



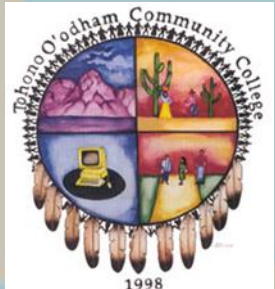
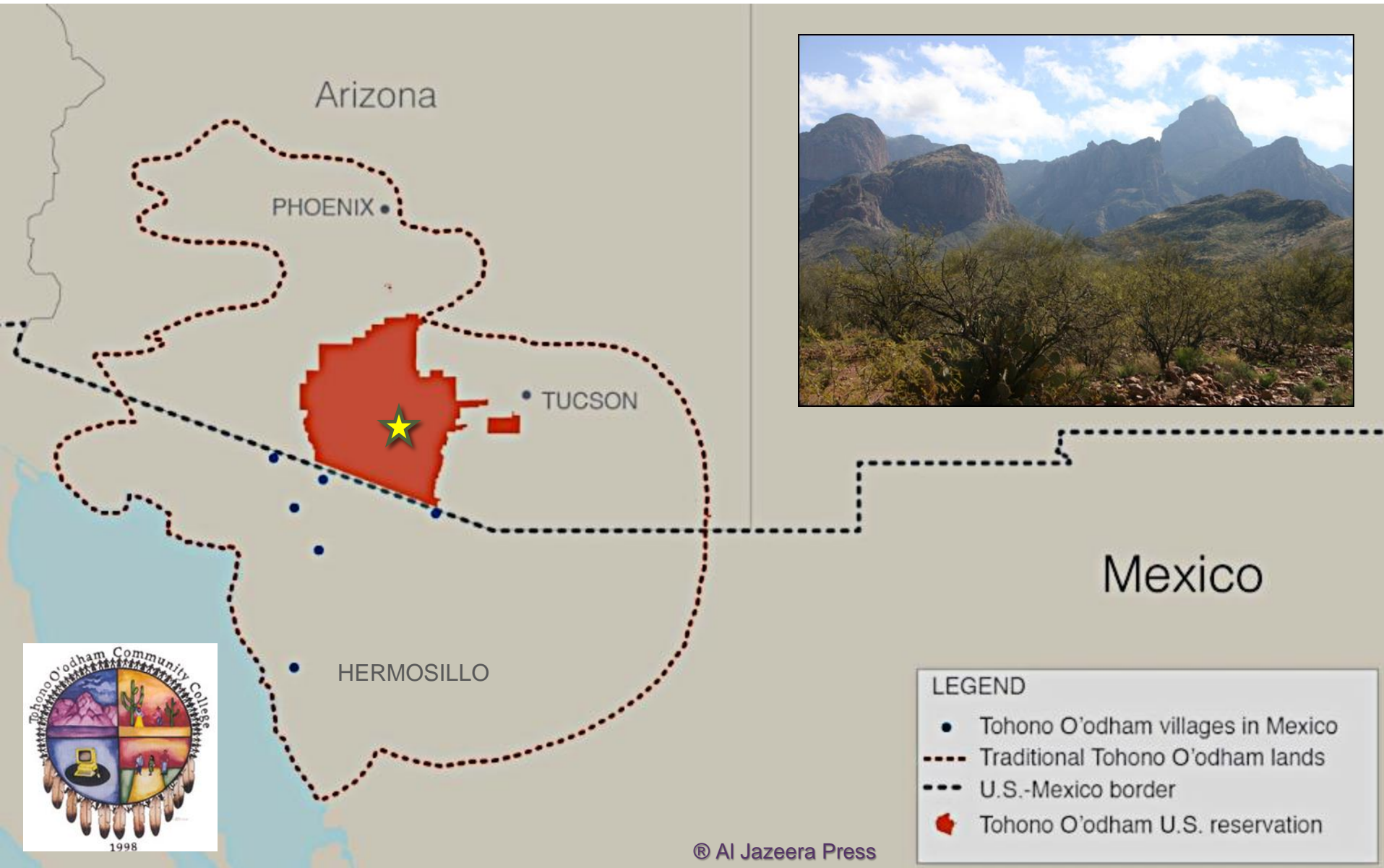
DEVELOPMENT OF THE MAN IN THE MAZE INDIGENOUS EDUCATION MODEL

