

# The Art of Science Learning, Incubators for Innovation

The S.T.E.M. Project to Watch in 2014!

Laura Berlin

**What happens when you put 100 people from diverse backgrounds and different age groups together on Saturdays to work on solving S.T.E.M. (Science, Technology, Engineering and Math) related civic challenges? If you teach them arts-based learning strategies and allow them to find and follow their enthusiasm, you get amazing innovation!**

This is exactly what is happening within the “Art of Science Learning” project developed by musician and scientist Harvey Seifter. This is a multi-million dollar project funded by the National Science Foundation. It involves three major U.S. cities, San Diego, Chicago, and Worcester, Massachusetts to test the theory that the Arts; music, theatre, dance, and visual arts, foster innovation, collaboration, communication and better understanding of complex math and science concepts.

Phase 1 of the project was carried out in the spring of 2012. “Building Communities of Practice” convened more than 400 scientists, artists, educators, researchers, business leaders and policy makers at the Smithsonian Institute, Illinois Institute of Technology, and Calit2 at UCSD in San Diego. These groups collaborated to explore connections among arts-based learning and scientific innovation. Their findings were applied to the development and organization of Phase 2 of the project, “Incubators for Innovation”. This phase began in the fall of 2012 by building public awareness of the project, then soliciting public input and selecting participants.



Fig. 1 - Harvey Seifter listens to John Szakcas explain metaphorming.

Now selected, Incubator participants in all three cities will carry out a yearlong collaborative endeavor. Important outcomes will be a national arts-based curriculum for science and math, documented research on how integrating the arts into S.T.E.M. education and practices influences innovation, and the development of new products, services and educational programs. The project will study, specifically, the effect of integrating arts-based learning strategies such as ideation, improvisation and ensemble thinking with science, to create solutions to difficult civic challenges. The three collaborating cities have set up operation centers or “Incubators for Innovation” in major cultural institutions and have selected challenges that were actually voted on by the citizens of each city. The San Diego center is the Balboa Park Cultural Partnership and its challenge is “Water, the mismatch between supply and demand”. San Diego was the first to launch its Innovation Incubator this past October 12<sup>th</sup>. Chicago was next and launched on January 11<sup>th</sup>. The Chicago Museum of Science and Industry is Chicago’s host and its challenge is “Urban Nutrition”. Worcester will begin its program in April using the “EcoTarium”, the city’s Science and Nature Center, as its base. Its challenge is “Alternative Transportation”.

San Diego’s 100 participants submitted applications last June, 2013, and were chosen by the end of the summer, becoming “Incubator for Innovation” Fellows. Gathered from people currently living and

working in the San Diego and Tijuana regions, The San Diego Incubator is composed of people with a wide variety of interests, backgrounds, ethnicities and expertise. There are scientists, engineers, artists, teachers, computer programmers, mathematicians, administrators, business people, community activists, authors and outdoor enthusiasts. There are high school students, college students, working and retired professionals. There are people from all over the world and, also, San Diego natives. There is one thing, however, that each of the Innovation Fellows has in common. That thing is Passion! They all have great passion and commitment for what they do and for making San Diego and our world a better place. The Innovation Fellows do not get paid. They are volunteering their efforts and time in the interest of science, art, learning and our futures in this changing world!

Since October, led by founder Harvey Seifter and San Diego director, Nan Renner, San Diego “Fellows” have been meeting on Saturdays, learning together and working together. They have gone through training by national and local expert faculty in visual and performing arts-based strategies. They have been practicing the application of these strategies to S.T.E.M. related learning and “practice” civic challenges. Some Incubator members, doubtful, at first, of the value of this process, were told to “suspend their judgment”, be open-minded and give this arts-based process a chance. And so they have. In doing so, they have learned to use sculpture and “metaphorming”, jazz music, chamber music and ensembles, movement, dance and choreography, improvisational and experimental theater, narration, storytelling and poetry, surrealism, observational drawing, illustration, collage, muraling and photography.....all to better understand complex concepts, processes and express and communicate ideas!

