Ute STEM Project: A Study in the Integration of Western Knowledge and Native American Knowledge Bases NSF AISL Grant No. 1612311

MASTER LIST OF ALL UTE STEM EVALUATION REPORTS (w/ links)

Process Evaluation
Process evaluation was designed to help the Ute STEM leadership and project team assess ongoing progress and learning, identify needed course corrections, and document the implementation of the project. Originally envisioned as occurring via online surveys 2x/project year over the five-year award period (and with the intention to include museum staff from Denver's History Colorado Center and Montrose's Ute Indian Museum, tribal representatives from the three participating Ute tribes—Southern Ute Indian Tribe, Ute Mountain Ute Tribe, and Ute Indian Tribe - Uintah and Ouray Reservation, archeologists and other scientists from the Dominguez Archeological Research Group (DARG), and the project's lead videographer), two rounds occurred early in the project: July 2017 and April 2018. Participation was inconsistent, and process evaluation was suspended. At the close of the project (2022), key History Colorado staff were interviewed (by phone) as a final process evaluation. In all cases, open-ended questions were designed to to prompt and facilitate reflection and used to capture details of concerns and successes that participants experienced.

Findings from the process evaluation supported the following measurable learning outcomes:

Audience 4: Tribal, Museum and STEM Professional Communities
- Better understand successful collaborative models at a strategy for STEM learning (Strand 5).
- Demonstrate increased competence in using and adapting Ute STEM collaborative model tools (Strand 5).
- View collaborations between tribes, museums and scientists as an important part of STEM knowledge creation and learning (Strand 6).
- View history museums as partners in informal STEM learning (Strand 6).

Evaluation Reports:
Ute STEM Process Evaluation 1 Report (July 2017)
Ute STEM Process Evaluation 2 Report (April 2018)
Ute STEM Process Evaluation 3 Report (2022)

Fieldwork Evaluation
Fieldwork evaluation (completed post-fieldwork in 2017 and 2018) was designed to facilitate reflection and enable the Ute STEM project team and fieldwork participants to look back on their fieldwork experiences, assess progress and learning, and document any concerns identified to apply to future fieldwork sessions and/or the Ute STEM project overall. The project's Co-Principal Investigators (Co-PIs), participating project staff from History Colorado, tribal representatives and participants (adults and youth) from the three participating Ute tribes—Southern Ute Indian Tribe,

Ute Mountain Ute Tribe, and Ute Indian Tribe - Uintah and Ouray Reservation, archeologists and other scientists from the Dominguez Archeological Research Group (DARG), and the project's videographers participated in phone interviews and were asked to reflect on their fieldwork experiences. This included 18 interviews in 2017 and 17 interviews in 2018. Additionally, short videos were created to summarize fieldwork evaluation findings.

Findings from the fieldwork evaluation supported the following measurable learning outcomes:

Audience 1: Ute People
Ute participants will:
- Be motivated to learn about traditional Ute approaches to engineering, technology, botany, geography, climate and weather and will be interested in archaeological research methods and tools (Strand 1).
- Understand TEK and archaeology field practices through studying wickiup sites and regional ecology (Strand 2).
- Observe, gather and analyze data to answer questions, and formulate their own research questions and hypotheses to test and explore as part of the research team (Strand 3).
- Reflect on how TEK and archaeology inform one another, and will view Ute science, technology, engineering and math as contemporary STEM practice (Strand 4).
- Participate in scientific activity, use the tools of archaeological surveying and site field work, engage in scientific inquiry, and use STEM findings to inform exhibits and programs (Strand 5).
- Identify as someone who uses and contributes to traditional Ute STEM knowledge, archaeology,engineering, and science (Strand 5).

Audience 4: Tribal, Museum and STEM Professional Communities
Tribal, Museum, and STEM communities will:
- Better understand successful collaborative models at a strategy for STEM learning (Strand 5).
- Demonstrate increased competence in using and adapting Ute STEM collaborative model tools (Strand 5).
- View collaborations between tribes, museums and scientists as an important part of STEM knowledge creation and learning (Strand 6).
- View history museums as partners in informal STEM learning (Strand 6).

