

SBCTC Online Grant Management System

Printed By: Bill Moore, State Board for Community and Technical Colleges

Print Date: 2/17/2010 5:37 PM

2010 Gates: Pre-College Math NWIC_APP6251
Status: Submitted

Applicant Information

Institution: Northwest Indian College

Consortium: No

Contact:

Name: Justin Guillory

Title: Dean of Academics and Extended Campuses

Address: 2522 Kwina Road
Bellingham, WA 98226-9278

Phone: 360-392-4338

Fax: 360-738-0136

Email: jguillory@nwic.edu

Contents

Section 1

Team Lead's Department

Justin Guillory, Dean of Academics and Distance Learning

Core Team and Partners

1A. List other faculty/staff (including titles, departments, and email addresses) at the college who will be directly involved in leading and/or implementing the project.

Matteo Tamburini (Faculty, Mathematics Department, mtamburini@nwic.edu)

John Frey (Faculty, Learning Assistance Center, jfrey@nwic.edu)

Gaylene Gobert (Site Manager and Faculty, Swinomish Extended Campus, ggobert@nwic.edu)

Kathy Humphreys-Shafer (Faculty, ABE-GED, khumphreys@nwic.edu)

Nathan Hall (Part-time Faculty, Mathematics Department, nhall@nwic.edu)

James Giles (Part-time Faculty, Mathematics, Port Gamble S' Klallam Extended Campus, jjgiles@comcast.net)

Greg Pesho (Coordinator, Math and Writing Center, gpesho@nwic.edu)

Josie Kamkoff (Tutor, Math and Writing Center, jkamkoff@nwic.edu)

Zach Bunton (Tutor, Math and Writing Center, zbunton@nwic.edu)

1B. Indicate which, if any, other departments or offices at the college or other schools or institutions that will play supportive roles in implementing the proposal. (optional)

Staff of the College's Math and English Tutoring Center will actively participate in all activities.

The main College campus is at Lummi near Bellingham. Staffed, full service extended campuses are located at the Swinomish, Port Gamble S' Klallam, Tulalip, Muckleshoot, and Nez Perce reservations. Courses are also offered through distance learning modalities.

Approximately 27% of our 1,254 students during the 2008-09 academic year were served at the Lummi campus. All others were served at either the extended campuses or through distance learning modalities.

Because they have been teaching pre-college math for the College for many years, staff and part-time math faculty from our Swinomish extended campus and our Port Gamble S'Klallam extended campus will participate in the project.

Our strong relationship with the Western Washington University Math Department will result in their faculty providing professional development opportunities for our faculty and tutors.

Section 2

Existing Resources/Capacity

2A. Describe the current program structure/format of your pre-college to college-level math offerings including number of full- and part-time faculty who teach courses in the program.

(max. characters: 2,000)

All new students pursuing a program of study at Northwest Indian College are required to complete an approved placement test. Test results help students and their advisors select courses appropriate to the student's academic ability. Approximately 98% of our incoming students test at the pre-college math level.

Pre-college math courses are:

- 1) Math 070: Basic Mathematics (5 cr) – reviews basic arithmetic through organized workbook activities
- 2) Math 098: Elementary Algebra (5 cr) – reviews arithmetic, order of operations, exponents, absolute values, linear equations and inequalities, monomials, polynomials, factoring polynomials, combining polynomials, and fractions of algebra
- 3) Math 099: Intermediate Algebra (5 cr) – covers operations with polynomials, factoring trinomials, solving linear and quadratic equations, graphing and the rectangular coordinate system, function notation, inequalities, systems of linear equations, rational expressions, radicals and complex numbers, completing the square and the quadratic formula

Math 70 and Math 98 have built-in labs that are offered between and after classes. They are staffed by course instructors and a work study student who successfully completed Math 98.

The College Math and Writing Center, located at the College's Lummi campus, provides academic tutoring in all subjects, with an emphasis on math and writing. Peer and professional tutors provide individual and small group tutoring. Tutoring is also available for off-campus students.