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Tohono O'odham Community College—The Land





Tohono O'odham Community College

Mission:

“As an accredited and land grant institution, TOCC’s mission is to **enhance our unique Tohono O’odham Himdag** by strengthening individuals, families, and communities through **holistic, quality higher education services**. These services will include research opportunities and programs that address academic, life, and development skills..”



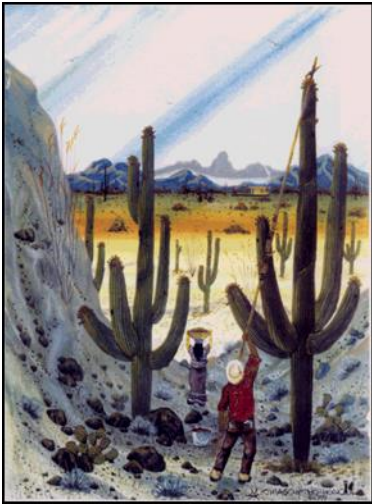


Tohono O'odham Community College



O'odham Himdag is the culture, way of life and values that are uniquely held and displayed by the Tohono O'odham.

- **Core Values or T-So:son:**
 - T-Wohocudadag – Our Beliefs
 - T-Apedag – Our Well-Being
 - T-Pi:k Elida – Our Deepest Respect
 - I-We:mta – Working Together



My Story & Background



- **1994**—Francis Manuel (Elder)—learned stories, songs and history of the O’odham
- **2005**—Science Faculty Member to build a Science program based on the Himdag
- **2006-2009**—Graduate Courses in Indigenous Education
- **2015**--National Science Foundation Fellowship, Opportunities for Underrepresented Scholars 2015
- **2016**--Post graduate Certificate in Academic Leadership, Chicago School of Psychology



Problem Statement

- How do we unify our educational programs and align our programs with the mission to offer culturally-based curriculum?
- How do we know we are fulfilling our mission of “enhancing the O’odham Himdag and providing holistic, high quality education?”
- How do we tell our story and provide evidence to our accrediting body and funding agencies?



2013-2015 Program Level Assessment

A.S. in Life Science Outcome 3: Display a sense of place Service Learning Capstone Project

	Exemplary (40 points)
Problem Identification	Demonstrates the ability to construct a detailed, clear and insightful problem statement with evidence of a thorough understanding of the health or environmental issues on the Tohono O'odham Nation including all relevant contextual factors.
Problem-solving	Proposes one or more solutions that indicate a deep comprehension of the problem. Solutions are appropriate to the cultural and environmental factors on the Tohono O'odham Nation.
T:So-son	Demonstrates a sophisticated understanding of T:So-son by appropriately incorporating one or more core values into the Service Learning Project and eloquently articulating this understanding through reflection and analysis.

The Need for an Indigenous Education Model

- ❖ Shared cultural metaphors embody tribal epistemologies and worldviews and strengthen identity
- ❖ Indigenizing and Decolonizing Western education
- ❖ Unified and systematic approach to culturally-based education
- ❖ In the words of indigenous scholars:

“Comprehensive restructuring of culturally responsive education that takes into account Indigenous epistemologies and tribal communities” (Castagno and Brayboy 2008)

“Use of the cultural metaphors based on symbolic expressions “that reflect the metaphysical, ecological and cultural constructs of a tribal epistemology” and which reflect “common understandings and shared foundations for traditional ways of learning” (Cajete 2005)

- ❖ But, how do tribal colleges achieve this?



