

# Finding Out What Works for NATIVE STUDENTS

Researchers in Alaska are putting Native and practitioners' wisdom to the test to see if culturally based education boosts learning.

By Rhonda Barton

**W**hat's Yup'ik about a Yup'ik teacher? That conundrum launched University of Alaska Fairbanks professor Jerry Lipka on a two-decade research collaboration with Yup'ik Eskimo elders and teachers, trying to find ways to connect the culture of the community to the culture of the schools.

Lipka—an ex-New Yorker whose voice still bears a distinctive East Coast brogue—arrived in Dillingham, Alaska, in 1981 to interview for a teacher education position at University of Alaska Fairbanks. The program's goal was to increase the number of Alaska Native credentialed teachers. As the ranks of indigenous teachers grew, the dearth of culturally based curricula became more and more ap-

parent and eventually led a group of Yup'ik educators to invite Lipka to join them in rectifying the matter.

Lipka remembers one member of the group posing the question of how to get at the heart of what makes a Yup'ik teacher perform differently from her non-Native peers.

"We started making videotapes of teachers in the classroom and watched tape after tape," Lipka recalls. "We started to see patterns and differences in how a Yup'ik teacher interacted and communicated with students, as opposed to 'outside teachers.' From there, we started bringing elders into our work because we knew they had a tremendous amount of knowledge that wasn't reflected in the schools."

At one meeting, an elder named

Lilly Gamechuk asked a teacher to stand up. "She eyeballed Anecia (the teacher)," Lipka says, his voice still tinged with wonder, "and when we gave Lilly paper and scissors, she cut out a hat, booties, and a type of qaspeq" (a traditional outer garment). Amazingly, everything fit.

"That was the very beginning of our work on Yup'ik body measurements, visualization, spatiality, and how these things may connect to math," notes Lipka. After one book and countless studies, the latest offshoot of that inquiry is a series of modules that explore mathematical

concepts in a cultural context.

## LESSONS FROM THE FISH CAMP

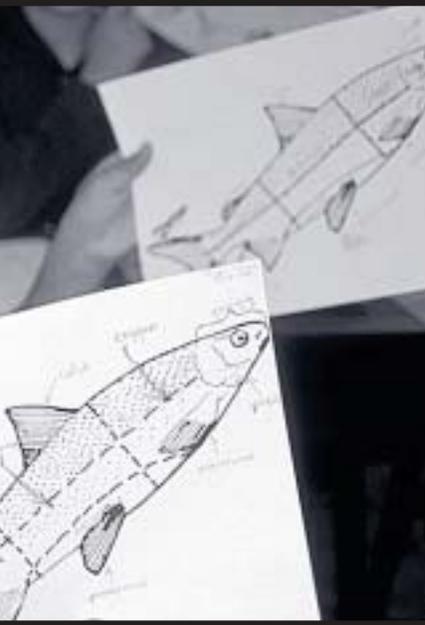
One of the first modules to be published by Lipka and coauthor Barbara Adams links to an age-old tradition: In summer, when salmon make their prodigious journey from the Pacific upstream through Western Alaska's rivers to spawn, Yup'ik families travel to fish camps to lay in a supply of food that will carry them through the lean winter months.

Elders say, "Fish as if you wouldn't catch any animals all winter. Then,



**TOP:** Head Start students perform a Tlingit song at a summit on Native education. (Photo courtesy of First Alaskans Institute)

**BOTTOM:** Jamie Nicholas (left) and Grando Seal study local fish as part of Yup'ik thematic units developed by the Lower Kuskokwim School District. (Photo by Rhonda Barton)



if you do catch something you will do well, but if you don't catch any (other) animals, you will get tired of fish, but you won't starve."

The fish camp not only yields lessons of survival and sustainable yield, but it helps sixth-graders learn properties of geometrical shapes, place values, and mathematical relationships. The curriculum—*Building a Fish Rack: Investigations Into Proof, Properties, Perimeter, and Area*—challenges students to construct a model of the drying rack used to preserve chum, pink, coho, sockeye, and king salmon harvested in fish camps up and down the coast. It's a task that requires youngsters to figure out the geometry of a rectangle and the re-

lationships among perimeter, area, strength, and shape. In the process, the class also learns facts such as the number of eggs a female salmon lays (up to 4,500, depending on the species) and what a family needs to take to fish camp (fuel, food, household supplies, fishing gear, and maybe tents).

As they developed and pilot-tested the module in village schools, Lipka and Adams struggled with a nagging question: Is the curriculum having an impact on student performance? "The elders have poured their heart and soul into this endeavor. We wanted to show them—and ourselves—that it's making a difference," says Lipka. "And if it isn't making a difference, why not?"

## LOOKING FOR THE PROOF

As it turns out, determining whether culturally based education (CBE) improves academic performance among Native American students has yet to be scientifically proven, though some experts intuitively believe it does. While hundreds of CBE studies have been conducted over the years, few adhere to the rigorous research standards called for in the No Child Left Behind Act. In fact, Lipka and Adams's work on the fish rack curriculum is one of just a half-dozen experimental or quasi-experimental examples cited in a recent research literature review by William Demmert and John Towner.

