Interdisciplinary Research (IDR) Origination Awards: Cover Page

STEAM Education as a Catalyst for STEM and Artistic Achievement among Native Youth

Principal Investigator(s)

<table>
<thead>
<tr>
<th>Name (PI listed first)</th>
<th>Department</th>
<th>College</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark Graham</td>
<td>Art</td>
<td>Fine Arts and Communications</td>
</tr>
<tr>
<td>Tara Carpenter Estrada</td>
<td>Art</td>
<td>Fine Arts and Communications</td>
</tr>
<tr>
<td>Paul Adams</td>
<td>Design</td>
<td>Fine Arts and Communications</td>
</tr>
<tr>
<td>Michael P. Taylor</td>
<td>English</td>
<td>Humanities</td>
</tr>
<tr>
<td>James Swenson</td>
<td>Comparative Arts and Letters</td>
<td>Humanities</td>
</tr>
<tr>
<td>Steven Shumway</td>
<td>Technology and Engineering</td>
<td>Engineering</td>
</tr>
</tbody>
</table>

Track Two

Abstract

STEAM education is a viable way to integrate the arts into STEM subjects and to create opportunities for interdisciplinary inquiry and collaboration. This project will develop and evaluate STEAM education programs among Native students who are part of the American Indian Services’ (AIS) PREP Program. PREP is an educational preparatory program for Native Americans in which students experience three summers of STEM instruction designed to prepare them for higher education. Our project is designed to create sustainable partnerships between AIS and BYU faculty focused on STEAM education. The aims of the IDR grant are to (1) develop an interdisciplinary research collaboration and AIS partnership that are focused on effective arts integration within the AIS PREP program and (2) develop intercultural competence among pre-service educators, who will be the art integration and arts education instructors for the program.

In order to establish a credible program and gather evidence for our external grant proposals, the IDR grant will fund our pilot study during the summer of 2022, the subsequent evaluation of the project and the expanded iteration of this project in 2023. This initial phase will design and implement STEAM curriculum and assess Native students’ experiences in a sustained investigation of STEM subjects through arts integration. Our goals are to create a model for effective STEAM education programs among Native students and explore how designing and implementing a cross-cultural arts integration program might develop intercultural competence among BYU pre-service teachers. We will also be conducting research on the affordances and limitation of STEAM education among underserved indigenous communities, schools, and students. A key to success of the project is the support of the IDR grant, which will be used to develop sustainable educational, artistic, and research partnerships with Native teachers, scholars, students, and leaders and to fund pilot projects exploring STEAM education.

Summary of Plans for External Funding

We will apply for smaller grants from the National Art Education Foundation and The Indigenous Communities Fellowship Challenge (with our AIS partners), designed to support integration of culturally grounded solutions to Native educational challenges after the first pilot is finished and evaluated. Larger grant proposals include: (1) The NSF Education and Human Resources Core Research/Discovery Research PreK-12 to enhance teaching and learning in STEM subjects by K-12 students through research and educational innovation. (2) NSF Facilitating Research at Primarily Undergraduate Institutions (3) Spencer Foundation Small Research Grants (5) National Endowment for the Arts Transdisciplinary arts research support for innovation and earning (these are often matching grants). These funding agencies support transdisciplinary research, especially in underserved communities with research focused on equity, diversity, and inclusion. The IDR funded pilot studies will provide credible evidence and experience to support our grant proposals. We have existing support from the Art Department for grants that require matching funds.
I. The Need for STEAM Education and Cross-Cultural Education Opportunities

The problem: There is a need for culturally responsive arts integration in STEM programs in Native communities. Our proposed solution is to create interdisciplinary, cross-cultural partnerships in order to develop STEAM education programs for Native community PREP students. This project also creates opportunities for future educators (BYU students) to design culturally responsive curriculum, engage in mentored research, and experience teaching in diverse communities to prepare them to become reflective and competent teachers and researchers.

Culturally responsive teachers can more effectively connect the content of instruction to the interests and lives of their students because they have a deeper understanding of the historical and cultural contexts of their students’ lives. Creating quality, culturally relevant educational opportunities among indigenous youth is a critically important but challenging task because of the existing conditions in many of these communities, which is often exacerbated by their geographical remoteness and cultural marginalization. An essential ingredient in developing intercultural competence is immersive experiential field experience. This project is designed to provide these experiences, create sustainable partnerships with Native communities, and investigate the affordances and limitations of STEAM education. Collaboration. This project brings together an interdisciplinary team of BYU faculty and AIS leaders and educators to develop innovative educational programs, scholarship, and creative work. Effective STEAM education requires collaboration between artists, and educators in art, design, and STEM disciplines.