Purpose of Project

Development of an Indigenous Education Model for the Associate of Life Science Program at Tohono O'odham Community College (TOCC)

To develop an indigenous education model for TOCC based on a cultural metaphor

Apply the model to curriculum development and program assessment

To create a methodology for creating an indigenous education model for other TCUs

Methodology

Phase 1

- College-wide training in the Indigenous Evaluation Framework
 - *Partnership with AIHEC Indigenous Evaluation Framework Project*
 - *May 2015*

Phase 2

- Creation of Man in the Maze Model with elder and faculty
 - *NSF AIHEC WIDER Project*
 - *Summer 2015*

Phase 3

- Pilot Model Using PBL Units
 - *AY 2015-2016*

Phase 4

- Refine Model for A.S. of Life Science Program
 - *Spring 2016*

Indigenous Evaluation Framework

- Evaluation processes need to be based on a cultural framework unique to each tribal community (LaFrance and Nicholls 2010)
- In order to be robust enough and value different “ways of knowing”
- Four core values: people of place, recognizing our gifts, honoring family and community, and respecting sovereignty

**TOCC
Training
May 2015**



Introduction to the Man in the Maze

- *Natural symbol for holistic educational journey founded on the Himdag.*
- *Represents a person's journey through life and reaching for one's dreams.*
- *Rich in multiple layers of meaning and is reflective on one's journey to both inner and outer knowledge through life.*



Pilot Project—NSF AIHEC WIDER Grant

Using Problem-based Learning Model to Promote indigenous Sustainability and Improve Learning in Math and Science

- Appropriate application to create and apply the model
- STEM PBL units focused on themes of environmental sustainability, health and well-being and incorporated T-So:son
- Team PBL:
 - Camillus Lopez, Elder, Tohono O'odham Culture Faculty
 - Jorge Guarin, M.S., Mathematics Faculty
 - Adrian Quijada, Ph.D., Science Faculty



Teachings on the Man in the Maze

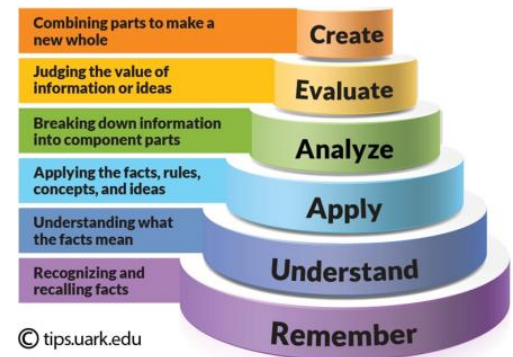
- *The Man in the Maze/I'itoi Ki: is a life-journey that follows a person's life cycle. A visual map that can be utilized to give a person a measurement tool.*
- *The dark spot in the center symbolizes the four major life sacraments that every person must pass through to complete the journey. The path leads persons to four encounters with the dark spot. Birth, Puberty, Responsibility and Acceptance to the completion of a life.*
- *The symbol can be adapted to any process or format as it provides an assessment for all persons involved to amend the material as completion is attained. (C. Lopez 2015)*



MAN IN THE MAZE Model





Course or Unit Level

- Each unit is framed the cultural symbol and wisdom of the Man in the Maze.
 - Each successive journey represents mastery of a higher level of learning.
 - Based on Bloom's taxonomy, these are:
 - First assessment: Knowledge**
 - Second assessment: Understanding**
 - Third assessment: Application**
 - Fourth assessment: Analyzing/Evaluating/Creating**
- Each journey builds on the last



MAN IN THE MAZE Model for Course or Unit Level Based on the four journeys



-  First Assessment: Knowledge
-  Second Assessment: Understanding
-  Third Assessment: Application
-  Fourth Assessment: Analyzing/Evaluating/Creating

