

## **PANEL SUMMARY:**

Math and Science Partnership  
Panel Summary of Panel Discussion

### Intellectual Merit

The review panel was impressed with the proposal's focus on Navajo culture and the utilization of tribal members to intellectually engage students. It was felt that the Dine project could serve as a model of how to translate everyday experiences into the scientific and mathematical concepts important to academic success. It is significant that the influence of learning style is addressed with examples of how to change classroom culture so that students ask questions and initiate inquiry.

### Broader Impacts

The Community Math-Science Relationships in Navajo Nation Schools proposal has the potential to improve the achievement for an under represented group of students. A unique aspect of the proposal is the utilization of family and community members as integral parts of the learning process. The project will be documented, assessed, and disseminated to other Reservation schools. The research may also contribute to the development of models for multicultural education.

### Major Strengths

The panel identified the following strengths in the proposed project:

1. The proposal seems to have been crafted by a group of genuinely caring individuals. This comes through in the grant narrative.
2. There is a wealth of baseline data. The impact of the project on student achievement related to pedagogical change can be easily tracked.
3. A two-year college with a 4 year program for teachers can have a significant impact.
4. That Dine College has already renegotiated faculty work loads is impressive and shows commitment.
5. Annual benchmarks and outcomes for students, teachers, and the partnership are clearly outlined.

### Major Weaknesses/Concerns

The panel identified the following weaknesses in the project:

1. Sharing their model with other cultures is a good idea; but how will it translate? How does it scale up?
2. There are several inaccuracies and errors in the budget. There should be a closer attention to detail.
3. What is the math and science to be addressed by this proposal? There should be more detail. The few examples provided were excellent, but not nearly complete enough.
4. There is no clear indication of how long the inservice/professional development experiences will be. It is important that professional development be ongoing with follow-up opportunities. Will the teachers be remunerated for participation?
5. There is no evidence of lead personnel with a mathematics or science degree. The MSP model is based on mathematics and science higher education faculty being involved in leadership roles. The biographical sketches do not provide enough background data to determine the academic expertise of key individuals.
6. It is not obvious that the school districts were involved in writing the proposal. It appears to have been written by Dine college. Are the teachers invested and interested?
7. Action research is a powerful tool and reveals much about a teacher's classroom practice and students'

conceptions. The proposal does not make it clear how teachers will become informed about the action research process and why they would elect to participate. Is this something that teachers will be obligated to do or will they elect to be involved? Who will help them in the design of their projects and in the interpretation of the data?

#### Summary Statement

The panel questioned how Dine plans to revise its curriculum with no funds allocated in the budget for this process. Who is going to be involved? Is this an unfunded mandate? Does no funding mean that the college is committed? Curriculum change should be clearly addressed in the proposal. Have there been earlier attempts to address low student performance to and if so, what were some of the problems confronted? What indicators have changed to make the community ready for it now?

There was also a question about how the teacher base will be obtained? Is it a goal to eventually include all of the middle and high school math/science teachers?

The panel liked the DHL approach as a model. Is there research to show that this model will have the impact claimed on student achievement? If there is, it should be referenced. If there is no literature showing that this model works, then this should be submitted as a research grant.

Having an experienced grant writer review the next proposal prior to submission would likely help to clarify areas of ambiguity.

#### Reviewers' Summary Rating of Relevant, Prior NSF-Supported Work

Excellent \_\_\_\_\_ Fair \_\_\_\_\_  
Very Good \_\_\_\_\_ Poor \_\_\_\_\_  
Good \_\_\_\_\_ No relevant, prior NSF support X

Rationale:

#### Panel Recommendation

Highly Competitive \_\_\_\_\_  
Competitive \_\_\_\_\_  
Not Competitive X

Budget Request (for "highly competitive" or "competitive" proposals) Is the budget request commensurate with the proposed activities (scope of work)?

**PANEL RECOMMENDATION:** Not Competitive