The College has:

- 1) One full-time math faculty
- 2) One full-time Learning Assistance Center faculty who teaches pre-college math

- 3) Two regular part-time math faculty, one at our Lummi campus and one at our Port Gamble S'Klallam campus
- 4) One Site Manager at our Swinomish Extended Campus who teaches pre-college math
- 5) One ABE-GED instructor who teaches pre-college math
- 6) The Coordinator and two tutors at our Math and Writing Center who provide math tutoring

2B. Summarize any local research findings you've reviewed on student success in the pre-college math sequence (from Adult Basic Education through developmental education) and in college-level math courses.

(max. characters: 2,000)

Informal internal research strongly suggests that our students are more successful in a classroom learning environment than in a self-paced learning environment. Data suggests that our students are more successful if they have access to math tutoring.

The home environments of our students are often not conducive to homework or studying. Our average student is over 30 years old and has three or more children. These students can have significant family or work obligations and may not have a home computer or access to the internet. Some live in dysfunctional households. Having a location on campus where students can study and receive the support they need enhances success.

Over 80% of our students are American Indians / Alaskan Natives. Research shows that cultural congruency between a school's curricula and a student's cultural community is a key element of student success. Whenever Native students' cultural affiliations are valued in the classroom, motivation for learning increases (Kanu 2006). Incorporating Native language, history, and culture into curricula improves educational outcomes for Native students (Lipka & Adams, 2002; Strand & Peacock, 2002; Research Agenda Working Group, 2001).

An effective method to increase and enhance math and science education in tribal colleges is to "contextualize" science by making it relevant to regional issues (Berardi et al., 2002). Involving students in activities relevant to their own community and engaging acknowledged community experts in developing integrated curricula or sharing cultural knowledge and skills with students makes it possible to create deep connections between the concrete realities of local life and the abstract ideas posed by academic math and science (Weeks, 2003). Drawing on the knowledge held within a local community and addressing local concerns can also earn family and community support for science and math education (Demmert, 2001).

2C. Describe any current or recent projects, grants, campus initiatives, etc. that serve as a foundation for the work being proposed; what existing work are you building on in this proposal and how is it connected?

(max. characters: 2,000)

In 2002, the College began an ongoing effort to create an integrated campus culture focused on student learning, retention, and graduation. Our faculty and staff are working to ensure that the entire College embraces the new organizational norm of continuous improvement in student learning.

Phase I of our assessment program (2002-2007) involved collecting and analyzing baseline data and initiating new processes related to, among other things, the development of new course and college outcomes. An important component of this is the First Year Experience, a program that optimizes student learning in a tribal college context and helps ensure that all incoming students acquire the academic skills needed to succeed.

Phase II (2007-2012) focuses on: 1) using the information to improve student learning; 2) emphasizing cultural values / knowledge; 3) developing cultural outcomes and meaningful assessment strategies; 4) increasing student, faculty, staff, and administrator participation; 5) educating students about the College's mission and the role of assessment in their education; 6) creating a cycle of surveys and reports; 7) developing a program outcomes process; and 8) reporting results to stakeholders.

As part of this process, our pre-college math faculty and staff reviewed our program outcomes. This resulted in the identification of a need to review the learning outcomes for all pre-college math courses more thoroughly. Ultimately, this will require an assessment of all facets of the pre-college math program, including grading processes, rubrics, definitions of proficiency, and more.

Concurrently with this grant request, the College is applying for a service learning grant that will focus on science, technology, engineering, and math topics. One aspect of that project that will dovetail nicely with this project will be that the science and math programs will work together to integrate real world applications of math and science into students' educational experience.

2D. What professional development opportunities currently exist for pre-college math faculty (part-time as well as full-time)?

(max. characters: 1,000)

Few professional development opportunities specifically for pre-college math faculty exist. On a weekly basis, there is an informal gathering of full-time and part-time math faculty to review and discuss such elements of the program as tests, exams, class attendance, specific student challenges, course assessments, and more. Also, faculty have submitted course examinations for review to a mathematics professor at Duke University. The feedback provides excellent learning opportunities for faculty and staff.