Unit Level Application

BIO 154N Global Change Biology: Climate Change on the TON-- the Water-Food Nexus

	Goals and outcomes	Assessment
First Journey <i>(Knowledge)</i>	Describe traditional and modern uses of water on the Tohono O'odham Nation	Quizzes
Second Journey <i>(Understanding)</i>	Articulate indigenous perspectives and worldview of water, explain the relationship between water and food on the Tohono O'odham Nation,	Discussions, reflections, and short homework assignments.
Third Journey <i>(Application)</i>	Identify potential impacts of climate change on both traditional and modern water availability for the O'odham.	Individual written assignments
Fourth Journey <i>(Creating)</i>	Develop an adaptation plan for meeting the future water and food needs of the Tohono O'odham Nation that incorporates includes traditional ecological knowledge, indigenous viewpoints on water and T-So:son or cultural core values.	Collaborative Group Project to create a Climate Change Adaptation plan for the Tohono O'odham Nation

Problem-based Learning Units

MAT 220 Calculus I

Limits and their applications on the Tohono O'odham Nation

Understanding the limit concept by using a cultural framework

Students learn the concept of limit, apply its mathematical properties and explore how this central idea in Calculus could be presented via iPads. Students will have a discussion on how cultural values, such as the "Man in the Maze" would produce a connection with mathematical concepts like limits.

First journey: Knowledge

- Describe the mathematical and intuitive definition of limits.
- Describe the concepts used in this definition.
- Describe the misconceptions in the limit definition.

Second journey: Understanding

- Explain how close is close in the limit idea.
- Explain the parts involved in approaching the limit.
- Interpret how the "Man in the Maze" can support an alternative way to define limits.

Third journey: Application

- Identify applications of limits at the Tohono O'odham Nation.

Final journey: Analyzing/Evaluating/Creating

- Analyze the idea of reaching a limit.
- Develop a strategy for evaluation of limits.
- Review the limit process. Create an approach to present this concept in your own words.
- Evaluate your approach and modify the plan if needed.

BIO 105 Environmental Biology

Ecological Relationships and Ways of Knowing in the Sonoran Desert

Students learn about Sonoran desert ecology, Western and traditional ways of knowing with a special emphasis on t-imigi or inter-relationships. Students investigate these relationships by applying their knowledge to an ecological question and reflecting on how this increased their understanding of t-imigi or interrelationships.

First journey: Knowledge

- List the 3 steps in the process of Western Science.
- Know the three rules for scientific experimental design.
- Define ecology.
- Describe biotic and abiotic interrelationships.

Second journey: Understanding

- Identify an independent and dependent variable.
- Compare and contrast O'odham Ways of Knowing and Western Scientific Ways of Knowing.
- Explain how the Himdag value of t-imigi relates to ecology and the story of the Rain and the Wind.

Third journey: Application

- Apply knowledge of ecological principles to create a hypothesis to an ecological question.
- Develop an experiment to test a hypothesis.

Fourth journey: Analyzing/Evaluating/Creating

- Conduct a field-based scientific experiment.
- Analyze and interpret data using mathematical and ecological principles.
- Prepare a scientific report and presentation.
- Reflect on understanding of the Himdag value of t-imigi.

BIO 100 Biology Concepts

Diabetes and Cancer risks on the Tohono O'odham Nation

Understanding the biological and cultural basis

Students learn the biological principles that make people susceptible to cancer and diabetes and explore why recently Native Americans are particularly vulnerable. Students will have a discussion on how Himdag principles can help to reduce vulnerability.

First journey: Knowledge

- Describe the medical and biological basis of cancer and diabetes.
- Describe the current situation of cancer in diabetes affecting Native Americans.
- Describe the causes and habits that trigger cancer and diabetes.

Second journey: Understanding

- Explain how diet and habits disrupts the balance in our cells and body to trigger cancer and diabetes.
- Explain the factors and causes that are raising concerns on the Tohono O'odham Nation.
- Interpret how Himdag values can support a preventive attitude towards cancer and diabetes.

Third journey: Application

- Identify the specific factors affecting vulnerability to cancer and diabetes at the Tohono O'odham Nation.

Final journey: Analyzing/Evaluating/Creating

- Analyze current policies and actions in place at Tohono O'odham Nation to reduce cancer and diabetes risks.
- Develop a prevention plan to be implemented among students and staff at TOCC that incorporates medical evidence and Himdag values towards cancer and diabetes prevention.
- Evaluate the reception of the plan, welcome feedback and modify the plan based in cultural opinions and views.