According to American Indian Services, living conditions on many Indian reservations are comparable to third-world countries. Employment rates, educational attainment, and income are among the lowest in the nation. The American Indian Services (AIS) PREP program is designed to give middle school students enhanced STEM educational opportunities. AIS serves communities throughout the country, but particularly in the Intermountain West. We have developed a partnership with AIS that includes Chauma Jansen, Director of American Indian Services. We have been invited by the AIS Gallup site coordinators to develop an arts integrated program in the Gallup, NM site, which includes students from Navaho, Zuni, and Hopi tribes. The aims of the IDR grant are to create an interdisciplinary research partnership focused on effective arts integration and to develop intercultural competence among BYU pre-service educators. In practice, this will involve creating sustainable models of STEAM education within the existing PREP program. Since BYU pre-service art educators will be the instructors, our second aim is to develop teachers who are able to design responsive curricula and learning experiences for diverse populations of students.

II. Background: STEAM Education, Arts Integration, and Design Thinking

The emphasis on STEM disciplines in many schools has caused advocates for art education to propose the addition of the arts to the study of science, technology, engineering, and mathematics, transforming STEM into STEAM. A STEAM curriculum allows arts educators and their disciplinary counterparts to think about curriculum in a collaborative way in areas where science, technology, engineering, arts, and mathematics intersect.

STEAM education uses the methods of science, technology, engineering, mathematics, and the arts to guide student inquiry and design curricula content. STEAM education is an effective strategy to develop 21-century skills of collaboration, creativity, and communication, and innovation (Allina, 2018; Katz-Buonincontro, 2018; Graham, 2021, 2022; Maeda, 2013; Sousa & Pilecki, 2018; Watson, 2016). STEAM has the potential to immerse students in a diversity of knowledge across the domains of science, technology, engineering, arts, and mathematics with an emphasis on connections between making and learning (Knochel, 2018). Arts integration is a practice of purposefully connecting ideas and skills from the arts with other subjects to open new ways of experiencing, representing, or gaining knowledge (Graham, 2022; Marshall, 2019; Peppler & Wohlwend, 2018).

STEAM education can develop skills and dispositions such as creativity, communication, problem solving, and improved academic engagement. Hybrid disciplinary approaches that include the arts can make learning more dynamic and meaningful by adding new perspectives on knowing. Engaging with the arts can promote the development of social and emotional intelligence including fostering the ability to empathize
with the experiences of others (Allina, 2018; Arts Education Partnership, 2018; Catterrell, 2017; Farrington et al., 2012 Frey et al., 2019; Jacobs, 2010; Horvath & Marshall; Knochel, 2018; Leimbach & Armstrong, 2018; Maddena et al., 2013; Maeda, 2013; Marshall, 2019; Pink, 2006; Pomeroy, 2012), Radziwill et al., 2015; Rollins, 2016; Workman, 2017).

**Design Thinking**

A significant trend in art, design, and engineering education is interdisciplinary collaboration using the construct of design thinking (Cross, 2011; Lahey, 2017). Design thinking is a process emphasizing observation, collaboration, fast learning, visualization of ideas, rapid concept prototyping, testing of prototypes and analysis of outcomes. This is a collaborative strategy for defining problems, devising solutions, building and testing prototypes, and refining solutions (Henriksen, 2017). Design thinking is used in business, education, engineering, and design to develop innovative solutions to complex problems. It can also provide a structure for teachers to develop the creative and interdisciplinary practices associated with STEAM education (Henriksen, 2017; Knochel, 2018).

**Research Studies of Arts-Integration and Current Status of Research**

Research for STEAM education is largely focused on the efficacy of arts integration. In 2017, the American Institutes for Research completed a comprehensive review of evidence-based strategies for arts integration that could qualify for funding under the Every Student Succeeds Act (ESSA). According to this report, 44 studies of arts-integration interventions met the definition of one of the four tiers of evidence under the ESSA Tiers of Evidence provisions (Ludwig et al., 2017). This meta-analysis is significant because in the United States, there has been an emphasis on “evidence-based research” for the funding of educational initiatives such as STEAM education.

Evidence of the effects of arts integration on student outcomes exists at all four ESSA evidence tiers. However, most arts-integration interventions are supported by Tier 4 evidence only (Ludwig, et al., 2017). This suggests that the value of arts integration in STEAM education programs needs additional research. According to a meta-analysis of the research, the average effect found in the 27 well-designed studies examined was statistically significant but modest in magnitude. This analysis noted a correlation between arts involvement and academic achievement and showed positive outcomes in a variety of school-related areas that correlated to involvement in the arts (Catterall, 2017; Sousa & Pilecki, 2018).