Professional development opportunities for all College faculty and staff occur regularly. Recent formal workshop topics include: 1) Learning Styles and Preferences of Native American Students; 2) Culture as the Heart of Education; 3) Best Practices in On-line Teaching; 4) Service Learning in the Classroom; 5) Action Research; 6) Indigenous Evaluation; and 7) The Value of Case Studies.

For those unable to attend the workshops, videos are available on-line.

2E. Based on the evidence you have, what are the current strengths of the pre-college math program and what are the major issues/challenges that need to be addressed?

(max. characters: 2,000)

Program strengths include:

- 1) Small class sizes / a teacher-to-student ratio of better than 1:20
- 2) Extensive office hours for faculty, with at least 10 hours per week set aside to provide one-on-one student support
- 3) Built-in labs for pre-college math courses ensure that students have time to do homework and receive one-on-one support from tutors as well as the faculty person teaching the course
- 4) A tutoring center supports students when faculty are unavailable
- 5) Students are provided with incentives to take advantage of tutoring (e.g., class attendance is a part of each student's grade and using the tutoring center counts towards attendance)

Issues and challenges that must be addressed include:

- 1) Teaching methods used by faculty and tutors do not always mesh – more opportunities for communication are needed
- 2) New math faculty, especially at extended campuses, often do not benefit from mentoring and may not teach to the same course outcomes as permanent faculty – more opportunities for

communication, to include written protocols, are needed

3) There is little communication between math faculty at the main campus and the extended campuses – more opportunities for communication are needed

4) Existing placement testing is useful, but not perfect – additional student placement assessment tools are needed

5) Students fail to see a real-world connection to what they are learning, resulting in a lack of motivation – new pedagogies are needed

6) A high percentage of students are not college ready or academically prepared – new pedagogies are needed

7) Our average student is older, has dependent children, works 30+ hours per week, and is low income; as a result, they may, for example, have transportation problems or must bring children to class – a consistent set of protocols must be developed to help new and existing faculty address these and comparable issues

Section 3

Goals/Strategies/Activities

3A. The overall long-term goal of the project is to increase student achievement in college-level math courses by improving student success in and progress through their pre-college math (ABE and Dev Ed) experience in Washington community and technical colleges. To achieve this goal participating colleges are asked to address core areas of educational practice: what math is taught (restructuring/redefining the curriculum), how it is taught (emphasizing student understanding and engagement), and how it is assessed (refining diagnostic and classroom-based assessments). Given these parameters and the description of your program's strengths and challenges in section 2, describe what you'd like to accomplish if your institution were selected to participate in this project.

(max. characters: 4,000)

The College will form a Faculty Inquiry Group (FIG) to include: 1) full- and part-time faculty who teach pre-college math at the main campus; 2) pre-college math faculty who have been consistently employed for long periods at extended campuses; and 3) math tutors from the main campus.

The FIG will meet once or twice a week throughout the academic year plus for a one-week intensive period during summer quarters. Meetings will take place via interactive television (ITV), allowing extended campus personnel to participate with no travel expenses.

During spring 2010, FIG members will assess the testing devices and course outcomes for Math 98, the pre-college math course with the most students. This diagnostic activity will identify the elements that generate the greatest success among students. We will analyze the relationship of course learning outcomes to student assessment devices to ensure that the latter accurately addresses the former.

In summer 2010, FIG members will meet for one week to discuss and analyze various approaches to enhance classroom instruction related to the new outcomes. The group will: 1) identify activities that enhance the curriculum; 2) evaluate instructional approaches that teach to the new outcomes; 3) develop a deeper understanding of the new outcomes and assessment devices; and 4) identify instructional approaches to pilot during fall quarter.

In fall 2010, we will restructure the Math 98 curriculum. Rubrics reflecting course outcomes will be developed and the course will be streamlined so it is both a natural outgrowth of Math 70 and a natural step into Math 99. Rather than completely restructuring the course, we will build on its strong elements to make it even stronger.

During the remainder of the grant period, we will engage in a similar process with Math 70 and Math 98. We will also explore the possibility of reintroducing Math 85 (pre-Algebra) into the course catalog. And we will create a rubric for the entire pre-college math series that will allow us to assess the degree to which students are moving through the spectrum and are prepared to succeed at college-level math.

