

A 21st-Century Pedagogical Plan for Artists: How Should We Be Training Artists for Today?

Today's challenge in arts education is how to educate artists more effectively to become vital participants in interdisciplinary collaboration. Although the National Science Foundation supports interdisciplinary collaborative research projects, one of the most difficult problems to solve is communication and comprehension between people who essentially speak different languages. Artists can be educated to create meta-languages that bridge the gaps between the meanings and terminologies of different knowledge domains. Donna Cox is an excellent example of an artist who has successfully moved into the area of scientific and information visualization. To begin with, artists must be educated in the information arts: visualization, sonification and musification (mapping data into organized sound using musical structures such as chords or melodies). This kind of data mapping comes under a broader category: perceptualization.

Artists are not strangers to mapping either structure and form, or analogy and meaning, onto other domains. In the late 1960s Dick Higgins defined intermedia as the fully integrated combination of two or more different media into one medium [1]. In other words, intermedia is concerned with structure. Artists have intuitive skills in creating meta-languages, utilizing metaphors that are comprehended by multiple domains. No matter the medium, artists regularly employ the mapping mechanisms of metaphor. In fact, metaphoric mapping is an inherent part of the creative process, both historically and contemporarily. Contemporary metaphor theory has emphasized meaning through analogy; however, artists from all cultures have been engaged in this activity since art-making began. Metaphors are mapping systems.

Artists have been engaging in what is termed art/science for more than 20 years. Still, in dealing with true scientific problems, they often are met with disbelief in their "seriousness" on the part of scientific critics. Some works produced for art/science exhibitions have indeed been little more than superficial uses of images from scientific research. On the other end of the spectrum, some artists have become so involved with scientific procedure that they have become true researchers who collaborate with scientists.

I believe that if we train art students in the same classrooms with science and technology students, a mutual respect will

become part of all parties' belief systems. Artists can bring important skills and thinking systems to the mix, occupying an essential place in the growing area of data mapping. An extra benefit is that students trained across disciplines no longer need to develop skills in a separate field for a day job that will support them.

At the University of New Mexico's Interdisciplinary Film and Digital Media (IFDM) program [2], initiated under Governor Bill Richardson's Media Industries Strategy Plan, we are collaborating on creating and teaching classes for students of scientific, engineering and art practices to learn how to work together with people from very different disciplines. The classes are taught as research laboratories, with both teachers and students contributing to the existing body of knowledge. Students are taught to find keywords and thoughts in one domain and cross-reference them to correlating concepts in other domains.

We are writing grant proposals to the National Science Foundation's Science, Technology, Engineering, and Mathematics program (STEM) for funding to help develop undergraduate curricula, including money for immersive high-resolution screens for visualization development. We are engaged in a research project that will enable the development of a new pedagogical structure.

In the IFDM program, art students are being taught about mapping different kinds of data into visual, sound and haptic media and how to think about meanings that cross over boundaries of different domains. Arts students work with science and engineering students in a collaborative learning structure, and the most important lessons are in the development of methods of collaboration with people from different disciplines.

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References and Notes

1. Dick Higgins, "Intermedia," with an appendix by Hannah Higgins, *Leonardo* 34, No. 1, 49-54, 2001.
2. Andrea Polli, the outgoing chair of Leonardo Education Forum, is the director of the IDFM program.