

# Connecting Indigenous Knowledge and Western Science through co-design & XR on the Flathead Indian Reservation

Jonathon Richter<sup>1</sup>

<sup>1</sup> Salish Kootenai Tribal College, Montana, U.S.A.  
jonathon\_richter@skc.edu

## 1 Introduction

Since 2016, faculty in the Digital Design Technologies Program at Salish Kootenai College have conducted three years of co-design with area 7<sup>th</sup> – 12<sup>th</sup> graders, tribal college students, and expert tribal community members committed to solving local challenges through science, design, and computer programming workshops, problem solving, digital storytelling, art, game design, field trips, virtual reality experiences, and social media marketing. This group, known as “Flathead Tech4Good” has created numerous board games, videos, social media, story narratives, flyers, posters, and design ideas for solving local community challenges.

In 2016 – 2017, Flathead Tech4Good began their first year-long Community Challenge theme of “Food Sovereignty”. By the end of that first year, the group, led by students attending Glacier Lake School and Polson Public Schools had co-created a board game with the Tech4Good partners called “Feast or Famine”. In 2017 - 2018, the Community Challenge theme was “Water is Life!” and participants co-designed both a card game and a board game based on combatting aquatic invasive species. In 2018 – 2019, to be inclusive of the partners from the first two years (food and water) the co-design Challenge Theme has been “Community Health” and the Tech4Good partnership has expanded to include an animal/human health board game, a student science fair, augmented reality school community gardens, and almost a dozen classrooms doing a “Tech Challenge” that has them design Rube Goldberg contraptions-as-interpretations of local datasets about food, water, people, or animals.

This ongoing Action Research project to discover “what works” for community members of the Flathead Reservation – particularly young people – to access and meaningfully engage in co-design efforts around pressing challenges faced by the community has led to applying science, technology, engineering, and math expertise within a variety of cultural problem-based contexts. This poster presentation will showcase the products of the past three (3) years of Tech4Good Community Challenges, depicting the cultural contexts and critical inquiry within which these projects have been situated – demonstrating the connections between indigenous culture and western science and technology – and illustrate plans for next year’s 2019 – 2020 Flathead Tech4Good Community Challenge Theme: Climate Change, including the nine (9) sectors of community-based data T4G’s seeking to engage students and the community in partnership with the Confederated Salish and Kootenai Tribe’s Climate Change Advisory Committee – next year’s expert partners.

## 2 Research Questions

Research Question 1: What kinds of engagement leads to most meaningful co-design learning opportunities for STEM students to apply their emerging expertise?

Research Question 2: What approaches are best for the Salish, Pend Oreille, and Kootenai people to integrate their cultural knowledge with western science to solve complex, pervasive challenges such as food sovereignty, community health, and climate change?

A particular focus of this community effort has been on finding ways to intentionally connect traditional indigenous knowledge and western science. The project has created a Community-based Co-Design model to complement the Flathead Reservation community’s cultural traditions following the seasons and living as part of the lands of western Montana. This poster will show that model and display some of the artifacts of our past 3 years efforts – seeking input on improved measures of engagement, learning outcomes, and

Gathering community members, middle, high school, and tribal college students to meet with co-owners Rebecca and Brandon Goff of local game company Native Teaching Aids, Salish Kootenai College faculty, and challenge theme experts “across the seasons” to (a) storyboard and brainstorm the challenge in the Autumn; (b) Troubleshoot and Dive Deep in Winter; and (c) Playtest and Celebrate Accomplishments in the Spring.