

**Regenerative Medicine Minnesota
2017-2018 Education Award Progress Report**

Grant Title: Innovators of the Future: Community Based Science Program, Bois Forte

Grant Number: RMM-2017-K12ED-05

Requester: Anna Wirta Kosobuski, EdD

Project Timeline: 5/30/2017-5/29-2018

Brief description of project:

Innovators of the Future: Community-Based Science Program centers on a partnership with Bois Forte Band of Chippewa. The project provides year-round science, math, and research career exploration opportunities for K-6th grade Native American children at Nett Lake Elementary School. Program activities integrate health, wellness and Native American culture.

Where did this project take place?

Nett Lake Elementary School located on Bois Forte Reservation.

People impacted by project and where they came from:

All Nett Lake Elementary School students (55 in total) participated in *Innovators of the Future* activities. Nett Lake Elementary also collaborated with the nearby Northwoods School on five activities and field trips across the project year thus expanding exposure to valuable science learning to over a combined 200 students from both schools. Some Bois Forte elementary students attend Northwoods, this school is also where Nett Lake Elementary School students go after completing 6th grade.

Nett Lake Elementary School students participated in two field trips to the University of Minnesota Medical School Duluth Campus (UM MS Duluth Campus) where they engaged with impactful role models including medical school post-docs, medical students and faculty. The benefit of this activity was two-way, the children gained important science learning in a professional school setting while the adults who facilitated activities had opportunities to connect and effectively communicate with a group of young, diverse students.

The Bois Forte project also integrated community involvement, particularly in those activities that emphasized cultural learning components. In Native American culture, elders are highly respected and have the responsibility to pass customs and traditions. Nett Lake Elementary School brought in community elders to help plan, present, assist and supervise some activities. This decision to extend beyond the school walls fostered community connection, ownership and engagement with positive, meaningful role models who are a part of the everyday lives of the children. A total of twelve elders were a regular presence in project activity.

What was the outcome of the project? (Did the project work the way you expected it to? What were the successes? What were the failures? How did it impact regenerative medicine in Minnesota?)

The *Innovators of the Future Community Based Program* with Bois Forte exceeded expectations (Goal 1; Activity 1.1, 1.2, 1.3). The curriculum developed by Nett Lake Elementary included math, science, health and wellness, Native American cultural

components and had the added step of community involvement (Goal 1; Activity 1.2). A larger and more diverse group of elementary students was served due to the motivation, creativity and desire for student inclusivity of the Nett Lake Elementary School Principal (who is also the Superintendent for Bois Forte) and teachers. The project goal was to serve 50 children, in all, it served over 200 (Goal 1; Activity 1.1).

UM MS Duluth Campus hosted Nett Lake student visits two times. The first visit in November 2017 included all 55 of Nett Lake's K-6th grade students. The second visit on May 14, 2018 included 24 4th-6th graders. Feedback from Nett Lake Elementary School students, teachers and administration reflected strong satisfaction. Medical school visits provide important exposure for young students to the post-secondary institutional environment thus helping to alleviate anxiety and apprehension to attend such schools in the future (Goal 1; Activity 1.3). They also afford the opportunity to closely interact with positive role models who humanize the notion of a scientist and help instill a vision as future graduate students, scientists, medical students or health professionals (Goal 1; Activity 1.3). Student surveys showed improved science understanding; moreover, many responses reflected clear motivation for higher education, excitement for science and overall enjoyment of the learning. (Goal 1; Activity 1.3) Survey results were submitted to Regenerative Medicine Minnesota, they will be resubmitted upon request. The visits were also well-received by the medical school community; this was the case whether individuals engaged directly with the students or were witness to the children's energy and motivation for learning. UM MS Duluth Campus faculty, administration, staff and students made pointed efforts to express their gratitude and delight for the presence of and occasion to interact with the children.

This project year also saw the implementation of science activities that help meet Minnesota academic standards via distance learning (Goal 1; Activity 1.3). This was made possible by the introduction of distance technology at Nett Lake Elementary School through funding from a local non-profit organization. Due to an urgent personal situation in the life of Dr. Wirta Kosobuski, only one session was held in November 2017 with the 4th grade class. The distance learning design includes a science experiment led by UM MS Duluth Campus faculty and graduate students. The elementary school children are connected using the distance technology and under the supervision of their classroom teacher, participate in the science activities presented at medical school. The session held was led by a Dr. Wirta Kosobuski and another Biomedical Sciences Department faculty member and explored states of matter through an experiment using popcorn. Student feedback indicated an improvement in understanding and enjoyment of learning (copies of written survey available on request) (Goal 1; Activity 1.3). In the upcoming year, plans are in development to implement this program on a regular basis with lessons developed in collaboration with another RMM Education Grant recipient.

Included here is a summary of successes and challenges submitted by the Nett Lake School Principal/Bois Forte School Superintendent.

- Successes
 - These grant dollars opened up many doors that would not have been possible. With such a small student body we don't generate enough revenue that would allow us the opportunity to participate in most of the events.

