Distance Education and Equal Opportunities: Learning Math in Rural Alaska

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Interior~Aleutians Campus,
College of Rural & Community Development,
University of Alaska Fairbanks
About Alaska

- A Third the size of the Lower 48
- 3 Urban Areas
  - Fairbanks
  - Juneau (state capitol)
  - Anchorage (half the state’s population is here)
- 200 villages between 25–5000
  - Most accessible only by air, water, and over land
  - Subsistence Lifestyle (rural residents harvest an average of 375 pounds of wild food per year)
Mission Statement: The College of Rural & Community Development provides academic and vocational education that promotes workforce preparation, economic development, life-long learning, and community development with an emphasis on Alaska Natives, and underserved communities.
Interior~Aleutians Campus

serves 52 rural villages
views of the village of Nulato
Developmental & 100 Level Mathematics Courses are required to earn Certificates, Associates, & Bachelor Degrees.
Majors Available for Certificates

• Accounting Technician
• Applied Business Management
• Community Health
• Construction Trades Technology
• Early Childhood Education
• Educator: Para-Professional
• High Latitude Range Management
• Information Technology Specialist
• Rural Human Services
• Tribal Management
• Veterinary Science

Majors Available for AAS Degrees

• Applied Accounting
• Apprenticeship Technology
• Applied Business
• Community Health
• Construction Trades Technology
• Early Childhood Education
• Educator: Para-Professional
• Human Services
• Information Technology Specialist
• Medical Assistant
• Renewable Resources
• Tribal Management
Since mathematics is a requirement for all students seeking certificates or degrees, how are they doing?

∞ What kinds of teaching methods have faculty developed to reach rural students?

∞ What is it like to be a student taking college math classes from rural Alaska?

∞ Why do so many rural students need remedial courses in mathematics before they can satisfy their academic requirements? Why so many?
Who are our students?

Data collected from Fall 2004 – Fall 2008
Students who took a Developmental Math &/or 100 Level Math Class

- Alaska Native: 72.7%
- Other Minorities: 4.8%
- White: 19.5%
- Unknown: 3.0%
Gender of CRCD Students registered for Developmental Math &/or 100 Level Math Fall 2004 – Fall 2008

75.50% Females
24.50% Males
Age of CRCD Students
registered for Developmental Math
&/or 100 Level Math between
Fall 2004 – Fall 2008

- Less than 20 years old: 17.5%
- Greater than 20, less than 30 years old: 36.9%
- Greater than 30, less than 40 years old: 20.1%
- Greater than 40, less than 50 years old: 12.9%
- Greater than 50, less than 60 years old: 11.8%
- Greater than 60: 0.8%
Background: History of Education in Rural Alaska

Archeological Evidence shows that Alaska Natives have lived in Alaska for over 10,000 years!

Knowledge about how to live and survive in the extreme isolation & weather of Alaska has been transmitted for generations!

Formal education, as we know it today began when outsiders encountered the Natives, and imposed their beliefs.
Paul Island School in the Late 1800s
The assumption that people's needs are best served through schools that promote "civilization" and Christianity is a powerful theme that impacted Alaskan Education.
Nulato (early 1900s): Note geometric designs on parkas.
System of Education in Alaska:

School pupils in Stevens Village

(2 + 2 = 4 on chalkboard)

Archives, University of Alaska, Fairbanks
Boarding Schools

Providing Equal Opportunities for Education?

Chilkoot Mission School 1895
8th Grade Graduation in Point Hope

No high schools for majority of those completing 8th grade!

Also, many students were older because of family responsibilities along the way!
1976 Molly Hooch case dramatically influenced the number of graduates
Alaska Education Today

Alaska Native Knowledge Network  [www.ankn.uaf.edu](http://www.ankn.uaf.edu)

Nearly all Alaska students attend elementary & secondary schools in villages, rural centers, or urban schools.

However, falling behind in NCLB testing.
History of Education in Nulato

- 1975 public school constructed for 100+ local school age children
- New school an asset to community
- Offered extra-curricular activities (spelling bee, basketball, skiing, academic leadership programs)
- Community focus on performing well in school!
Yukon-Koyukuk School District

- Originally controlled 11 schools
- Now nine schools (if school doesn’t serve 10 students, it closes for fiscal reasons!
- Leonard Stickman, Sr. was part of original school board
- 25 years later, following in his footsteps
Learning Math in Rural Alaska

Â Working on Associate Degree first, then toward Bachelor of Arts in Education to be a teacher!

Â Via audio conference, internet, and face to face intensive have studied Prealgebra, Elementary Algebra & Intermediate Algebra!

Â Challenges include internet access, weather, balancing family & community responsibilities with being a student!
Developmental Math Sequence

ÅDEVM 050 Prealgebra
ÅDEVM 060 Elementary Algebra
ÅDEVM 105 Intermediate Algebra
ÅMATH 107 Precalculus or
ÅMATH 161 Algebra for Business & Economics
## Fall 2004 to Spring 2008

<table>
<thead>
<tr>
<th>Course</th>
<th># of students registered</th>
<th>Pass Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prealgebra</td>
<td>31</td>
<td>77.40%</td>
</tr>
<tr>
<td>Elementary Algebra</td>
<td>119</td>
<td>54.60%</td>
</tr>
<tr>
<td>Intermediate Algebra</td>
<td>179</td>
<td>50.30%</td>
</tr>
<tr>
<td>Advanced Intermediate Algebra</td>
<td>27</td>
<td>55.60%</td>
</tr>
</tbody>
</table>
How well do Developmental Courses Prepare students for the next class?