**Culturally Responsive Teaching**

A critical challenge for educators is how to teach and include diverse voices within the curriculum. It is a disturbing fact that many students feel left out and lose interest in school, in part, because they feel no connection to their own culture within school (Kraehe & Herman, 2020; Guthrie & Kraehe, 2015). At issue is a vexing challenge that many teachers and pre-service education students face; how to authentically engage with students from cultures that are different from their own background, within schools that often emphasize a Eurocentric curriculum. A key factor linked to student success is having culturally responsive curricula and culturally competent educators (Chalmers, 2002; Gay, 2000).

**Place Based Education**

Developing STEAM education programs for indigenous communities requires designing curricula and teaching that is responsive to students’ culture, community, beliefs, spiritual practices, artistry, and world views. A key theoretical construct for these types of educational programs is critical place-based education, which makes local culture, community, histories, and ecology important parts of the curriculum (Schulte, 2021). Place-based educators emphasize content that has reference to local traditions, communities, and ecosystems (Graham, 2007, 2017; Gruenwald & Smith, 2008). Critical place-based education connects curriculum and teaching to students’ lives by helping students become attentive to the ecology, natural history, and cultural history of the places where they live.

**American Indian Services PREP Program**

American Indian Services is a non-profit public charity whose mission is to provide scholarships and educational programs to Native Americans while ensuring that their cultural values are preserved. We will be working with the American Indian Services Pre-Freshman Program that challenges students in the 7th, 8th, and 9th grades by immersing them in the science, technology, engineering, and math for 6 weeks during the summer. Our project will add to this existing program an equally rigorous immersive experience in the visual arts where art will be integrated with existing STEM curriculum creating a STEAM educational experience. This project supports the aims of the PREP program including helping indigenous youth become
academically successful while at the same time honoring their cultural traditions, experiences, and personal funds of knowledge.

III. Project Goals
1. Create partnerships with teachers, educational leaders, indigenous scholars, and American Indian Services to design and implement STEAM educational programs for PREP students.
2. Explore the educational outcomes of a STEAM arts curriculum for PREP students and educators.
3. Develop strategies and experiences to cultivate intercultural competence among pre-service educators.
4. Create mentored research/experiential learning opportunities for graduate and undergraduate students.

IV. Interdisciplinary Team

<table>
<thead>
<tr>
<th>Collaborator</th>
<th>Background</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mark Graham (PI) Art/Art Education</td>
<td>Dr. Graham is an expert on STEAM education, experiential learning, and arts integration (Estrada &amp; Graham, in press, Graham 2021, 2020). He is an internationally known children’s book illustrator and is experienced working with secondary students and teacher education, including culturally responsive education (Graham, 2022, Graham, 2019).</td>
<td>Supervision collaborative research and teaching, research design, and establishing partnerships with American Indian Services and community partners.</td>
</tr>
<tr>
<td>Tara Carpenter Estrada Art/Art Education</td>
<td>Tara is a ceramic and mixed media artist with established research in arts integration (Carpenter-Estrada &amp; Graham, in press) with expertise in art education student practicum experiences.</td>
<td>Coordinate the design of the arts integration course and train undergraduate pre-service participants.</td>
</tr>
<tr>
<td>Paul Adams Photography</td>
<td>Paul Adams is an internationally known photographer who has worked with indigenous people throughout North America where he documented and interviewed the last native speaker of disappearing languages.</td>
<td>Paul will provide cultural background, photography expertise, and photo documentation.</td>
</tr>
<tr>
<td>James Swenson Art History</td>
<td>James Swenson is an art historian whose expertise is photography, Intermountain history and culture, and indigenous education in the United States. He has done extensive research with the Dine’ people including the history of the arts in the Intermountain Indian School (King, Swenson, &amp; Taylor, 2021).</td>
<td>Provide expertise on indigenous art and schooling, which forms an important background for our both the project and related research.</td>
</tr>
<tr>
<td>Michael Taylor English</td>
<td>Dr. Taylor is co-author with James Swenson of a book documenting indigenous art and the history of art education in the Intermountain Indian School (King, Swenson, &amp; Taylor, 2021). His expertise is in North American indigenous studies, with a focus on building relationships with Indigenous communities, educators, and scholars.</td>
<td>Guide and advise our work on site and with American Indian Services, with whom he has long standing relationships.</td>
</tr>
<tr>
<td>Steve Shumway Technology and Engineering</td>
<td>Dr. Shumway has extensive experience designing K-12 technology and arts integrated projects including successful STEM professional development with local schools and districts including a McKay School of Education collaboration with K-12 educators “The Art of Engineering” which demonstrated the importance of art in engineering and how art can inform engineering design.</td>
<td>Dr. Shumway is the STEM education expert and consultant on the project.</td>
</tr>
</tbody>
</table>

V. Methodology
Research is a site of contestation among indigenous communities given the colonialist history of knowledge and research (Denzin, & Lincoln, 2008; Smith, 2008). A key goal of this project is developing
research partners in the communities we are working with in order to develop methodologies that are sensitive to indigenous knowledge, voices, and experiences. The participation of our partners is critical to the generation of research questions and developing research protocols. Indigenous ontology and epistemology are based on relationships. A fundamental aspect of our research is the premise that knowledge is relational and culturally situated. Relational accountability requires us to form reciprocal and respectful relationships within the community where we are doing research (Wilson, 2008). The challenge in designing the program and its evaluation is to create effective, culturally responsive educational experiences at the intersections of culture, science, and art (Lai, 2013; Prévost, 2013). We will use participant observations, interviews with individuals, focus group discussions and student creative work as sources of data. Student’s creative work showcases their imagination but also what they know and can do with what they know (Penuel, 2022).