BIO 154 Global Change Biology

Climate Change on the Tohono O'odham Nation

The Water-Food-TEK Nexus

Students learn about climate change impacts on food and water on the Tohono O'odham Nation and create a climate change adaptation plan that includes climate change science and traditional ecological knowledge.

First journey: Knowledge

- Describe traditional and modern uses of water on the Tohono O'odham Nation.
- Describe traditional and modern food production on the Tohono O'odham Nation.
- Describe current and changes in temperature and precipitation patterns in the Southwest U.S.

Second journey: Understanding

- Articulate indigenous perspectives and worldview of water.
- Explain the relationship between water and food on the Tohono O'odham Nation.
- Interpret the traditional O'odham calendar from the perspective of traditional food and water resources.

Third journey: Application

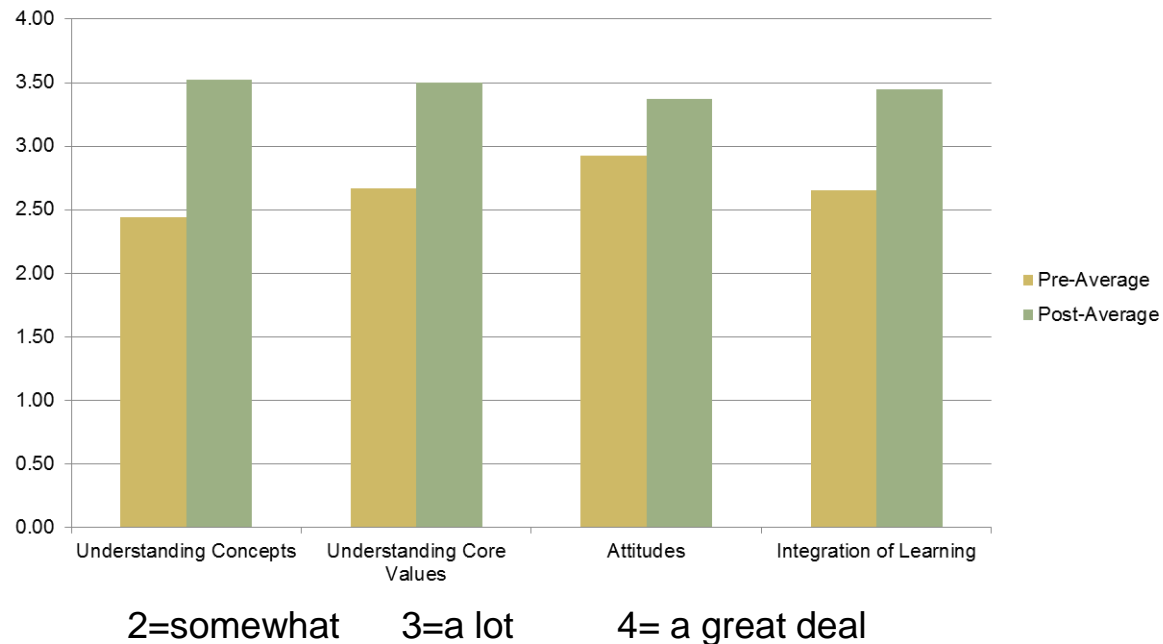
- Identify potential impacts of climate change on both traditional and modern water availability for the O'odham.

Final journey: Analyzing/Evaluating/Creating

- Analyze water policy scenarios for inclusion of Native Americans as stakeholders and incorporation indigenous values.
- Develop an adaptation plan for meeting the future water and food needs of the Tohono O'odham Nation.
- Evaluate a climate adaptation plan for comprehensiveness, scientific validity and inclusion of cultural values.

