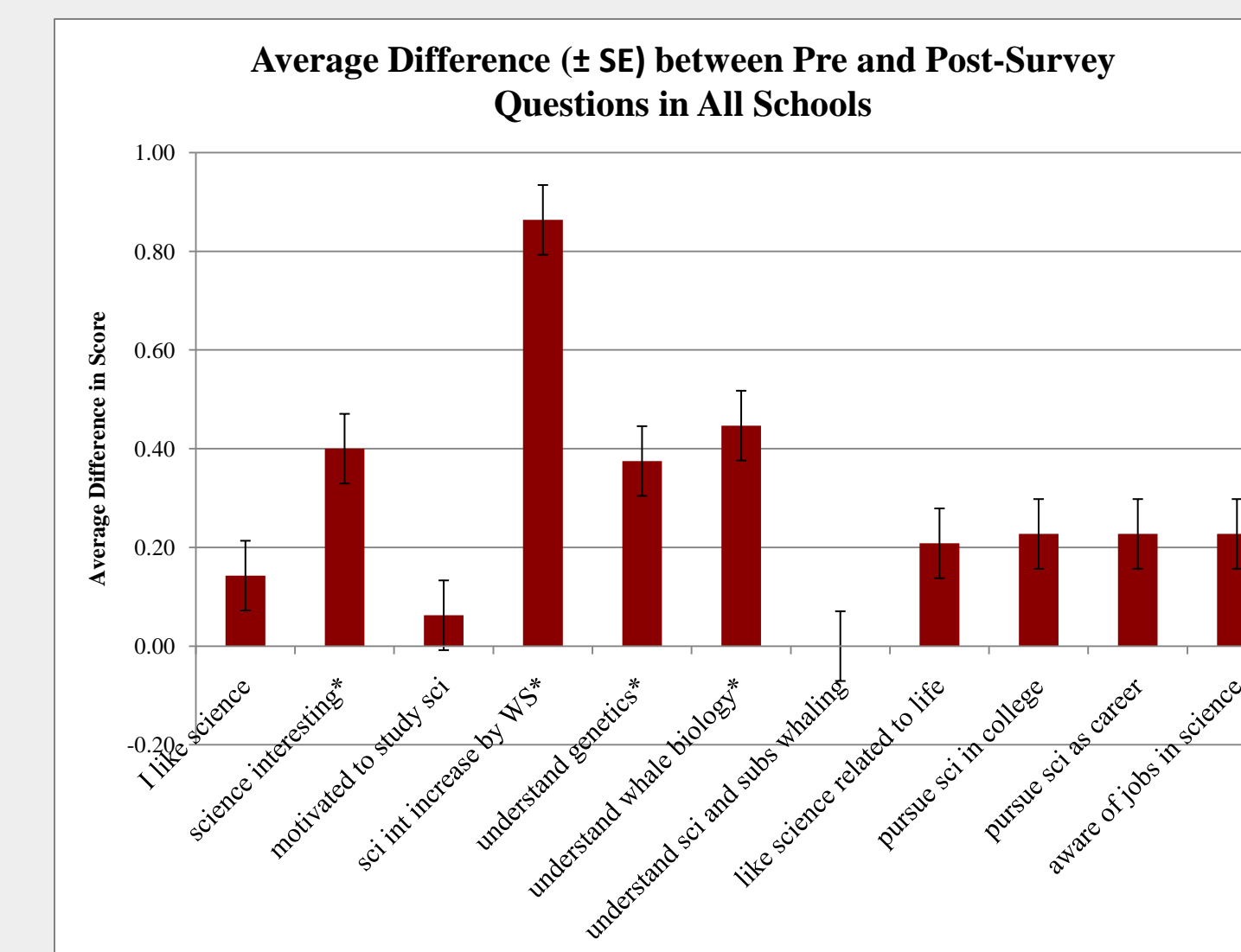
Workshop Day Two

- View DNA "fingerprints"
- Explain their use in research of bowhead and beluga whales and caribou
- Explain importance of genetics studies for subsistence hunting