VI. Expected Project Outcomes
1. Develop sustainable partnerships with American Indian Services, schools, artists, educators, and researchers in the Gallup, NM location.
2. Design STEAM courses that are appropriately challenging and culturally responsive to middle school indigenous students.
3. Students in the PREP program will develop a range of artistic dispositions and 21st century skills related to their interdisciplinary study.
4. BYU undergraduate students will design culturally appropriate integrated curriculum and develop teaching skills that are culturally responsive to the indigenous students they will be teaching.
5. BYU students will gain understanding of indigenous research methodologies and become acquainted with how research works in school settings through mentored research opportunities.

6. Scholarship and Creative Work Deliverables
a. Using the expertise of the faculty team we will submit 6 external proposals. This will include funding for at least 2 large projects and four or more medium and small projects.
c. Experiential learning. Our pilot studies will include 24 undergraduates and 3 graduate students with additional opportunities for research and experiential learning in subsequent years

VII. Project Timeline and Expected Milestones

<table>
<thead>
<tr>
<th>May 2022</th>
<th>IRB Approval for Pilot Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>March-April 2022</td>
<td>Visit research sites, meet with on-site instructors and leaders to develop research questions and protocols, explore local resources, and arts integration possibilities. PREP students, instructors, and leaders will visit University art studios/museums</td>
</tr>
<tr>
<td>June 15-22</td>
<td>BYU faculty and art education pre-service students will expand literature review, plan and implement STEAM instruction, design research protocols, and gather data.</td>
</tr>
<tr>
<td>June 24-August 10, 2022</td>
<td>Faculty team will evaluate program data in consultation with AIS partners, develop plans for future arts integration programs in 2023 and determine future research needs.</td>
</tr>
<tr>
<td>August to December 2022</td>
<td>Using results from pilot study, apply for NAEF external grants and Indigenous Communities Fellowship Challenge grants.</td>
</tr>
<tr>
<td>August-Nov 2022</td>
<td>Working with AIS partners plan 2023 STEAM projects</td>
</tr>
<tr>
<td>January-May 2023</td>
<td>Implement expanded programs and gather data based on revised research protocols.</td>
</tr>
<tr>
<td>July-August 2023</td>
<td>Apply for external funding from NEA, NSF, and Spencer grants.</td>
</tr>
</tbody>
</table>
Budget

Year 1: Pilot Study (2022)
- Graduate student wages for up to 200 hours. $3,000
- Undergraduate student research wages for up to 400 hours $4,800
- Travel to research sites (April 2022) $1,300
- Hosting and Supplies AIS leaders and students at BYU (June) $300
- Travel to research sites: 12 students 4 faculty (June-July) $1,200
- Accommodations, food for students and faculty (15 days) $6,500
- Art supplies and materials $1,200
- Hosting of partners on research sites (NM) $200
- Local travel to significant art sites near the community $400.

Preparing Grant Applications and Publications (2022)
- Initial editing and formatting to style guide $600
- Copy editing $300.

Total: $20,000

Year 2: Pilot Study Phase 2 (2023, details will be similar to 2022) $18,000

2nd Phase: Preparing Grant Applications and Publications $2,000

Total $20,000

Other funding
- Art Department Experiential Learning Funds
- Art Department Endowment Grants

Budget Narrative
We currently have two graduate students (one Native American) who are prepared to be hired onto the project. We have two undergraduate students prepared to be hired onto the project and a robust cohort of undergraduate students who have committed to being part of the practicum course, which includes enrollment in ArtEd 378, K-12 Classroom Management, 3D Methods, and Community Arts Practicum.