<table>
<thead>
<tr>
<th>Of Successful Students</th>
<th>Did NOT Attempt Target Course</th>
<th>Attempted Target Course</th>
<th>Passed Target Course the First Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prealgebra</td>
<td>8</td>
<td>16</td>
<td>62.50%</td>
</tr>
<tr>
<td>Elementary Algebra</td>
<td>30</td>
<td>35</td>
<td>57.10%</td>
</tr>
<tr>
<td>Intermediate Algebra</td>
<td>30</td>
<td>59</td>
<td>64.40%</td>
</tr>
<tr>
<td>Advanced Intermediate Algebra</td>
<td>4</td>
<td>11</td>
<td>54.50%</td>
</tr>
</tbody>
</table>
What happens to those that do not complete a class successfully?

<table>
<thead>
<tr>
<th>Of Students NOT Successful in their math class</th>
<th>Those that &quot;gave up&quot; took no more math classes</th>
<th>Those that tried same class again once &amp; not successful, then &quot;gave up&quot;</th>
<th>Those that tried same class again once &amp; passed!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prealgebra</td>
<td>57.10%</td>
<td>14.30%</td>
<td>28.50%</td>
</tr>
<tr>
<td>Elementary Algebra</td>
<td>68.50%</td>
<td>3.70%</td>
<td>3.70%</td>
</tr>
<tr>
<td>Intermediate Algebra</td>
<td>65.20%</td>
<td>11.20%</td>
<td>6.70%</td>
</tr>
<tr>
<td>Advanced Intermediate Algebra</td>
<td>50%</td>
<td>16.70%</td>
<td>0.00%</td>
</tr>
</tbody>
</table>
Methods of Reaching Rural Students

- Audio Conference Call is still the most reliable form of communication with rural Alaska
- Blackboard (virtual classroom)
- Elluminate Live (Web-based interface)
- Faxing
What is Reach to Teach?

- Alaska Native Education grant from Department of Education in Washington D.C.
- Offer academic & financial support to students wanting a degree in education for their required math & English courses
- Create a community of future educators
How can Reach to Teach Help?

• We want to see future educators receive grades of “B” or better in their required math & English courses.

• In the past, math & developmental math courses have acted as “gatekeeper” courses, keeping potential new teachers from achieving academic success, and thus keeping them from becoming certified teachers.
Talking with Elders
Developmental Math Intensives
# Reach to Teach Intensives

<table>
<thead>
<tr>
<th>When?</th>
<th>Type of Intensive</th>
<th>Number of Participants</th>
<th>Successful Semester (&quot;C&quot; or better)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall 2007</td>
<td>Math 205 Intensive</td>
<td>10 students</td>
<td>100%</td>
</tr>
<tr>
<td>Fall 2007</td>
<td>Dev Math Intensive</td>
<td>8 students</td>
<td>75%</td>
</tr>
<tr>
<td>Spring 08</td>
<td>Math 206 Intensive</td>
<td>11 students</td>
<td>91%</td>
</tr>
<tr>
<td>Spring 08</td>
<td>Dev Math Intensive</td>
<td>10 students</td>
<td>70%</td>
</tr>
<tr>
<td>Summer 08</td>
<td>DEVM 105</td>
<td>5 students</td>
<td>80%</td>
</tr>
<tr>
<td>Summer 08</td>
<td>MATH 107</td>
<td>3 students</td>
<td>100%</td>
</tr>
</tbody>
</table>
Summer MATH Course Pilot
(2 weeks Audio, 3 Weeks Face-to-Face, 1 Week Audio)
Celebrating Our Graduates!
Common Problems

• Poor internet connection in many villages
• Some villages have great internet
• Phone lines not working
• Echoes on the phone lines
• Faxes don't go through!
Differentiating Instruction

- Using On-Line Homework like MyMathLab & WebAssign is great for students that have the internet.
- Frustrating for those that don’t, or are intimidated by computers.
- Parallel assignments from the textbook made available to students.
- Faxing Quizzes & Exams to evaluate hand written work, and to provide feedback to the students.
- Flexible Due Dates, because of technology problems!
Student Support

- Caring Faculty
- Hours of extra time "walking" students through computer set-ups
- Building student self-confidence
- Speaking to students individually
Create Trust in Education

To the extent that minority students believe that they might be excluded or rejected on the basis of race, they may thus view school as irrelevant to their self-interests and identity.

WISE Strategies are those that assure stigmatized students that they will not be judged or treated stereotypically that their abilities and belonging are assumed rather than doubted.

Educators need to convey a faith in the student's potential!

Set High Standards, and explicitly reassure students that they have the capacity to meet those standards through greater effort!
Current Research Question:
How to create more Active Learning during classtime?

- When you ask a question via audio, you can’t see their faces. Dead Air.
- Cultural preferences are not to “brag” or be the one that got the right answer, and not to be the one who sounds like they don’t understand in front of others.
- How to facilitate cooperative learning activities where the students feel safe enough to try!
- Anonymous responses via internet!
**References**


Photo References