What we learned

- The model promotes success in student learning
- Over 60 students in 4 STEM courses
- Results Indicate Improvement In:
 - Student Learning of Math & Science Concepts
 - Understanding of Cultural Core Values
 - Attitudes Toward Math & Science
 - Integration of Learning



What We Learned

- ❖ Reflects the natural learning process of acquisition of knowledge and discovery.
- ❖ Creates a framework where O'odham students acquire a unique sense of cultural ownership
- ❖ Promotes a culture of on-going assessment and ensures that learning and assessment occurs at successive levels of Bloom's taxonomy.
- ❖ Model for curriculum design as well as evaluation and assessment (backward design approach).
- ❖ Serves as an indigenous curriculum map.



What We Learned

- The Man in the Maze Model is adaptable to any program or educational unit at TOCC from unit to course to program. Some examples of applications discussed at the workshop:
 - GED Program
 - Painting Program
 - Research Course
 - Business Course



The Next Step--Refining the model

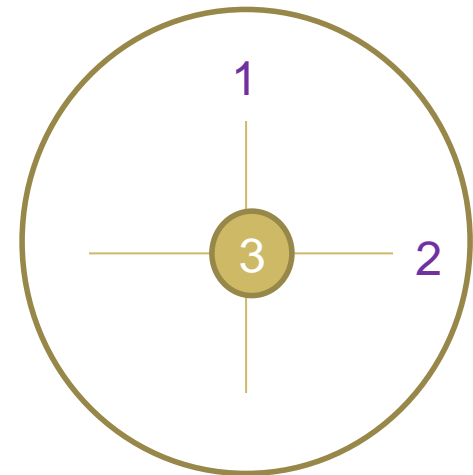
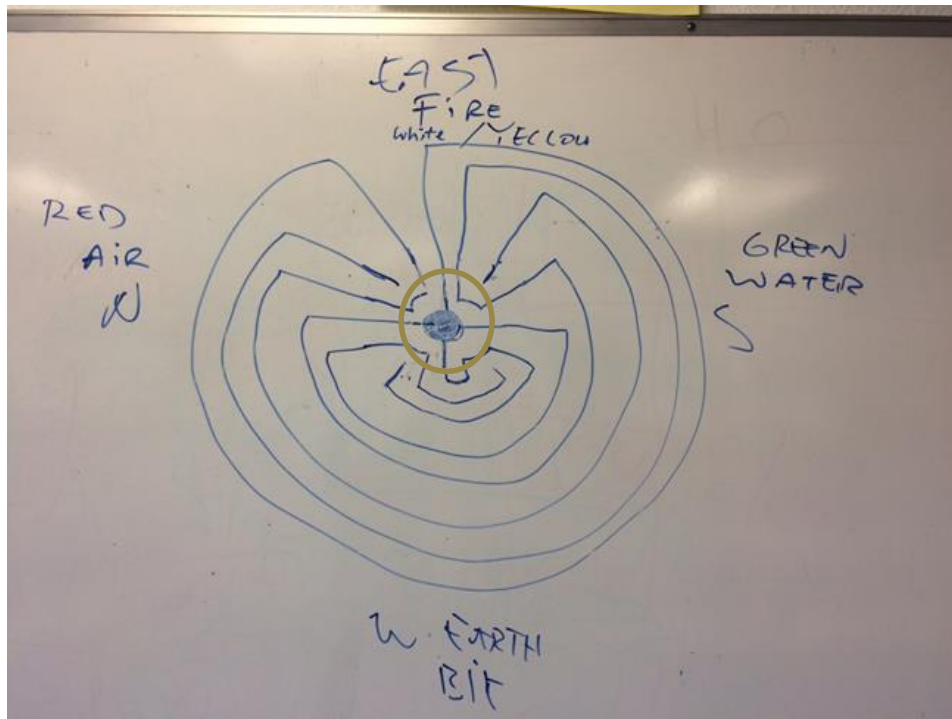
- Create a holistic approach by including the inner as well as the outer learning journey
 - Inclusion of student self-reflection and self-assessment needs to be added
 - This promotes intrinsic motivation and reflects the inner learning component as well as the outer learning
- It is important to give back to the community, so final journey will create something of value or share knowledge gained with the community