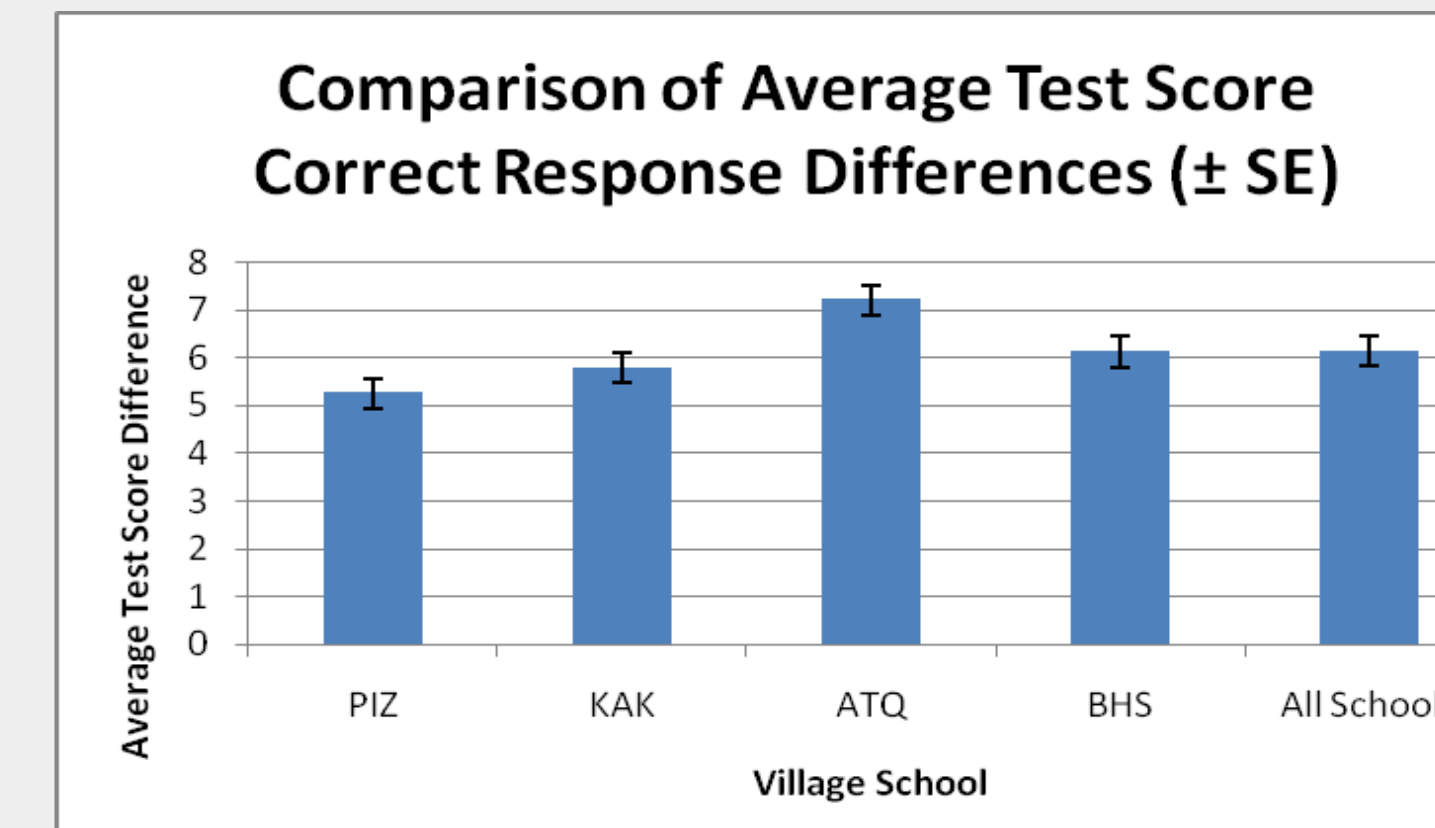
Data Collection Tools

1. Pre- and Post-Student Interest Surveys
2. Pre- and Post-Student Tests on Content
3. Classroom Teacher Surveys
4. Action Researcher Journal

