CURRICULUM IN THE CRACKS:
ENCOURAGING CROSS-DISICPLINARY AND
ART-SCIENCE-HUMANITIES TEACHING

Panel Discussion
Topic Area: In Between the Cracks

Moderator: Roger Malina, Executive Editor Leonardo and Professor, School of Arts, Technology and Emerging Communication (ATEC) at the University of Texas at Dallas (UTD)

Panelist #1t (in person): Kathryn Evans, Senior Lecturer in Music, UTD School of Arts an Humanities; Project lead, CDASH

Pnaelist #2 (n person): Haytham Nawar,Assistant Professor and Director of the Graphic Design program, Department of the Arts at the American University in Cairo, and director of the Cairotronica

Panelist #3 (in person or via Skype): Cassini Nazir, Clnical Associate Professor in ATEC, Director of Design and Research, ArtSciLab, University of Texas at Dallas

Invitations have been extended to the following members of the Cloud Curriculum Working Group (some members may appear through SKYPE). Potential participants are members of the "Cloud Curriculum Working Group"

Faculty:	Eun Ah Lee, University of Texas at Dallas
	Paul Thomas, University of New South Wales
	Robert Root-Bernstein, University of Michigan
	Annick Bureaud, OLATS
	Lucinda Presley, Innovation Collaborative liaison
	Meredith Tromble, San Francisco Art Institute
	Julia Buntaine, Rutgers University, EIC of SciArt Center & Magazine
	Jane Prophet, Goldsmiths, University of London
	Laurie Baefsky, A2RU

Graduate students:	Jaoa Silveira, Universidade Federal do Rio de Janeiro, Brazil
	Alex Garcia-Topete, UTD
	Yvan Tina, UTD and University of Aix-Marseille
	Sharath Chandra, UTD

KEYWORDS
Art-science, curriculum, assessment, transdisciplinary, cloud, collaboration

INTRODUCTION

The CDASH (Curriculum Development in the Arts, Sciences and Humanities) website was established in 2012 by Kathryn Evans and Roger Malina as a both a resource for faculty who engaged in or were interested in engaging in art-science-humanities curriculum; and as a data collection point where these types of curriculum could be surveyed for innovation and sustainability. The site currently contains over 150 courses from all over the world. The results were analyzed in 2014 and published in LEA (Leonardo Electronic Abstracts).   The CDASH website re-launched in the Fall of 2016 at cdash.atec.io/ with several new features that will facilitate contributions and the analysis of cross-disciplinary curriculum. The new site has created a Cloud Curriculum of syllabi and assessment tools and a Cloud Curriculum Working Group to contribute, analyze and develop these areas.

The impact of cross-disciplinary curriculum on student learning and creativity has not been studied in depth. This kind of curriculum often lives "in the cracks", between traditional disciplines and departments. This panel will discuss the following questions:

1. Are students who have taken cross-disciplinary art-science-humanities courses more accepting or interested or explorative of areas outside their majors? Are they more innovative? Can they think "outside the box'? Can they become members of the "creative class"?
2. How do you design assessment of these kinds of courses that gives equal weight to both (or many) disciplines? How can the current theories in the science of learning help create meaningful evaluation procedures?
3. Are there differences in collaborative art-science-humanities teaching and learning in different countries and educational systems?
4. What are the challenges that cross-disciplinary curriculum faces in the current educational environment?
5. What factors lead to sustainability and success of such courses and programs?
6. How can institutions of higher learning encourage art-science collaborations in both teaching and research?
7. How is art-science education structured in primary/secondary institutions and in informal education?

The Cloud Curriculum Working Group will begin discussing these issues and others at the formal launch of the CDASH website cdash.atec.io in early 2018. These issues will be discussed in advance of the panel discussion at ISEA in June of 2018 through a collaborative mechanism on the website. In addition, new data from the CDASH website will be presented, including courses of interest, level of collaboration, departments offering the courses and evidence of sustainability.

ABSTRACTS

Moderator: Transdisciplinary education navigating the tree of knowledge
In common parlance, scholars often talk about the 'tree of knowledge', a metaphor that is reflected in the way that institutions (such as universities, funding agencies, and assessment units) structure their organizations. Art-science-humanities education that seeks to bridge usefully between different disciplines often runs into many obstacles, both intellectual and institutional. In a tree of knowledge metaphor, the branches grow apart and don't reconnect. In addition art-science-humanities education draws on disciplinary, interdisciplinary, multidisciplinary and transdisciplinary methodologies; as a result it is often not useful to talk of 'best practices' that standardize methodologies, but rather of 'good practices that enable non-disciplinary approaches.

The CDASH cloud curriculum seeks to map the various pedagogical approaches being used by educators internationally, but also to help make the community of practice visible to itself. As an astrophysicist teaching in a school of art and technology, I have been labelled unqualified to teach in this area as I don't have a degree in art or in technology. Through the CDASH cloud curriculum project we hope to develop approaches in education that fit into an ecology of knowledge incompatible with institutions in a tree structure.