Lipka and Adams tested their module on students in both rural

Using a culturally based math curriculum, students in Akiak, Alaska, learn how to build a structure for drying fish. With string, they lay out the corners of a fish rack. (Photo by Stacy Clark)



24 and urban settings, with teachers randomly assigned to a treatment or control group. Their study involved one urban school district (in Fairbanks) and four rural school districts with a 97 percent Yup'ik enrollment. Using pre- and posttest scores from 258 students in 15 classes, they found a significant difference in test results between all treatment groups and all control groups.

“Our first premise was, you’re starting with Yup’ik subsistence activities, so you’d hope that Yup’ik students would benefit,” says Adams, a Pennsylvania transplant who, like Lipka, found her life’s calling in the far North. “For us, that would mean gains in their math scores. We did see that,” she pauses, “but what was really interesting was we found that in the urban areas, Caucasian students, African Americans, Hispanics, Asians, and even Athabascans—who have a different cultural connection—benefited from the curriculum as well.”

In the end, the urban treatment group gained the most, but the rural treatment group made great strides, significantly narrowing the achievement gap. Rural students who used the cultural curriculum saw their math test scores rise seven points and urban students showed an increase of 17 points, while the rural and urban control groups had no appreciable change in their scores.

The results of three years of data

collection are encouraging, but they don’t provide all the answers. Lipka and Adams are still doing in-depth case studies, examining videotapes of teachers, and trying to winnow out just what leads to success. “As we do the qualitative studies to complement the quantitative, and we have a better understanding of the in-classroom factors that may make a difference, then we’ll have a much better picture of what’s going on,” Lipka believes. “The proof will be in the pudding.”

### AN ETHICAL QUESTION

Lipka and Adams concede that it’s “tricky” to carry out quantitative studies because of the difficulty of getting a control group. That fact is underscored in the literature review by Demmert, a Tlingit professor at Western Washington University, and Towner, a researcher at the Northwest Regional Educational Laboratory. In their 2003 review, Demmert and Towner point to these common problems in CBE research:

**The problem of time.** In order for culturally based education to generate a detectable impact, a certain amount of time is required. The longer the time of the program or intervention, the more likely it is that it will have an effect. But, with increased time there is also an increase in the likelihood of experimental problems such as mortality, history, and maturation acting dif-

ferentially on the comparison groups. Likewise, increased time is probably associated with decreases in treatment fidelity.

**The problem of ethics and group formation.** Deciding to include some students in a potentially valuable educational program and exclude others for the purposes of research presents some ethical issues. One possible remedy is to run an experimental program in relatively short, repeating cycles so that

all students can receive any potential benefit of the program. This alternative, of course, has its own set of problems from both an ethical and a research design perspective. **The problem of measurement.** The problem of measurement is not limited to experimental and quasi-experimental research. Identifying valid and reliable measures of student achievement that are culturally appropriate (as opposed to bias-free, which might not

## CONSIDER THIS

Ask your students to imagine that they and their families were going to purchase all the chicken or beef they needed for one year at one time.

How much would your family need?

How would your family store it all?

How would your family make sure their food wouldn't spoil during the year?

These are just some of the questions students investigate in *Building a Fish Rack: Investigations Into Proof, Properties, Perimeter, and Area*. Part of the Math in a Cultural Context series, the curriculum is available from the University of Alaska Fairbanks at (907) 474-6996 or e-mail [fnfmb@uaf.edu](mailto:fnfmb@uaf.edu). You can also order the culturally based math curriculum, *Going to Egg Island*, which is appropriate for first- and second-graders.

A study of the fish rack unit is highlighted in *A Review of the Research Literature on the Influences of Culturally Based Education on the Academic Performance of Native American Students* by William G. Demmert Jr. and John C. Towner. The review can be found online at [www.nwrel.org/indianed/cbe/](http://www.nwrel.org/indianed/cbe/).

## RESOURCES

### Alaska Native Knowledge Network

[www.ankn.uaf.edu](http://www.ankn.uaf.edu)

This is a resource for compiling and exchanging information related to Alaska Native knowledge systems and ways of knowing. It offers a searchable database of culturally based curricula.

### First Alaskans Institute

[www.firstalaskans.org](http://www.firstalaskans.org)

The Web site maintained by the First Alaskans Institute contains research reports commissioned by the institute, including the *Alaska Native K–12 Education Indicators Report* and the earlier *Survey of Native Perspectives on Alaska Issues*.

### IndianEduResearch.Net

[www.indianeduresearch.net](http://www.indianeduresearch.net)

This Web site provides links to *ERIC Digests* on American Indian and Alaska Native issues, as well as interdisciplinary bibliographies and research papers.

be possible to design) and sensitive enough to detect program impacts has been difficult for researchers. High-stakes measures may not be relevant to the intervention and have the additional problem of costs in terms of administration time and scoring. And, unfortunately, researcher-developed instruments often have low technical adequacy.

