STEM Teaching in Rural Areas using Cultural Knowledge Systems: Testing a model for community-engaged, place-based resource development

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Overview
In rural Alaska cultural knowledge systems have been in place for millennia. This project leverages those living resources to provide place-based focus and elevate the priority of science education in rural areas. Community members organized into a TRACK Team select the curricular theme, identify related themes, provide content, and review all resources developed. An Inupiaq scholar conducts the project research on the effectiveness of the Cultural Connections Process Model, and analyzing the results achieved when resulting resources are implemented.

Products
Five TRACK Talks

Qanniksuq: It is Snowing curriculum

Cultural Connections Process

Preliminary outcomes and recommendations
- High student interest and engagement in the hands-on lessons.
- Improved student retention of concepts.
- Enthusiasm for the TRACK Talk videos due to local relevance, relatable local experts.
- Rhythmic ‘content--activity’ design helped to make lessons achievable.

Recommendations:
- Teach collaboratively with the local Indigenous language teacher.
- Provide links to YouTube videos, other external resources for easy access to background information on concepts (i.e. molecular motion, heat transfer).

Next Steps
- Revise materials based on pilot test results
- TRACK Team review
- Deliver teacher professional development (for credit)
- Distribute and implement resources districtwide
- Share summative research findings

Adapting to the pandemic
To support pilot-testing we:
- Created a Canvas version of the course that was pre-loaded onto devices for remote, off-line learners.
- Developed instructions for adapting each lesson for social distancing, remote delivery.
- Migrated consent forms and research instruments to electronic platforms.
- Provided 1:1 student supplies to prevent transfer of germs.
- Pre-packaged student supplies for easy distribution by teachers.
- Met with pilot-test teachers twice via Zoom for orientation and overview.