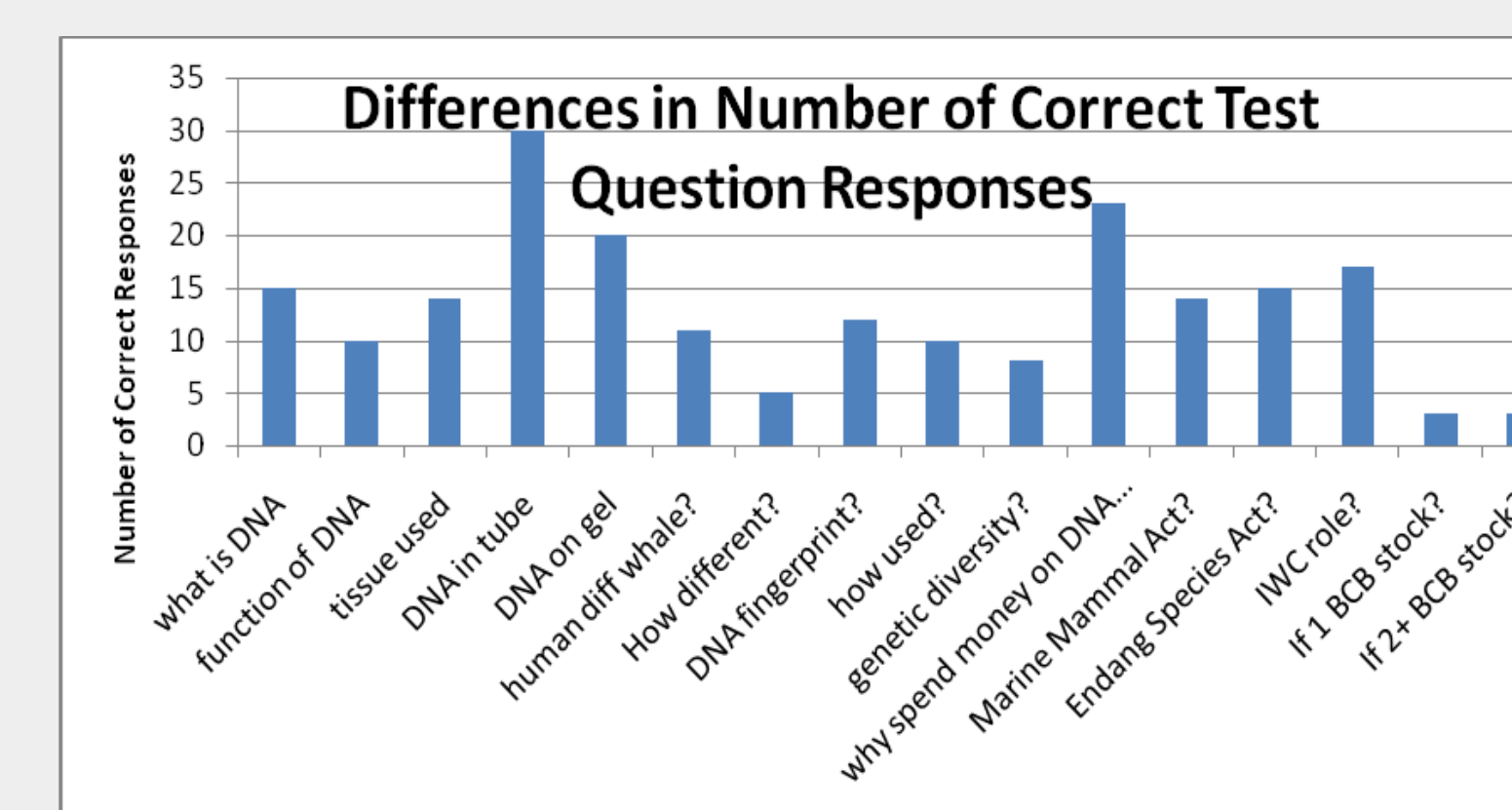
Results and Data Analysis



Average difference between pre- and post-survey questions.
* = significant difference



Comparison of Average Test Score Differences between All Schools. (N=35)



Number of Differences in Correct Responses to Individual Test Questions for All Schools. (N=35)



Student spooling DNA from cheek cells

Conclusions

Workshop had positive effect on:

- Student interest in science at all four schools
- Student choice of science for college/career in few schools
- Student understanding of content at all four schools
- Validation for teaching methods



Student extracting DNA from cheek cells

Implications

- Workshops are effective
 - Hands-on activities important
 - Student populations affected differently
 - Need to be tailored to specific student needs
- Long-term outreach needed to see effect on student college/career choices
 - Include information on careers
- Local, cultural relevance important to the success of the workshop

Acknowledgments

Many thanks to my advisor, Walt Woolbaugh, my project reader, Jewel Reuter, and my support team for providing the guidance for this project. Thanks to the communities and students on the North Slope who allowed me to intrude into their classrooms. Going through this action research process alongside my MSSE cohort group was very helpful and comforting!

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