- Attending the activities provided the perfect opportunity for the older students to work the younger students in a fun and interesting way. Using the older students as mentors and role models benefited both the young and old.
- It's important expose student at an early age about career opportunities in the STEM fields.
- The two on site visits were very educational and students really enjoyed the staff at UMD. The school would like to continue these.
- Challenges
 - Some parents did not allow their child participate on some of the away field trips because the parents felt that everything their children needed could be provided by the tribe and at the reservation. This mindset has limited the students' exposure to learning and career opportunities outside the reservation.
 - Other barriers are the size of our village and its geographical location. We are very isolated which puts us closer to nature, but more distant from technology and manufacturing. That is why the visits to UMD, the Science Museum and STEM day in Hibbing are important.
 - It was our hope that we could have used our telepresence system to a greater extent with UMD.
 - As we reflect on the activities provided through this grant I believe we did a very job exposing all grade levels to age appropriate STEM activities. We covered areas in science, technology, engineering and math, but in the area of regenerative medicine we may have fallen short.

Innovators of the Future Community Based Science Program, Bois Forte was a definite success. While there are some challenges where resolution is out of reach of this project, where barriers can be addressed, plans are in place to do so. Connection with other professionals, including other RMM award recipients, will assist in addressing the need for age-appropriate resources for regenerative medicine content. Additional distance learning sessions will be implemented in Fall 2018. Areas identified as successes will continue and where appropriate, be refined or expanded. For example, visits to the UM MS Duluth Campus and Nett Lake's community involvement will continue. A primary activity for Dr. Wirta Kosobuski is to seek additional funding in the upcoming year to help support project expansion down to Pre-K and up to 12th grade. The Bois Forte partnership provides the necessary connections to build this. Bois Forte's Head Start program is housed in the same building as the elementary school. The collaborative partnership of Nett Lake with Northwoods School presents the ideal venue to implement 7th-12th grade programming as Northwoods includes middle and high school and is also the school Nett Lake Elementary School students attend after 6th grade. Discussion of this possibility has been touched upon by Dr. Wirta Kosobuski and Nett Lake's Principal.

Noteworthy and celebratory, the Minnesota Department of Education reported that Nett Lake Elementary School experienced a significant rise in their 2017 state academic math and reading assessments. Unfortunately, because only 5th grade students take the science assessment, there were too few students to measure Nett

Lake results reliably and confidentially. There had been a slight achievement drop in 2016; in 2017, the students performed admirably, far surpassing achievement levels in prior years. It is difficult to demonstrate a direct link between the student performance and this project, Nett Lake's Principal identified a number of initiatives implemented by the school, the activities and resources of this project are part. However, the impact a project as RMM *Innovators of the Future* can have on student self-efficacy and resulting overall achievement cannot be overlooked. The 2017 Nett Lake Elementary School and statewide results for Native American students are illustrated below:

Percent Native American Students Meeting 2017 Minnesota Academic Standards, Nett Lake Elementary School and Statewide

Subject	Exceeds		Meets		Partially Meets		Does Not Meet	
	Nett Lake	Statewide	Nett Lake	Statewide	Nett Lake	Statewide	Nett Lake	Statewide
Math	17.2	7.6	44.8	23.3	20.7	25.6	17.2	43.5
Reading	17.2	6.8	51.7	29.0	20.7	24.4	10.3	39.8
Science	CTSTR	4.2	CTSTR	24.5	CTSTR	27.9	CTSTR	43.4

CTSR: Count too small to report

Source: Minnesota Department of Education Minnesota Report Card

Please list any of the following that have resulted from your Regenerative Medicine Minnesota grant funding:

- Publications and/or manuscripts submitted for publication
 - Pre-Premed: Pipeline Efforts Steer Elementary School Students into Medicine”. *AAMC News*. January 9, 2018. <https://news.aamc.org/diversity/article/pre-premed-pipeline-efforts-steer-elementary-school/>. (includes interview with Dr. Wirta Kosobuski).
 - “Nett Lake Elementary Partners with the University of Minnesota Medical School, Duluth, Creative Lesson in Regenerative Medicine”. *Bois Forte News*. January 2018. <http://www.boisforte.com/pdf/BFNJANUARY2018-WEB.pdf>
 - Medical Minute, University of Minnesota Medical School Duluth Campus. November 3, 2017. <https://mailchi.mp/d/medical-minute-april-21-276911?e=e72c7c020c>
 - Medical Minute, University of Minnesota Medical School, Duluth Campus, January 12, 2018. <https://mailchi.mp/d/medical-minute-april-21-326743?e=e72c7c020c>
 - Medical Minute, University of Minnesota Medical School, Duluth Campus, May 18, 2018. <https://mailchi.mp/d/medical-minute-april-21-402303?e=e72c7c020c>
 - Medical Minute, University of Minnesota Medical School Duluth Campus. May 25, 2018. <https://mailchi.mp/d/medical-minute-april-21-406843?e=e72c7c020c>
- Disclosures/patents
 - Not applicable.
- Other grant applications and/or awards
 - A NIH National Library of Medicine (NLM) grant awarded in May 2018 to Dr. Wirta Kosobuski is directly linked to relationships built through this

RMM award. This NIH NLM project involves a partnership with Bois Forte Health and Human Services (HHS) to set up four health information kiosks with the goal of providing access for all Bois Forte band members to credible health resources and their own electronic patient health records. The collaborative relationship with Bois Forte HHS was established through visits to the Nett Lake Elementary School.

Responsible Spending: Please let us know how you spent the money. Any unspent funds must be returned.

All funds (with the exception of indirect costs) associated with this RMM project went directly to Nett Lake Elementary School for their student activities.