Program-level for A.S. Life Sciences

Holistic Model of Education

1st-2nd-3rd/Body-Mind-Spirit/Curriculum-Learning-True Self



Holistic Model of Education

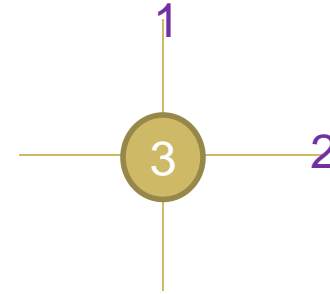
Holistic model of education because it takes into account the whole student as well as the relationship of the student with self, others and community

- Aims & Goals of the Journey:
 - ❖ Strengthen Identity
 - ❖ Personal Transformation—one's body, mind and spirit are involved in the pursuit of the true self and knowledge
 - ❖ Benefit to the community

It is an indigenous education model because it takes into account the *“unified experience of being a human being”* (Deloria 1999)

Program-level for A.S. Life Sciences

Holistic Model of Education



1st-2nd-3rd/Body-Mind-Spirit/Curriculum-Learning-True Self

	Curriculum	Learning	True Self
First journey:	Introduction of PLO's	Assessment at Knowledge Level (I)	Student Self-Assessment 1 (Identify Goals, Timeline & Obstacles)
Second journey:	Reinforcement of PLO's	Assessment for Understanding (R1)	Student Self-Assessment2 (Honest Check-in and re-evaluation)
Third Journey:	Reinforcement of PLO's	Assessment for Application of Knowledge (R2)	Student Self-Assessment 3 (Honest Check-in and Re-evaluation)
Fourth Journey:	Creating something of value using knowledge gained and sharing with community	Assessment for PLO's (A): analysis, evaluation and creation.	Student Self-Assessment 4 (Celebration of knowledge & completion of journey; reflection on service to community)

CURRICULUM MAP A.S. Life Science

PROGRAM LEVEL OUTCOMES		CORE COURSES						
		BIO 105N	BIO 181N	BIO 182N	BIO 154N	BIO 208N	BIO 298	BIO 299
1	Demonstrate knowledge of scientific concepts & vocabulary	I		R1	R2			A
2	Design and conduct a research project	I	R1			R2		A
3	Display a sense of place	I, R1				R2	A	
4	Apply critical and creative thinking skills to solve problems	I		R1	R2			A

Re-framing this project in the context of the Man In the Maze

- **First journey:** Training and creating the Man In the Maze Model
- **Second journey:** Understanding and exploring the model by applying it to the PBL units
- **Third Journey:** Applying this understand expanding the model to include a full program-level curriculum design and assessment
- **Fourth Journey:** Using this model to evaluate and assess the A.S. Life Science program



- First assessment: Knowledge
- Second assessment: Understanding
- Third assessment: Application
- Fourth assessment: Analyzing/Evaluating/Creating

Impact & Key Accomplishments

- Creation of a Teaching-Learning Community Committed to Culturally-based Curriculum & Assessment
- Transformation of teaching strategies & philosophy to include Indigenous Knowledge.



“The journeys of the Man in the Maze model helps to integrate tradition and science. Both are elements of knowledge that can be explored and learned as paths of the journey.”
Quijada 2016

Impact & Key Accomplishments

- ❖ Robust and culturally appropriate model for both curriculum development and assessment
- ❖ Systematic approach and unified vision of “**holistic, high quality education**” which “**enhances our unique Himdag**”
- ❖ Institutional transformation by building a culture of collaboration
- ❖ Provides a methodology and paradigm for indigenous education that can be applied to other institutions
- ❖ In press: **AICF’S Tribal College Research Journal** (Newberry et al. 2016)



The Future

- Applying the model across all of our programs
- K-12 Educational Model
- Applying the model to student retention (Student Services)
- Grant Evaluation



Thank you!

Questions, comments, insights?



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