John Towner is particularly troubled by the second problem that bubbled to the surface in the literature review. An easygoing man, whose hands still bear the marks of an earlier career installing and repairing commercial pizza ovens, Towner doesn't believe in withholding services—considered valuable by the local communities—in the name of research.

“It is clear from the non-experimental research that CBE is important to the community and there are certainly side benefits to that,” he states. “If the goal is to help kids function biculturally and bilingually, then the research issue becomes what's the best and most efficient way to do that. We might be well served to design different modes of delivery of CBE, partnering schools and communities, rather than deny CBE to someone altogether.”

## CALLING THE SHOTS

For Tsianina Lomawaima and Teresa McCarty, professors at the University of Arizona, the issue is not whether subjects are divided into “haves” versus “have-nots,” but the larger question of who and what is driving the research in the first place. They maintain that research in American Indian and Alaska Native education must be viewed in the context of the rights of tribes to self-government, self-determination, and self-education. Writing in *ERIC Digest*, the two academicians say, “Judging research adequacy within the larger social-historical context of AI/AN education involves answering questions critical to the exercise of sovereignty: Why do the research? What factors motivate the researcher? Who has set the research goals? Who has the ‘disciplinary authority’ to do the research? Who will be involved in conducting the research? Whom does the research serve? How will it benefit the local community?”

More and more tribal governments are stepping up to ask those questions. Some are requiring that tribal representatives participate in setting research standards and evaluating results, or are exercising veto power over study topics. Others, like the First Alaskans Institute, are aggressively setting the research agenda themselves.



A student in Alaska's Lower Kuskokwim School District (Photo by Donald Zanoft)

## 26 BY NATIVES, FOR NATIVES

First Alaskans' policy director, Greta Goto, is back in her Anchorage office after three weeks of flying around the state, sharing the findings of a study on Alaska Native education underwritten by her organization.

*The Alaska Native K–12 Education Indicators* report, compiled by the McDowell Group, provides a quantitative baseline for examining the status of the state's 31,873 Native students and the schools they attend. Using data from the Alaska Department of Education and Early Instruction and the 2000 federal census, it offers a one-stop look at everything from dropout and attendance rates to performance on high school qualifying exams, federal adequate yearly progress reports, benchmark exams, and student/teacher ratios.

The report grew out of two previous studies by First Alaskans that painted a picture of Alaska Native education through focus groups, a random telephone survey, a literature review, and interviews with educational and cultural experts. Those studies yielded two conclusions: Alaska Natives place a high value on education and they are concerned that the system is not meeting their students' needs.

"One thing that came out of those surveys was that we got a better understanding of what people

think about education and their perceptions of what is going on in education. We also learned that people wanted to know more about what the data are telling us about Alaska Native performance in education," says Goto, a member of the Curyung tribe who spent part of her professional life as a trade specialist in Tokyo.

Goto and Sarah Scanlan, First Alaskans' education director, felt they needed their own analysis of existing educational data. They also believed that the information would be most useful if it were disaggregated by the 13 regional Native corporations that were established as a result of the Alaska Native Claims Settlement Act of 1971.

"It had never been done before—by Alaska Natives, for Alaska Natives—in terms of taking a look at the data from our perspective rather than someone else's," points out Scanlan, whose heritage is Inupiat. Goto adds that it's also rare—and critically important—that research results be brought back to Native people for their review and feedback.

The data weren't surprising, so much as "eye-opening," says Goto. The numbers confirm—in black and white—what Alaska Natives have suspected. A significantly lower percentage of indigenous students are proficient in the three subjects (reading, writing, and math) measured by the state benchmark

exams, and Native dropout rates are almost twice those of non-Native students. The statistics also reveal that while almost one-quarter of Alaska's students are Native, less than 5 percent of teachers, 6 percent of superintendents, and 4 percent of principals are.

Whether improving those numbers will mean greater student achievement is one question that First Alaskans intends to probe as it works for more programs to train and retain Native educators. Also high on the research agenda are a more accurate count of dropouts and an investigation of why so many Native children fail to complete their schooling.

How cultural curriculum fits into the puzzle is a topic that sparks debate even among Native people of Alaska. According to Scanlan, some members of the Native community feel that time is better spent learning Western skills, while others stress the importance of reaffirming traditional ways. The First Alaskans' study pointed out that school districts do not report their use of such curriculum to the state, and no one keeps tabs on how it may affect students. But for Scanlan, there's little doubt about the advantages.

"Scientific or not, there is value to Native traditional knowledge," she asserts. "We haven't survived up here by pure luck. It's been local people knowing weather patterns and ex-

amining needs to make sure their hunting and fishing practices perpetuated animals and fish so they'd be around for generations to come. There has to be a value placed on that . . . and for some reason we haven't been able to communicate that. For us, that's our science."

Back in Fairbanks, Lipka, Adams, and their Native colleagues are working to honor traditional cultural knowledge and bridge it with schooling. By combining qualitative and quantitative studies, they hope to shed light on what factors make a difference in helping students meet both Native and Western education goals. ■