Other FIG activities will include:

- 1) Math faculty from other tribal colleges will provide guidance on effective culturally relevant teaching practices.
- 2) Math Education faculty from Western Washington University's Mathematics Department will inform FIG members of the latest research on effective pre-college math instruction practices.
- 3) More hands-on learning opportunities, real-world applications, and potential service learning opportunities will be built into the curricula. Our science faculty will inform math faculty of the community-based topics they are addressing in their courses so those same themes can be addressed in math courses. Students will use mathematics to analyze, understand, and address real-world issues. The emphasis will be on both the applied and utilitarian nature of math in science. The content will emphasize numeracy, analytical skills, and critical thinking within a problem solving framework.
- 4) Our science faculty will meet with FIG members to inform them of specific problems that students struggle with, allowing the math faculty to focus on those problems.
- 5) We will develop a packet for part-time faculty at all campuses to include course outcomes, syllabi, tests, etc.
- 5) Improved placement of incoming students will result through the creation of an intake interview to be administered at the same time as the placement test.
- 6) By including tutors in the FIG, we will ensure that tutoring supports classroom activities and pedagogies.

The project will ultimately allow us to: 1) increase student persistence through the pre-college math sequence; 2) standardize the pre-college math instructional process and student assessment process; 3) increase student interest and success in college-level math; 4) make students aware of the real-world applications of math.

3B. Do you intend to address a particular aspect of your pre-college math program (e.g., a specific course or transition) rather than take a more global approach to the overall program?

- Yes
 No

If you answered "yes" to 3B, please describe why you chose that aspect.

(max. characters: 1,000)

3C. At this point what is your best thinking about pursuing what is described in 3A., i.e., what strategies or approaches seem most promising to you and why?

(max. characters: 2,000)

The process used by the FIG will be cyclical. It will begin with a question about student learning and assessment and move through at least these stages.

- 1) We will develop a question or questions, with a conscious effort to ensure that the questions are not too broad and ambitious. It is important that we maintain realistic expectations and that our inquiry process have achievable goals and objectives. Questions must be evidence-based and must build on work we are already doing.
- 2) We will develop a plan to address the question. The plan will be student-based. That is, the foundation of the plan will grow out of the most important outcomes for student learning.
- 3) We will gather and evaluate evidence. This will be through both a review of the literature and through professional development opportunities for faculty and tutors.
- 4) In addition to the FIG, relevant NWIC administrators will review the findings, which will then be disseminated both internally and externally. This, in turn, will result in useful feedback that will help identify additional questions to pursue.

The inquiry process will be ongoing, informed by evidence of student learning, and undertaken in a collaborative setting. Findings from the process will come back in the form of new curricula, new assessments, and new pedagogies, which in turn will become subjects for further inquiry.

3D. A critical component of this overall project is faculty leadership and program/department-wide ownership of the proposed efforts to improve pre-college math. How do you plan to involve a "critical mass" of faculty in the efforts you propose (full-time

and part-time) and build a collective program commitment to collegial learning about effective educational practice in pre-college mathematics?

(max. characters: 2,000)

A “critical mass” of pre-college math faculty is already involved in this effort. In fact, they have instigated, designed, and led this process. This fully ensures that there will be a collective program commitment to the project and the necessary energy and enthusiasm to ensure long-term success.

It is worth noting that part-time faculty from all extended campuses have asked for precisely the types of products (syllabi, scope and sequence of subjects to be covered, focus of the courses, etc.). Clearly, both full-time and part-time pre-college math faculty have a strong interest in ensuring that this project succeeds.

When our faculty lead an inquiry of this type in the company of their colleagues, tutors, and students, they will create a “teaching commons” – a set of interconnected forums where conversations about learning take place, where innovations in curricula and pedagogy get tested, and where questions and answers about education are exchanged, critiqued, and built upon.

With grant funds, we will be able to employ temporary part-time faculty to teach courses, providing regular full-time and part-time faculty with sufficient release time to undertake FIG activities. Grant funds will also be used to support the participation of tutors (who are hourly wage earners) and part-time faculty.