Now, three months later, almost all skeptics have been quieted. There is incredible collaboration and innovation happening! Now, Innovation Incubator Fellows are ready to apply what they have learned to San Diego’s



*Fig. 2 – Sculpture making to express concepts and processes.*

Civic Challenge, “The mismatch of our water supply and demand”. The group has already identified many opportunities for innovative products, services, and educational programs to address this dilemma. They will narrow these down to the 10 ideas that have the greatest potential for success and impact on the problem. The ideas developed must involve S.T.E.M. disciplines and be truly new and innovative. The fellows will divide themselves into 10 groups to work on these solutions, based on their own interests. Each group will be given mentors and experts that will, in the coming months, support them in the design, development, and marketing, business planning and testing of their ideas. By October, 2014, many of these innovations will be launched to market!

This National “Incubators for Innovation” project will attempt to document what a growing number of people already suspect; that the Arts are accelerators of learning and innovation. This notion is starting to be taken seriously. The January 5<sup>th</sup>, 2014, *San Diego Union-Tribune* newspaper named Nan Renner, San



Diego's Innovation Incubator Director, as one of San Diego's "People to Watch" in 2014!

In the article, Renner who is an artist and scientist with a "cognitive science" doctorate from UCSD, explains, "when you get people engaged in doing and making and interacting with each other and the world, that opens up a wider range of possibilities in terms of creativity and learning." She continues, "It's going to take more than one 'Art of Science Learning' project, but this project, in building the evidence base that the arts make a difference, could have a big impact in education and where we choose to invest our money in education, and what we think about creative collaboration."

The project directors have incorporated public events in to the meeting schedules of the Incubators for Innovation. On December 14, interested San Diegans joined San Diego Incubator Fellows in a field study, mapping and measuring at a variety of locations along the San Diego Pueblo Watershed.

On January 25, the public is also invited to join the San Diego Incubator in learning about "The World of Water – Ecosystem, Infrastructure, and Innovations" from experts in the field. This will take place at The San Diego Natural History Museum from 10 :00 am – 2:00 pm. For free admission to this event:



Fig. 3 - Field measurements along Pueblo watershed.

### [Register to WATER: In Search of Solutions.](#)

<https://docs.google.com/a/bpcp.org/forms/d/13LmrP-pHLz-hkIDYHRZExsOdVHeBEEXxj9Sq-MgyfE/viewform>

During March through September there will be multiple public prototype galleries and showcases. Finally, on October 20, 2014 there will be a "Water Innovation Demo" open to the public to introduce and display "Incubator" developed innovations that have made it to "market launch". More specific information about dates, locations, times and content of these public events can be gained by contacting The Art of Science Learning project at [www.info@artofsciencelearning.org](mailto:www.info@artofsciencelearning.org) or The Balboa Park Cultural Partnership at [www.bpcp.org](http://www.bpcp.org) , (619) 232-7502 ext. 1210.

Nan Renner is the Director of San Diego Incubator for Innovation.

Amanda Sincavage is the San Diego Incubator Administrator.

Aly Evans is the National Project Manager.

Harvey Seifter is the Founder, Principal Investigator and National Project Director

**Do the Arts really have the power to foster greater understanding, collaboration, communication and innovation? Do music, theatre, dance, and visual art really have value in science, technology, engineering and math learning?**

**Continue to follow and watch, the “Art of Science Learning” Incubators for Innovation project and you are sure to find out!**

Personal Note:

I became interested in the “Art of Science Learning” project in the Spring of 2012 when I learned about it at a “STEM Education Economics and Equity” seminar in San Diego. I became personally involved after I became a fellow this October. So far it has been an amazing experience - if not life changing, certainly life enriching.

### **About the Author**



Laura Berlin is a visual arts teacher and department head at Clairemont High School in San Diego. She holds Single Subject Teaching Credentials in Visual Art and English and a Master’s Degree in Technology and Learning. Her current interest is in the “Art of Science Learning” project.