

*How the Arts and Humanities Can Assist the APLU Agenda for Public Impact-Focused Research (or PIR)*

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Several years ago, in an article entitled, *Perfecting Cross-Pollination*, Lee Fleming reported in the Harvard Business Review about the value of creative teams from disparate and diverse disciplines. In studying more than 17,000 patents, he learned that while teams made of up people from closely allied fields produced many more patents, the unusually high-value, innovative breakthroughs came from teams made of people from very diverse disciplines.<sup>1</sup>

My goal to day is to encourage all of you to make some leaps across boundaries and incentivize interactions between the arts and humanities and scientific researchers. There is a natural affinity for these collaborations in the increasing emphasis on public impact-focused research and creative activity.

The key ideas I wish to share include: 1) that arts and design disciplines can help explode the research questions; 2) that the approach of practice-based arts research can inform and engage scientific research; and 3) that collaboration can help all of us address the increasing need to define, measure and reward the *impact* of research and creative activity. It's easiest to discuss these key ideas through the three different hats I'm wearing today.

**1) The most obvious hat** is that as a dean of arts and design disciplines at a large research university. I have spent much of my 40-years in higher education at public land-grants trying to help scientists, engineers, and social scientists expand their understanding of research to include the arts. Too often, arts are considered as useful mechanisms of communications, (particularly in visualizing data) or even sometimes in translating data. However, I keep hammering away at the notion that if the science researchers will bring artists and designers to the table at the beginning they will find that these creatives will explode the questions and the research wide open and lead in new directions and discoveries.

The notion of leaps across boundaries that include creatives in research seems evident in some of the language that occurs in the NSF's 10 Big Ideas to support in future research, particularly in the goals for Convergence Research and for NSF 2026. The Convergence Research challenge speaks to the need for "framing challenging research questions at inception, and fostering the collaborations needed for successful inquiry." In line with Fleming's research, the NSF website further notes in this category that our grand challenges will not be solved by one discipline alone. They require the merging of ideas, approaches and technologies from widely diverse field of knowledge to stimulate innovation and discovery. Therefore, "convergence builds and supports creative partnerships and the creative thinking needed to address complex problems." Similarly, NSF 2026 "intends to transcend established scientific structures and standard operating procedures." Programs in this category "could cross boundaries in innovative ways, fill recognized gaps or take advantage of new opportunities."<sup>2</sup>

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<sup>1</sup> Lee Fleming, "Perfecting Cross-Pollination," *Harvard Business Review*, September 1, 2004

<sup>2</sup> [https://www.nsf.gov/news/special\\_reports/big\\_ideas/](https://www.nsf.gov/news/special_reports/big_ideas/)

A Penn State example of working outside the usual boxes of disciplinary boundaries is music professor Mark Ballora, who works with sonification of data. Mark's work demonstrates how the engagement of aural senses can lead to different discoveries in science research. He started through a project with Mickey Hart, a drummer with the Grateful Dead who was working with a cosmologist at Lawrence Berkeley Labs on a film, *Rhythms of the Universe*. Mark contributed several examples including one on cosmic microwave background radiation. Mark has begun working with meteorologist and climate scientists to help explore oceans, storms, hurricane, and CO<sup>2</sup> levels. And he is a real boundary breaker, having spent a sabbatical working in the College of Information Science and Technology at Penn State and participating in several NSF grants.<sup>3</sup>

Another example is a successful competition for building habitats on Mars by an interdisciplinary team at Penn State. Architects working on solving material problems for buildings became PI's for a NASA project exploring ways to build structures on Mars. Their task was to work with materials on earth that were most similar to elements that would exist on Mars and figure out a way to build a building from that material, knowing that a space ship couldn't transport a building there, but could transport a robot arm to "print" a building using existing materials. Working with engineers and material scientists, over the past three years, they developed materials and were among one of two teams (and the only university team) successful at building a habitat to scale for the most recent round of competition in May, 2019.

**2) Another hat I'm wearing** is as one of the founding members of a2ru – the Alliance for the Arts in Research Universities. A2ru is a partnership of more than 40 research universities committed to connecting knowledge and empowering leadership to foster interdisciplinary collaboration. A2ru envisions works in which universities—students, faculty, and leaders—acknowledge, embed, and integrate the arts in pursuit of basic knowledge and everyday practice.<sup>4</sup>

When several of us were discussing how to build on an exciting workshop around arts integration after a convening at the University of Michigan in 2011, we wanted to make sure we didn't create another association – we weren't interested in putting another dot on the map. Instead, we wanted to connect the dots, among institutions, among higher ed associations, among research and curricula that would benefit by breaking through disciplinary boundaries and encouraging a wider range of interactions.

