ABSTRACT

The purpose of this Equity Project to develop and create Navajo infused Educational teaching modules: Curricula design and material development; Faculty development and teacher preparation; Student experiential learning; Student recruitment and retention; Instructional delivery systems and strategic partnership. The design of this program is in two-parts; 1) to prepare interdisciplinary science students for entry-level positions in food, agriculture, natural resources and human sciences through a 5-week summer STEM Curriculum development program in collaboration with Center of Dine Teacher Education. 2) Provide continuing educational professional development workshops for Navajo Nation teachers to integrate STEAM into their curriculum/lessons. Increase youth participation in STEAM related activities through Dine College. Findings of recent phases of this Equity project is making an impact on moving forward with improving project management; Keeping STEAM Team on course, defining the project goals and objectives, creating deadline, and working with sufficient team skills. In conclusion, the project will incorporate multiple evaluations to monitor the progress and efficacy of the program. The project will include school outreach activities, advisory meetings, teacher workshops, and k-12 summer student programs.
STEM OBJECTIVES

• Curricula design and material development
• Support STEM Methods Courses
• Design & Implement Workshops
• Design and Implement an annual STEM Festival
• Design and Implement a STEM Summer Camp
• Establish and Convene an Advisory Board
3-5th Grade Diné / Western Water Module

Background: The Diné have a high regard and respect for rain. When drought hits, they pray for rain. There are lessons young children are taught as to how one should act when it starts to rain and during rainfall. These lessons are learned by our people through watching how birds and animals act when rains come.

Duration: Five class periods
Day 1: Introduce, Explain
Day 2: Explore, Engage
Day 3-4: Elaborate/STEM
Day 5: Presentation/Evaluation

Lesson Summary: Students will learn that respect for rain was taught to the Diné through watching birds. How they settle down when they hear thunder and sit on the branches of the tree while it rains and do not move until the rain has passed and the rainbow emerges. Then they celebrate by chirping happily while flying around. The horses and sheep stop their grazing and stand reverently while it rains and then commence grazing after the rain stops. Sheep and cattle may run to puddles to taste the fresh rain water in appreciation and gratitude. From witnessing this, the people learned to show respect for rain. Children are taught to sit still while it rains. They cannot go outside and run in the rain. They may go outside after the rain has stopped and smell the moist earth, but they cannot splash in the puddles which is a show of disrespect. In this regard, they are also showing respect and reverence for the rain. In essence, the western society’s concept of “running in the rain” is not practiced nor accepted.

PreK 3rd Diné Content Standards:
Objectives:

Vocabulary
Níiná halchín  I’dí:í  K'oos bee halchín
Hooshi
Ní’dítii’  Hooshi
Nízhool  Naháltin
Tsohool yaa?í’  Ahóótsi
Ní’ íchíl’  Nááshníidi ííít’í

Focus Vocabulary: Ní’ íchíl’  Nááshníidi ííít’í

Day 1:

TPR: Sounds of the Rain
Vocabulary Study when it comes to cultural study.
Traditional Navajo Story: Horned Toad and Lightning

Day 2:

TPR: Sounds of the Rain

Introduce the following poem. Read the following to the students. Have student read with you twice.

K’oos it’íí, K’oos it’íí, ha’it’ií yáá’ní?’í?
Hooshi, Hoosí, ha’it’ií yáá’ní?’í?
Ní’dítíí, yáá’ní?’í?
Ní’dítíí’í, Ní’dítíí’í, ha’it’ií yáá’ní?’í?
Hooshi yáá’ní?’í

Circle Diagram Activity:  Níiná

* TPR - Total Physical Response. Is a method of teaching language or vocabulary concepts by using physical movements to react to verbal input. This process mirrors the way that infants learn their first language, and it reduces student inhibitions and lower stress.
* KWL - Know. Want to know. Learned. KWL charts can be useful when students are using the Scientific process.
CURRICULA DESIGN AND
MATERIAL DEVELOPMENT

3-5th Grade Diné / Western Water Module

Western Science Activity: Difference states of Water

Solid, Liquid and Gas states:

Students will be listing the different states of water. Students will understand the states of Solid, Liquid and Gas.