- A significant item on the budget is student wages. We view collaboration with students as a major force-multiplier and way to for students to gain research experience. The graduate students involved are teachers, which gives them additional experience in working with curriculum development and mentoring undergraduate students. Involving students in practicum experiential curriculum design, research, and teaching projects will provide essential learning experiences for students. The PI team has a strong record of successful integration of undergraduate and graduate students in various types of research, art, and professional activity, including research on arts integration and STEAM education.
- Travel to the site prior to beginning the project is essential for developing relationships with the community and educators we will be working with as well as refining research questions and research protocols that are sensitive to important local cultural issues. A significant part of the research and related work must take place on site, in Gallup, New Mexico.
- The site (Gallup, NM) for the pilot was chosen by AIS because of the vibrant local arts community and because of its isolation relative to other sites. Our AIS partners felt that this was one of the more underserved populations within their jurisdiction.
References


Art21. (2019). [Olafur Eliasson](https://art21.org/artist/olafur-eliasson/?gclid=CjwKCAjwxt_TBRAEXiwAENY8hTsXdlSvz2FXlo71NWe12NgOTdV5N4mLpQSiYILdKJyw2GAH58v1UxOCeEQAvD_BwE)


Guthrie, C. & Kraehe, A. M. (2015). Un-disciplined racial subjects in the arts in education: Cultural institutions, personal experiences, and reflexive Interventions. In A. M. Kraehe et al. (Eds.), *The Palgrave handbook of race and the arts in education*, pp. 443-350. [https://doi.org/10.1007/978-3-319-65256-6_20](https://doi.org/10.1007/978-3-319-65256-6_20)


Schulte, A. Connecting to students through place https://pdfs.semanticscholar.org/4292/eff70bf5efe6e82292d05f7e5030f9641497.pdf?ga=2.66648233.605242151.1643235893-1224884569.1643235893


Plans for External Funding

<table>
<thead>
<tr>
<th>Grant Program</th>
<th>Proposal</th>
<th>Amount</th>
<th>Deadline</th>
<th>Lead PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>National Art Education Foundation (NAEF)</td>
<td>Project and Research Support for STEAM arts integration</td>
<td>$21,000 (2 years)</td>
<td>Oct 31, 2023, 2024</td>
<td>Graham</td>
</tr>
<tr>
<td>NSF Education and Human Resources Core Research</td>
<td>Project and Research Support for STEAM arts integration to support STEM education</td>
<td>$400,000</td>
<td>October 2022, 2023</td>
<td>Graham</td>
</tr>
<tr>
<td>Discovery Research K-12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSF Facilitating Research at Primarily Undergraduate Institutions</td>
<td>Research Support for STEAM arts integration and undergraduate research</td>
<td>$300,000</td>
<td>Jan 2022, 2023</td>
<td>Graham, Carpenter-Estrada</td>
</tr>
<tr>
<td>Spencer Foundation Small Research Grants</td>
<td>Research support for education research project for the improvement of education</td>
<td>$50,000</td>
<td>April and Oct 2022, 2023</td>
<td>Graham-Carpenter-Estrada</td>
</tr>
<tr>
<td>The Indigenous Communities Fellowship</td>
<td>Research support for educational innovations in indigenous communities</td>
<td>$10,000</td>
<td>February 2022, 2023</td>
<td>Graham and AIS</td>
</tr>
<tr>
<td>National Endowment for the Arts (NEA)</td>
<td>Transdisciplinary arts research support for innovation/learning</td>
<td>$50,000 (matching)</td>
<td>March 28, 2022, 2023</td>
<td>Graham, Adams</td>
</tr>
</tbody>
</table>

1. **National Art Education Foundation** Grants ($10,500) grants support art education programs and research. The PI for the proposed project is the recipient of two previous NAEF grants. We will apply for NAEF grants in October 2023 and again in October 2024 based on the IDR supported program.

2. **NSF Education and Human Resources Core Research** ($400,000/3-5 years). The ECR program supports research that contributes to the general, explanatory knowledge that underlies STEM education in the research areas of: STEM Learning and Learning Environments and Broadening Participation in STEM fields. The ECR program supports a wide range of fundamental STEM education research activities, aimed at learners of all groups and ages in formal and informal settings. We will apply for $400,000 to support the research project for 3 to 5 years based on the evidence from our EDR pilot studies.

3. **NSF Facilitating Research at Primarily Undergraduate Institutions** ($300,000) provides funding for faculty members at predominantly undergraduate institutions (PUIs). RUI proposals support faculty in research in their professional field(s), builds capacity for research at their home institution, and supports the integration of research and undergraduate education, which is a key element of our project.

4. **Spencer Foundation Small Research Grants**: The Small Research Grants on Education Program supports education research projects that will contribute to the improvement of education, with budgets up to $50,000 for projects ranging from one to five years that span a wide range of topics and disciplines that innovatively investigate questions central to education including STEAM, diversity, equity, and inclusion.

5. **The Indigenous Communities Fellowship** ($10,000) serves to provide Native innovators with the support and resources they need to advance their work designed to support integration of culturally grounded solutions to Native educational challenges. The IDR will provide evidence for these grants.