A2ru has made considerable progress on its goal of connecting the dots. They worked with the National Academies of Science, Engineering, and Medicine on a report about the importance of arts and humanities as part of all science curricula. There have been two national convenings at NAS in Washington, D.C. in 2018 and 2019 and now many universities are holding town halls to discuss ways to implement recommendations from the report released in 2018.<sup>5</sup>

**3) One final hat**, I'm wearing today, is as a participating dean in the Big 10 Arts Administrators consortium. I have agreed to provide editorial leadership for preparing a white paper for the February 2020 meeting of that group that addresses concerns with which the APLU is wrestling in its recent report

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<sup>3</sup> <https://demo.ipostersessions.com/default.aspx?s=78-0C-80-7B-2A-4F-1B-68-69-38-1E-99-CB-FB-E2-FC>. For a video about Prof. Ballora and sonification see, <http://wpsu.psu.edu/digital/scitech-now/sonification/>

<sup>4</sup> <https://www.a2ru.org/>

<sup>5</sup> David Skorton and Ashley Bear, ed. *The Integration of the Humanities and Arts with Sciences, Engineering, and Medicine in Higher Education: Branches from the Same Tree*. The National Academies Press, Washington, D.C., 2018.

on Public Impact-Focused Research: how do we measure, recognize, and reward the impact of public practice-based arts research and/or measure, recognize and reward the impact of inter- or trans-disciplinary research that involves the arts. When I reviewed the June 12 draft of the APLU Report, I was struck that the list of barriers and challenges you list, in many cases, match exactly the tasks the Big 10 arts deans have taken on.

Though it seems that none of the groups working to address the questions around public impact-focused research have found the answers yet, there is hope that working across our boundaries we may arrive at new answers that will help artists, humanists, and scientists who desire to have an impact and need to have that recognized in meaningful ways in our institutions.

Artists understand and can tell the story of impact, yet we struggle to find ways to describe impacts in a way that will increase their value in an academic setting and we recognize that we may learn from science colleagues how we might approach some metrics, although they will likely be very different ones.

Let me end with an example that may better illustrate the task that lies before us and encourage you as research vice provosts, vice presidents, deans to consider how you can foster mutual understandings that may benefit us all.

On one side of a divide, we have a dance professor. That person develops a workshop for inner city youth in Philadelphia. In that workshop there's a ten-year-old kid who lives in great poverty; drug addictions, older siblings involved in gangs, and he seems to have no hope. However, that kid goes to that workshop, and suddenly being able to move in space and understanding the expression his body is capable of, he gains a new level of confidence, physically, that then begins to transfer to cognitive skills he didn't even know he had. That kid gets surrounded by a group of people, by a supportive community of artists who know the value of what they do and over time, that child is able to break that cycle. He gets through high school. He goes to college. And maybe he becomes a dancer, but it's just as likely he's going to be a doctor, or a lawyer, or an engineer or a teacher – a career that's going to touch a lot of lives. And he's going to help bring hope to his own family.

Artists understand that impact, we see it happen, we know it happens, though it's so hard to have others recognize it because we can only tell it through a story. Sometime, unless an adult lets us know about the impact the dance workshop had on him, we may never know the result.

On the other end of the divide is a biomedical researcher who publishes an article that gets cited hundreds of times and leads to new drug discoveries that will save many lives. Both of these have important impacts, yet it is the biomedical one that counts most because it's more easily quantified.

What about finding our way to the middle of these two extremes? Does the arts practice impact have something to say to the biomedical researcher and vice versa? Can each help the other better understand the value of impact in different ways? Can that impact then be translated into policy and practice in our institutions?

I am more hopeful than I have been in my four decades of working in higher education. More of us are building bridges between arts and sciences and there are increasing numbers of faculty and administrators who are understanding the value each brings to the table.

Yet the more we do together, the more time we allow artists and engineers, designers and scientists to intermingle, to spend time learning on another's language and way of seeing the world, the more exciting results we will realize.

I hope you, as research administrators, will leave here today committed to “Just do it!” And the “it” is encouraging more interaction at the outset of a research project among artists and scientists so together they can explore questions, explore a wider range of solutions, engage others in developing, using, and promoting those solutions, and convincing our constituents and stakeholders in the academic research areas of the value and impact of what we are all doing in the public space.