By holding FIG meetings on an ITV network, we will make it easy for pre-college math faculty at extended campuses to participate fully.

3E. What professional development, support and/or technical assistance would help you achieve your goals?

(max. characters: 2,000)

As noted above, professional development opportunities for faculty and tutors will play a major role in project implementation and success. Members of the Faculty Inquiry Group (FIG) will benefit from the close relationship our faculty has with instructors at Western Washington University’s Math Education department. Math Education faculty with special expertise in the field of pre-college math instruction will be able to provide our faculty and tutors with the most up-to-date research related to effective pedagogies and other issues relevant to the field.

We will bring in faculty, tutors, and administrators from other tribal colleges to provide

guidance on effective pedagogies and other techniques who teach math or other relevant subjects.

We will seek out Native teachers who teach math to learn about effective approaches to succeeding with Native students.

Members of our FIG will travel to nearby colleges that offer pre-college math courses. FIG members from the main campus at Lummi will visit Whatcom Community College and Bellingham Technical College (BTC) to observe their pre-college math programs. Interactions with pre-college math faculty from BTC are expected to be especially valuable. The textbook used by them and us includes an on-line component that they use extensively and that we have not yet begun to use. BTC faculty will be able to support us as we learn to take advantage of this feature.

Our Swinomish faculty will observe and learn from pre-college math programs at Skagit Valley Community College. Our Port Gamble S'Klallam faculty will observe and learn from partners in the Olympic Peninsula Transition Math Project that is offered through Olympic College and others.

In addition to professional development about classroom issues, we also will learn how others address student placement testing. For example, do their faculty find it accurate and how do they deal with students who have been misplaced?

Section 4

Evaluation Plan

4A. What evidence will you use to help assess the success of the work you propose and how do you intend to gather and use that evidence?

(max. characters: 2,000)

Evidence used to assess the success of our work will fall into two general categories. One will be oriented toward changes in student learning and student interest in math. The other will assess the degree to which the Faculty Inquiry Group achieved its objectives.

Student Oriented Assessment:

We will compare the course completion rates, quarter-to-quarter retention rates, fall-to-fall retention rates, test scores, and success at achieving learning outcomes of grant period students to students from previous years.

FIG members will work with other College personnel to develop a protocol for following up with students who drop out of pre-college math courses to learn why they chose not to continue.

We will survey students at the end of each course so they can assess the instructor and course. While this evaluation process is already in place, it will be altered to address issues relevant to this project, including identification of the learning strategies of the students. Students will complete the survey during class time, but will remain anonymous.

We will work with the Student Records Office to create and maintain a database to track students as they move through the pre-college math course sequence.

To both assess student learning and to identify the next best step for each student, we will re-administer the student placement test two weeks prior to the end of each course in the pre-college math series.

Faculty Inquiry Group (FIG) Assessment:

The College's Director of Institutional Research will survey each member of the FIG at the beginning of the project period, at the beginning of each fall quarter, and at the end of the grant period to gain feedback on the process. This will provide both formative and summative data.

The Director of Institutional Research will assist in the design of an evaluation process that provides formative and summative findings based on the degree to which each of the activities and objectives detailed in Question 3a was achieved.

4B. What support/technical assistance do you envision needing in order to evaluate the impact of the work you propose?

(max. characters: 1,000)

As noted above, technical assistance will be provided by the College's Director of Institutional Research. In addition to working with the Faculty Inquiry Group (FIG) to develop the formative and summative evaluation devices, she will also assist in the design of surveys administered to students at the end of each course in the pre-college math sequence. Additional support will be provided by personnel in Student Support Services and Student Records.

The Director of Institutional Research will also assist in the analysis of the findings and the identification of trends.

Section 5

Sustainability Plan

5A. What is the potential for continuing, and if possible scaling up, this work beyond the grant period, and how are you addressing directly this issue of sustainability as part of your proposed work?

(max. characters: 2,000)

The potential for continuing and scaling up the project after the grant period is great.