6. **National Endowment for the Arts** Research Grants in the Arts funds research studies that investigate the value and/or impact of the arts, including Research Lab programs. Matching/cost share grants of $10,000 to $100,000 are awarded. The NEA Research Labs program offers grant funding for longer-term research agendas. This includes multiple research studies and activities that build and inform the field throughout the life of an NEA Research Lab. Each NEA Research Lab will design a transdisciplinary research agenda, conduct project activities to execute that agenda, and prepare and disseminate reports and other products or services that will contribute substantively to a wider understanding of one of three areas of special interest to the NEA. The IDR supported pilot will provide a credible track record and institutional partnership for a Research Lab Grant.
Biographical Sketch 1.

Mark Allen Graham
Professor, Brigham Young University

A. Professional Preparation
New York University, New York, NY Master of Business Administration, 1986.
University of Utah Bachelor of Fine Arts, 1978

B. Professional Appointments
2005-Present  Brigham Young University, Provo, Utah Professor, College of Fine Arts
2002-2004  Washington State University, Pullman, Assistant Professor, College of Education
Art Department Chairman and District Coordinator of Visual Arts

C. Products Most Closely Related to the Proposed Project

Other Significant Products, Whether or Not Related to the Proposed Project


Creative Activities: Illustrated Books

Coloring Book Illustration for RxART, a nonprofit organization whose mission is to help children heal through visual art.

*The Hem of Enlightenment* Graham, M. A. and Goldsberry, C. 2017


*The Fringe of Nirvana* Graham, M. A. & Goldsworthy, C., 2016


*Charlie Anderson*, Margaret McElderry, NY, licensed to Teaching Strategies Inc. primary and pre-school education program, in English and Spanish editions, 2010.


Grants and Awards

Fulbright Specialist Grant: Fulbright Specialist Designation, 2019-2023


La Laycock Grant for Creative Collaboration: Nepal 2020

Laycock Grant for Creative Collaboration: Northern Scotland 2019

CITES Grant, McKay School of Education: A Study of Integrated Arts Learning in Utah Public Schools.

Redd Center for Western Studies Grant: Green River Project 2019-2020

NAEF Foundation Grant 2015-2016: A study of Secondary Design Programs.

Co-Director of Two Field Studies in India and Nepal, 2015-2017: Laycock and BYU Mentoring Grants

Manuel Barkan Memorial Award of the National Art Education Association 2008.
Biographical Sketch 2.

Tara Carpenter Estrada
Assistant Professor, Brigham Young University

A. Professional Preparation
University of Utah, Fine Arts, MFA, 2012

B. Professional Appointments
Assistant Teaching Professor: Brigham Young University Provo, UT, August 2015-Present

Visiting Assistant Professor: Full time 3-year appointment, Brigham Young University Provo, UT August 2012-July 2015

C. Products
   i. Products Most Closely Related to the Proposed Project
   Publications:


Program Director for BYU Jumpst(ART), 2015-present
Coordinate and organize continuing education classes, mentor BYU students as they teach art to K-12 students on campus.

CITES (Center for the Improvement of Teacher Education and Schooling) grant research, 2018-2020 As the PI, with a team that included two other faculty (Mark Graham and Corinna Peterken) and four research assistants, we were funded $20,200 to run a large-scale study of arts integration in the Beverly Taylor Sorenson Arts Program in 5 school districts.

   ii. Other Significant Products, Whether or Not Related to the Proposed Project

   Gallery Exhibitions:
   Gather, Curated regional exhibition that focused on the power of gathering women in conversation, Art Access Gallery, Salt Lake City, UT, April 2019

   Be it Ever So Humble, Curated group exhibition focused on issues of home and family, Utah Cultural Celebration Center, West Valley City, UT, January-March 2017
Finding Balance, Curated small group show focused on balancing the demands placed on women, Art Access Gallery, Salt Lake City, UT, February-March 2015

A Woman's Work is Never Done, Juried National exhibition focused on issues of women/artists, New Port Richey, FL 2007

Selected International and National Juried Conference Presentations
Foundations in Art: Theory and Education Conference, Online 2021, Presentation: A Non-major’s view of Art Classes

Care/Giving, series of four prints and an essay focused on caring for women published in the Journal of the Motherhood Initiative (a peer-reviewed scholarly journal), Volume 11, Number 1, July 2020

Presentations:
An Artist and A Mother, Faith and Works Lecture, Brigham Young University, February 2017 As part of this project, I worked with film students to video interview several artists/mothers about their experiences. The lecture and interviews are available publicly on YouTube.