Evaluation Reports:
Ute STEM 2017 Fieldwork Evaluation
Ute STEM 2018 Fieldwork Evaluation

Exhibit Evaluation
Exhibit evaluation was conducted at several stages to inform History Colorado Center's "Written on the Land" exhibition and the traveling/portable exhibits. Front-end and topic tested provided baseline information, used to guide exhibition and program planning for "Written on the Land." This included interviews with 114 participants in May 2018. Once "Written on the Land" opened (in early 2019), 66 visitors were observed in the Ute STEM-specific area of the exhibition (i.e., STEM

interactives) and 60 of those were also interviewed. These observations and interviews centered on visitors' perception of the STEM interactive components/exhibits. Additionally, 66 visitors were interviewed after exiting the full exhibition. These interviews focused on: 1) visitors' key take-aways, or "big ideas" within the exhibition, 2) what visitors perceived as the most compelling elements of the exhibition, and 3) If and how the exhibition conveyed the Ute peoples' relationship to the land and to Colorado. Once the traveling/portable STEM exhibits were created and distributed (based on those in "Written on the Land"), additional evaluation was conducted with Red Rocks Community College, who hosted the exhibis at two of their sites.

Findings from the exhibit evaluation supported the following measurable learning outcomes:

Audience 2: Family and Adult STEM learners (including in rural and underserved communities in Colorado and surrounding states)
Museum visitors and public programs attendees will:
- Increase their interest in Ute STEM, Ute culture, and archaeological research methods and tools; they will be curious about STEM connections to their own lives (Strand 1).
- Understand TEK concepts and modern archaeological explanations (Strand 2).
- Test building methods, explore patterns, and observe plants to make sense of the natural and physical world (Strand 3).
- Reflect on how TEK and archaeology inform one another, and will view Ute science, technology, engineering and math as contemporary STEM practice (Strand 4).

Evaluation reports:
Ute STEM 2018 Front End Topic Testing Evaluation
Ute STEM 2018 Interactive Exhibits Prototyping Summary (internal document)
Ute STEM Written on the Land Summative Evaluation
Ute STEM Traveling Exhibit Evaluation Report

History Take-Out Evaluation
History Take-Out evaluation was designed to assess project outcomes related to the project's K–12 education programs. History Take-Out is a kit-based education program designed for preschool through 5th grade students. The Ute STEM-specific kit is called "Ute Knowledge: Colorado's Original Scientists." In this facilitated hands-on program, students use objects, photographs and a large walk-on map of the state to explore the stories of people, places, and industries throughout Colorado's history. History Take-Out is offered as a facilitated program by History Colorado's museum educators 1) at the museum as part of school field trips, or 2) at schools as a visiting program; alternatively, teachers/educators can acquire a History Take-Out kit and facilitate the program themselves (supported by online/virtual training). History Take-Out evaluation consisted of observing lessons facilitated by History Colorado museum educators, online surveys completed by teachers whose classrooms had the History Take-Out program at their schools, online surveys and/or one-on-one interviews with educators (both school teachers and community-based education program providers) who had completed all modules of the virtual training and facilitated the program, online surveys with partners provided with access to

kits and virtual training, and phone interviews with History Colorado staff members who created, expanded, facilitated, and created History Take-Out training.

Findings from the History Take-Out evaluation supported the following measurable learning outcomes:

Audience 3: K-12 Learners and Educators across Colorado and Utah
Outreach program participants and educators will:
- Develop an interest in Ute STEM approaches to engineering, technology, botany, geography, climate, and weather, and will be curious about STEM connections to STEM in their own lives (Strand 1).
- Understand TEK concepts and modern archaeological explanations (Strand 2).
- Explore and generate scientific questions and hypotheses about construction, ecosystems, and patterns (Strand 3).
- Test building methods, explore patterns, and observe plants to make sense of the natural and physical world (Strand 3).
- Reflect on how TEK and archaeology inform one another, and will view Ute science, technology,engineering and math as contemporary STEM practice (Strand 4).

Educator training participants will:
- Be motivated to incorporate Ute STEM knowledge in their classrooms and/or informal science settings (Strand 1).
- Apply Ute STEM content and skills in their classrooms and other settings (Strand 2).
- Explore scientific practices, scientific explanation, and argument in Ute STEM and archaeology that can be used in learning settings (Strand 3).
- Reflect on how TEK and archaeology inform one another and view Ute science, technology, engineering and math as contemporary STEM practice (Strand 4).

Evaluation report:
Ute STEM History Take-Out Evaluation Report

Additional Evaluation Materials

- Ute STEM logic model (with list of measurable outcomes)
- Ute Indian Museum garden video (interviews)