That the project grows out of and builds on a College-wide assessment and improvement process demonstrates the administration's commitment to project success and sustainability. At least equally significant is the pre-college math faculty's leadership role in making the improvements proposed herein. When both the top administrators and the faculty are working in the same direction with the same goals, the likelihood of ongoing success is extremely high.

Many of the products created through this grant project will become permanent additions to the math library available to pre-college math faculty. The packet for part-time faculty that will include course outcomes, tests, syllabi, and the like will be continuously updated and made available to all extended campuses as well as posted on the College's Teaching and Learning web page.

Over time, the packets will be expanded and improved, ultimately becoming a teacher's manual for all math instructors. This scaled up version of the packet created during this project will eventually include a College-wide philosophy statement about teaching math, examples of effective pedagogical approaches, teaching notes and guides, lesson plans, and more.

Any books, literature, or other math resources that are collected during the life of the grant will be put in the library and made available as a resource for faculty, tutors, and students.

Relationships built through professional development activities that take place during the grant period will continue to grow and flourish over time, providing faculty and tutors with ongoing formal and informal learning opportunities.

5B. What support/technical assistance do you need in order to be able to address the long-term sustainability of the work you are proposing?

(max. characters: 1,000)

The primary support needed to address the project's long-term sustainability will be financial. While it is true that all colleges could put more financial support to good use, this is especially true of tribal colleges. There are always more worthy projects than there are funds to support them.

That said, the best way to increase the College's revenues is to increase its student count. Students who fail to complete their first developmental education course often do not return the following quarter. Through this project, we will create a pathway that enables students to work through their pre-college math courses successfully, resulting in higher course completion and student retention rates. This, in turn, will result in increased enrollment, growing College revenues, and further enhancing the institutional commitment to the program.

VP of Instruction Approval

5C. My college's Vice President of Instruction has reviewed and approved this application.



Section 6

Budget Narrative

6A. Description of how funds will be used for Project Development Salaries, Wages, and Benefits.

Wages for all 5 hourly Faculty Inquiry Group (FIG) members for two one-hour weekly meetings during spring quarter

Salaries and wages for all 9 Faculty Inquiry Group (FIG) members for 5-day work session during summer quarter

Standard hourly wage for part-time faculty to teach two courses during spring quarter to provide faculty release time for full-time faculty to work on this project

Standard benefits package for all full-time and hourly employees

6B. Description of how funds will be used for Project Development Goods and Services.

Materials books, copying, printing, office supplies for spring quarter meetings & professional development; same for summer workshop plus addition of meals for participants

6C. Description of how funds will be used for Project Development Building Rental and Utilizations.

6D. Description of how funds will be used for Project Development Travel.

Travel for all 9 FIG participants to nearby colleges/universities for professional development to be reimbursed at government approved rates

6E. Description of how funds will be used for Project Development Contracts.

Contracts with those who will provide professional development

6F. Description of how funds will be used for Instruction Salaries, Wages, and Benefits.

6G. Description of how funds will be used for Instruction Goods and Services.

6H. Description of how funds will be used for Instruction Building Rental and Utilizations.

6I. Description of how funds will be used for Instruction Travel.

6J. Description of how funds will be used for Instruction Contracts.

6K. Description of how funds will be used for Administration Salaries, Wages, and Benefits.

10% of Salaries and Wages for Project Development to support administrative oversight and reporting to grantors

Standard NWIC benefits package for full-time salaried employees

6L. Description of how funds will be used for Administration Goods and Services.

6M. Description of how funds will be used for Administration Building Rental and Utilizations.

6N. Description of how funds will be used for Administration Travel.

6O. Description of how funds will be used for Administration Contracts.

Budget

Institution: Northwest Indian College

Activity	Salary and Wages	Employee Benefits	Goods and Services	Building Rental & Utilizations	Travel	Contracts	Total
Project Development	\$14,597.00	\$2,193.00	\$518.00	\$0.00	\$250.00	\$500.00	\$18,058.00
Instruction	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Administration	\$1,460.00	\$482.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,942.00
Total	\$16,057.00	\$2,675.00	\$518.00	\$0.00	\$250.00	\$500.00	\$20,000.00