InSEA World Congress, Vancouver, CA 2019
Presentation: Art vs. Craft: A False Dichotomy

National Art Education Association Convention, Seattle, WA 2018
Presentation: The Challenges and Possibilities of Student teaching: WhatMakes Great Student Teachers and Mentors

National Art Education Association Convention, New York, NY 2017
Presentation: Many Schools, Many Stories: Insights from Classrooms in Nepal and India

National Council on Education for the Ceramic Arts, Portland, OR 2017
Presentation: Concept in the Classroom

Publications

Selected International and National Juried Exhibitions
Catharsis, Juried International Exhibition, Online Exhibition hosted by the Teaching Artist Podcast, February 2021
Shear Madness, Juried Collage Exhibition, Northville Art House, MI, January 2021
Adorned, Juried National Exhibition, Clay Center of New Orleans, LA, September 2019
Twin Cups: National Ceramics Exhibition, Juried national exhibition, Missouri Western State University Clay Guild, St. Joseph, MO, February 2019
Amuse Yeux, Juried national exhibition, Foothills Art Center, Golden, CO, June-August 2018
NAEA (National Art Education Association) Exhibition, Juried group exhibition, NAEA Studio and Gallery, Alexandra, VA, October 2017-April 2018
Fire and Earth, Juried national group exhibition, Del Ray Artisans Gallery, Alexandra, VA, Sept.-October 2016

D. Synergistic activities
Arts Education Policy Review Board, Visual Art Representative, 2020-Present
InSEA(International Society for Education through the Arts) Conference proposal reviewer, 2018

UAEA (Utah Art Education Association) Board member, Higher Education Representative, 2018-Present

Co-Director of Two Field Studies in India and Nepal, 2016-2017
Biographical Sketch 3.

James Swenson
Associate Professor, Brigham Young University, Art History

A. Professional Preparation
Ph.D. University of Arizona 2009 History of Photography and Art History
M.A. Brigham Young University 2000 Art History and Curatorial Studies
B.A. Brigham Young University 1998 Art History and Curatorial Studies

B. Professional Appointments
2008 – Present Associate Professor, Art History, Brigham Young University
2007 Visiting Professor, Art History, Brigham Young University
2005-2007 Associate Instructor, Art History, University of Utah
2006, 2008 Adjunct Instructor, Centro Studi Città di Orvieto, Italy
2004-2007 Adjunct Professor, Art History, University of Arizona

C. Products Most Closely Related to the Proposed Project
Scholarly Publications: Books


Book Chapters, Essays, and Articles
Co-editor and introduction to Weaving the Unexpected: Navajo Pictorials from the Lucke Collection, Museum of Art, Brigham Young University, 2015.

“Ragged Places and Rugged Men: Photography, the American West, and Masculine Mettle,” in Across the West and Toward the North: Norwegian and American Landscape Photography, eds. Shannon Egan and Marthe Fjellestad (in press).


Other Significant Products, Whether or Not Related to the Proposed Project
https://journals.openedition.org/transatlantica/10747

Exhibition Catalogs, & Essays

Grants and Awards
2020 Humanities+ Public Humanities Award (for Returning Home Intermountain Project). College of Humanities, Brigham Young University.
Biographical Sketch 4.

Paul Adams
Professor, Brigham Young University

A. Professional Preparation
M.F.A. Photography, Utah State University ’96
B.F.A. Photography, Brigham Young University ’94

B. Professional Appointments
Brigham Young University, Professor. ’03 – present
Tameside College, Ashton-Under-Lyne, England,
Fulbright Exchange Instructor. ’02 -’03
Florida Keys Community College, Assistant Professor. ’97-2003
Utah State University, Adjunct Instructor. ’96-’97

C. Products Most Closely Related to the Proposed Project

International Juried Shows:

2021  LensCulture Portrait Awards 2021 38 Finalist (19 countries and 5 continents).
2021  52nd Dallas Show. The Dallas Society of Visual Communications.
2021  Black and White. BROOKLYN, NY
2021  American Photography 37 AI-AP, American Illustration American Photography
2021  In Conversation With The Land Center For Fine Art Photography Fort Collins, CO
2020  Communication Arts 61st Photography Annual Competition Communication Arts Magazine
2020  Texas Photographic Society 29th Annual International. The Center for Contemporary Arts, Abilene, Texas
2020  Black & White 2020 New York Center For Photographic Arts
2019  Royal Photographic Society International Photo Exhibition RPS House, Bristol England
2019  PCNW 22nd Juried Photography Exhibition Photographic Center Northwest
2018  2018 International Juried Exhibition Center for Photographic Arts
2015  Moscow International Foto Awards FotoLoft Gallery
2013  International Kontinent Awards Izmir, Turkey (Second Place Award for Fine Art Projects).
2012  155th International Print Exhibition 2012 Royal Photographic Society

National Juried Shows
2020  Artist Who Teach 2020 Ellington-White Gallery Fayetteville, NC
2018  American Landscapes Exhibition Maryland Federation of Art Circle Gallery, Annapolis, MD
2015  2015 West of the Mississippi Juried Show Clymer Museum Ellensburg, WA
Grants and Awards

2020  Emmeline B. Wells Grant, Brigham Young University
2016  Charles Redd Center for Western Studies, Research Award
2003  Fulbright Teacher Exchange – England

Publications:

2021  Emergence Magazine
2020  Communication Arts Magazine
2018  PDN Fine Art Photography Issue August
2011  2011 Communication Arts / Photography Annual

Permanent Collections

Chattahoochee Valley Art Museum LaGrange, GA The Illinois Institute of Art Chicago, IL
State of Utah, Utah Arts Council Salt Lake City, UT
Brigham Young University Museum of Art Provo, UT
University of Northern Iowa Cedar Falls, Iowa
Norra Eccles Harrison Museum of Art Logan, UT
Robert Weinreb Tenba Corporation New York, New York
Lamar Dodd Art Center LaGrange, GA
Biographical Sketch 5.

