Innovation Incentive Awards: Entry # 35

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Applications must address each of the following

Project Description

Art and science have not always been such separate disciplines. Prior to photography, refrigeration, and the speed of modern travel, botany and natural history were disciplines that were only as good as the art skills of the scientist themselves. The biological details of a specimen were captured almost entirely by pen, paint and paper. Long before the convenience of art supply stores, artists were also chemists and geologists as they experimented with natural elements and chemical processes to develop different pigments and mediums. However, both groups often get a very similar question, “Where do you get your ideas?” Artists seek to create something original in their work; while scientists seek for the unanswered question to pursue. For both groups of students, new ideas are the hallmark of a success. Do they use the same tools of discovery? I took the discussion to my own research lab, and after some excited brainstorming about the nature of discovery, we realized, we need artists in the Krakos Lab. The main hypothesis of this project is that the process of discovery will have common patterns by both art and science students as they experiment with the invasive honeysuckle plant fibers. Specifically, the research team will consist of a team of art and science students working together on the research and development of a new product as part of the Maryville Honeysuckle project and its ongoing work to manage invasive species with innovative approaches.

Statement of Specific Project Goals

This project has the following goals:

1. Create a collaborative research team of art and science students that will experiment with the physical properties of the invasive honeysuckle plant to develop a material that can be used as an expressive medium for artists.
2. Compare how artists and scientists use notebooks in the development and processing of new ideas.
3. Examine how a cross-discipline environment centered on research impacts student learning.
4. Educate Maryville students and continue community outreach and scientific education about conservation and invasive species with an invasive species art show.

Rationale for pursuing the project, literature reviewed and rationale for funds

Leonardo da Vinci’s notebooks are the quintessential example of interdisciplinary research; they are engineering prototypes, scientific research notes and artist sketchbook, all in one. He combined art and science into one powerful approach to explore his world. In our modern world, the artist and the scientist have become two divided academic disciplines. This project seeks to bring those two disciplines back together to in one research project, anticipating that the integrated approach will prove the most effective. In my development as a professor at Maryville, creating interdisciplinary curriculum has been a focus, as it is of many educators (Pring 1973). And as a research scientist, I have always used research as an extension of teaching. However, I have not yet explored the idea of interdisciplinary research as a teaching tool. In thinking about how to best pursue that concept, there are three key innovative approaches that this grant focuses on. First, to create a single arts and sciences research space where students on the team interact throughout the project. This will be a new learning environment, and one that will promote cross-discipline relationships and collaborations. Second, to analyze how art and science students are using notebooks to process and develop ideas. Both disciplines have a long history of using notebooks, and research has looked at the role of notebooks, logbooks, etc. in student learning (McLeod 2001). This project takes an innovative approach in specifically evaluating the processes of learning in an art vs. a science notebook. Third, the invasive species art show is an unusual event that provides a format for community education about the power of interdisciplinary approaches to real world ecological and conservation issues. Conservation is a perfect area for cross-discipline research, because the care for our
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natural world needs everyone’s effort and insight. This is not just a science issue; it is an “all living things” issue. To that end, both artists and scientists, have a common goal in stewardship of our earth. The money provided for this summer research will be used to provide supplies and equipment for the student team as they develop the sustainable product from honeysuckle. In addition, it will fund the workshop with the local fiber artist, who will initially train our student team on tree harvesting techniques. Finally, these funds will be used for the capstone event, the invasive species art show.

Plan of action and timeline

• Spring 2014: Recruit 5 artists and 5 science students. To date, we have 3 art student recruits and all the science major recruits.
• May 2014: Workshop with Martha Younkin, a local artist who gives workshops on harvesting fibers from cedar trees. The team will apply these techniques with honeysuckle species.
• June 2014: Tour of the rare books collection at Missouri Botanical Garden. These illustrated volumes date back to the 13th century and show how botany as a scientific discipline is firmly rooted in the quality of the art that illustrated the plants.
• June-July 2014: Student development and research of fiber preparation and techniques. Students will keep notebooks regarding their work.
• Aug 2014: Prepared raw fiber material, and a summary of information discovered will be made available to the Fiber Class that Maryville has in the fall semester.
• Sept 2014 Student research presented at Undergraduate Research Symposium.
• Nov 2014: Invasive Honeysuckle Art Show. This will have a monetary prize and will be open to any student. It will be judged by the Maryville Art Faculty and a judge from the Contemporary Art Museum of St. Louis. This event will be open to the general public.
• Jan 2015: Presentation of project at the Faculty Development Day.
• July 2015: National Botanical Conferences. The student research team will travel to the national science conference and present a poster on their research. I will present a talk on my results from the project.

Plan for assessment of project impact

This project takes place on two levels, the students’ outcomes of the research they are doing, and my study of how they conduct the research. To assess the student project success, they will keep detailed lab notebooks and produce a poster to present their research at a conference. In addition, I will have their notebooks include a weekly reflective journal over the course of the summer research. We will have a specific meeting at the end of the summer research to discuss their experience of being part of an integrated art and science lab. We will discuss their perspective on the strengths and challenges of such an approach to research. This discussion and the student notebooks will serve as a main source of data for my own comparative research on the impact of this integrated discipline approach to student learning. To answer the questions regarding the role of the notebook in how a student processes new ideas, I will develop a rubric and compare any patterns between the art and the science students. I will also keep a reflective journal over the course of the project, with a focus on the team dynamics and learning patterns, and collaborative behaviors I observe.

Potential of project to enhance your teaching practice and student learning

Artists might call them sketchbooks, and scientists call them field journals, but they are the same idea. The notebook is a place for immediate capture of thought or data, as well as a place to process new ideas in unscheduled moments. The parallels between art and science will be examined further to gain a deeper understanding how new ideas are developed by students. This provides valuable insight for educators on guiding students towards accessing their deeper creativity and innovative ideas. The second key piece of this project that will most impact the teaching and learning is creating a research environment with both art and science students working in the same physical space. Usually, even if another discipline has some input, science research is done in a science lab, and art research is done in a studio setting. These are both spaces in which students explore and test new ideas, but this project will no longer define those as two different locations. The students and I will be working in the research lab on all aspects of the project. This format is to facilitate not only this project, but to hopefully inspire a new and continued learning environment. When students are working side by side on a daily basis, they form
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relationships that lead to future collaborations. My hope is that this collaborative framework will become the way students approach their future questions. A desired outcome is that the Krakos Lab will never again have "only" science majors.

Discuss how your project may be applicable to enhancing teaching practices and student learning across Maryville and beyond

The Honeysuckle project, with its innovative and multi-faceted approach to managing invasive species, has always been broadly participated in across Maryville campus. This newest development which brings together art and science disciplines into a new collaborative research space to work with the honeysuckle fibers, will be open to students of any discipline who wish to participate. I expect that the interest that has been generated to date will continue to grow and the Honeysuckle Project will continue as a student driven project.

Beyond the Maryville campus, the Honeysuckle Project as part of the Office of Sustainability and Green Maryville, continues to expand the educational outreach to the community, especially with Goat Week, our annual event held in the spring. The Invasive Species Art Show will be a community and campus advertized event. The Maryville media group will be filming a series of short videos documenting the art and science research team throughout the project, which will be featured on the Maryville website. Additionally, presentations on this research will be given at both local and national conferences. These will include presentations by the students and their results, as well as presentations on my research on the student learning outcomes of the project.