1. Students will start and form a line 15 feet away from the instructor.
2. Instructor will call out liquid. Students will link arms with one another and move towards the instructor.
3. The instructor man than say Solid. Count to five and turn around. Students must be linked together in pairs and shake. If the instructor does not see student active in the group. In at least four, they are out until next round.

Day 3:

TFR: Sounds of the Rain

Read the following to the student. Have student read with you twice.
K’o ts dihlí, K’o ts dihlí, ha’ášíłla yíní’?
Hóotítjígo yíshí’
Hóotítjí, Hóotítjí, ha’ášíłla yíní’?
Ni’dííshí’ yíshí’
Ni’dííshí’, Ni’dííshí’ ha’ášíłla yíní’?
Hóotítjígo yíshí’

Circle Diagram Activity Two: Students will recite above poem while pointing to the appropriate words in clockwise manner.

K’ot dihlí
Hóotítjígo
Níítsí
Ni’dííshí?

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* KWL – Know, Want to know, Learned. KWL charts can be useful when students are using the Scientific process.
SUPPORT STEM METHODS COURSES

Outreach program with Lukachukai Community School & other local schools

- Sessions during enrichment hours of LCS providing STEM Activities
  - Online Coding, working with OzoBot Classroom kits, Robotics workshops kits
- Served as Science Fair Judge for LCS
STEM workshops are scheduled annually during the year for spring and fall. Workshops are hosted around school calendars to allow plans to attend the event in spring and fall seasons. Partnerships are created with organizations and institutions to bring STEM related resources to Navajo schools. MOU are created to allow students to participate in STEM enrichment workshops. During the STEM Enrichment workshops, Students are given hands-on project base learning related to STEM. During teacher workshops, professional development hours are given in a certificate form.

- Teacher workshops
- Summer Camp
Partnership with STEM Equity with Institute for tribal environmental professionals in effort to Design & Implement Workshops. Goal of this project is to develop and support awareness and understanding of water quality issues and their relationship to personal, public and environmental health among Navajo schools and teachers.

- Teacher Workshop: March 29, 2019
- Teacher Workshop: March 30, 2019
- Certificates are created for participants
- Teachers received 6hrs of professional development
- Teachers receive 3 ProjecteWET teacher’s Guides
- cross-curricular,
- hands-on, inquiry-based activities and
- lessons you can implement right away
YOUTH CAMP

Camps are designed to provide hands-on project-based learning to K-12 students on the Navajo Nation. The program also allows networking and the creation of partnerships with other STEM organizations to bring education on natural resources to the program. The camps usually consist of variety facilitators/presenters to provide hands-on learning resources and hands-on project-based learning techniques to students.

- Students gain awareness and understanding of safeguarding and restoring valuable natural resources by evaluating the health of a watershed through:
- collecting basic ecology data at local streams and lakes, classifying plant vegetation,
- identifying sources of pollution and human impacts, and observing wildlife habitat,
- forest,
- rangelands and watersheds.
ENVIRONMENTAL YOUTH CAMP

Students received hands-on training through field labs, workshops and field activities. The program involved middle and High School students. Students were selected based on the interest in Environmental science, agriculture, biology and water cultures.

STEM Activity: Then & Now!

Students:

• literature reading related to Tolani Lake past historical context.
• Identify environmental issues that impacted TLE throughout history.
• Compare past environmental issues with the ones we face today.
• Recorded students thoughts in STEM journals.
STEM FESTIVALS

The STEM Festival emphasizes science, technology, engineering & math activities. STEM partners will consist of individuals representing different institutional research/outreach programs, faculty members, students, local community members and Universities. Activities conducted are relevant to student’s grade levels where facilitators run sessions with students throughout the day.

- Non-competitive celebration of great ideas and problems in STEM
- Facilitators provide expertise & Innovative Ideas
- Organizations share valuable contacts & information
- Support and services between Departments, Institutes, & Universities
STEM FESTIVAL

Looking Forward: Fall 2019 STEM Festival