Michael Taylor
Assistant Professor, Brigham Young University

A. Professional Preparation
2012–2016 PhD, English, University of British Columbia
2010–2012 MA, American Studies, Ruprecht-Karls-Universität Heidelberg
2006–2010 BA, English, German Studies, Brigham Young University

B. Professional Appointments
2016–present Assistant Professor, Brigham Young University
2015 Instructor of Record, University of British Columbia, Institute for Gender, Race, Sexuality, and Social Justice

C. Products Most Closely Related to the Proposed Project

Books

2021 Returning Home: Diné Creative Works from the Intermountain Indian School, U of Arizona Press, co-written with Dr. Farina King and Dr. James Swensen, Fall 2021.


Peer-Reviewed Chapters

2019


Grants and Awards
2020 Honorable Mention, American Literature Society’s 1921 Prize, awarded annually for the best article in any field of American literature

2020–2023 Butler Young Scholar Award, Charles Redd Center, Brigham Young U.

2017 American Studies Professor of the Year, Brigham Young University
Interdisciplinary Studies Grant, Charles Redd Center

University
2018–present Associate Director, American Indian Studies, College of Family, Home, & Social Sciences

2017–present Facilitator, BYU Indigenous Studies, Interdisciplinary Learning Group

Community
2019–present Founding Director, Indigenous Initiatives Internship Program

2018–present Volunteer, BYU Native American Alumni Chapter

2017–present Volunteer, Provo City School District and Nebo School District Title VI, American Indian Education
Biographical Sketch 6.

Steven L. Shumway Ph.D.
Professor, Brigham Young University

A. Professional Preparation
Ph.D., Utah State University, Education- Curriculum and Instruction (1999)
M.S., Utah State University, Industrial Technology and Education (1993)
B.S., Brigham Young University, Industrial Education (1987)

B. Professional Appointments
Professor, Brigham Young University (2016 - present): Technology and Engineering Education Program, School of Technology, Fulton College of Engineering and Technology
Associate Professor, Brigham Young University (2006 - 2016): Technology and Engineering Education Program, School of Technology, Fulton College of Engineering and Technology
Assistant Professor, Brigham Young University (1999 - 2006): Technology and Engineering Education Program, School of Technology, Fulton College of Engineering and Technology

C. Products Most Closely Related to the Proposed Project

Scholarly Publications


**K-12 Professional Development Projects**


**Grants and Awards**

2013-2015 (Co-PI). *Advancing Informal STEM Learning Through Alternate Reality Games*: National Science Foundation: Award # 1323787 for a total of $1,250,000. Full-Scale Development: Collaborative Research Advancing Informal STEM Learning Through Scientific Alternate Reality Games (ARG). This is a collaborative NSF grant with the University of Maryland. The University of Maryland grant is for $684,000 with Kari Kraus as PI and the BYU grant Co-PI and the BYU grant is for $1,250,000 with Derek Hansen as PI and Steve Shumway as Co-PI.

2004-2009. (Co-Director of Brigham Young University Site): *National Center for Engineering and Technology Education* (NCETE). The center was funded for $10,000,000 by the National Science Foundation in 2004 under NSF program award 0426421 [http://ncete.org/flash/index.php](http://ncete.org/flash/index.php) The funded research portion of my faculty profile, BYU’s allocation on this grant was approximately $150,000 for 6 years.

**Other Significant Products, Whether or Not Related to the Proposed Project**

Current and Pending Support (for each team member)

1. The Art Department has committed experiential learning funds for undergraduate and graduate students to work on this project. The Art Department has also obtained donor funding for the project. These funds are particularly important as we seek grants that require matching funding.

2. Dr. Graham has a Fulbright Specialist Grant from the US State Department to develop STEAM programs in Nepal. He also has a Laycock Interdisciplinary grant from the College of Fine Arts and Communication to support mentored student research for the Nepal project.

3. Professor Carpenter-Estrada is PI of a track 2 IDR Grant.

4. Professor Taylor is in the 2nd year of a 3-year Butler Young Scholar Award, Charles Redd Center, for study of culture of the Intermountain West.