Panelist #2
The impact of cross-disciplinary curriculum on student learning and creativity in a global environment has not been studied in depth. The efficacy of a cloud curriculum for international cooperation in higher education, particularly between the West and Asia, will be discussed. A new Call for Curriculum will be issued in early 2018 to expand our knowledge base of collaborative learning environments in the arts, sciences and humanities. Preliminary results will be offered as well as implications for future policies and practice.

An additional concern is assessment and evaluation of these kinds of courses. Higher education has long been departmental in nature. However, in the 21st century, investigators are finding that there are often tools, information, resources and even points of view from other disciplines that can elucidate and even answer the problem they are studying. The introduction of cross-disciplinary course will go a long way to training our students in more creative and innovative thinking, but these courses also need to be assessed in such a way that both disciplines are valued. The integration of the arts into STEM, and the current STEM to STEAM movement, should be viewed more often as a "two-way street". Courses that blend arts and science and humanities should do so with a mutual and equal understanding of the benefits to both areas. The new CDASH 2.0 Curriculum Cloud will allow us to better understand the nature of these kinds of courses and if; in fact, mutual understanding between disciplines is taking place.

Panelist #2:

Establishing a cross-disciplinary learning environment in higher education systems, may face various challenges relating to one's culture and embedded personal opinions regarding one's learning experience, both as an educator and learner. Since education is a lifelong process based on exploration, one can argue that such process cannot be neatly tailored, or evenly distributed. However, one of the challenges of undertaking a boundary crossing approach lies in the extent to which educators from distinct backgrounds are willing to cooperate together. Departments are often comprised of educators, advisors, and professors all working towards the same goal, each carrying a baggage of knowledge that stems from the same branch. An interdisciplinary system would require educators to step out of their comfort zone, and create a personalized outline based on the exchange of diverse ideas. Similarly, another challenge would be the extent to which students are willing to acquire knowledge from different disciplines. Students who are defensive of their own ideas and learning expectations tend to block any potential exposure to different thoughts and hence creative solutions through merging different scopes of knowledge are not fostered. An economically stable environment, with a culture that encourages communication and interaction becomes a strict necessity when setting a cross disciplinary curriculum in order to bridge the methodologies, epistemologies, and practices of different disciplines and reach a mutual collaborative understanding.

Although often thought of as standing at the opposite ends of the spectrum, sciences and arts have always been statements of social change and two of the most powerful means of expression through which arguments are developed and minds are changed. Hence, I believe academic institutions should play an essential role to tap into the potential of combining both, outreaching the different members of a community (students, artists, and researchers) by encouraging partnerships and co-sponsorships with major art and design festivals. Consequently, spreading the necessary knowledge concerning the merge of art and science and encouraging individuals to utilize it as a tool for problem solving, social change, and most importantly, a tool through which they can acquire valuable transdisciplinary skills. A personal attempt at building on the aforementioned realization, would be founding the Cairotronica: Symposium of Electronic and New Media arts in Cairo in 2016. The event came into being, with the sole aim of spreading New Media Arts in Egypt and the Arab World, utilizing it as a tool through which artists can face existing social/cultural/political challenges, encouraging freedom of expression. The program included activities, exhibitions, talks, workshops and screenings by local, regional, and international artists as well as academics, and technology experts. The event served as an active learning environment where students, artists, and an entire audience came together to explore and understand the link between technology and art.

Panelist #3:

As the lead for the redesign of the CDASH website, I will address how we approached the conception of the CDASH digital platform in order to provide meaningful collaboration and opportunities for contributions, and how the field of information architecture informed the design of such a system. This will further our research into the best models for creation of an international working group process and how best to use the CDASH platform as a testing bed for such systems.

BIOGRAPHIES

Roger F. Malina is a space scientist and astronomer, with a specialty in extreme and ultraviolet astronomy, space instrumentation, and optics. He served as director of the Observatoire Astronomique de Marseille Provence and was NASA Principal Investigator for the Extreme Ultraviolet Satellite project at the University of California, Berkeley. He is also a publisher and editor in the new emerging research fields that connect the sciences and engineering to the arts, design, and humanities. Since 1982, he has served as Executive Editor of the Leonardo Publications at MIT Press. He founded and serves on the board of two nonprofits, ISAST in San Francisco and OLATS in Paris, which advocate and document the work of artists involved in contemporary science and technology. He is currently a Distinguished Professor of Art and Technology and Professor of Physics, at the University of Texas at Dallas and Directeur de Recherche for the CNRS in France. He founded the ArtSciLab in the ATEC program fall 2013.

Kathryn Evans, Ph.D., is a singer, conductor, director, producer, and researcher in arts and science. Dr. Evans was the Associate Dean for the Arts of the School of Arts and Humanities at The University of Texas at Dallas from 1995 to 2010. Dr. Evans holds M. A. degrees in Mathematics and in Music and a Ph.D. in Art and Technology, with an emphasis on arts education in the 21st century. She is a member of the Art-Sci Lab in the School of Arts,

Technology and Emerging Communication, under the direction of Dr. Roger Malina, conducting research in music and science education. Her doctoral dissertation " Does musical study enhance academic skills in undergraduate non-music majors?" studied skills transfer for music study to academic skills in STEM subjects. Her current project CDASH (Curriculum Development in Arts, Science, and Humanities) explores the current state of cross-disciplinary curriculum at the college and high school level. She is currently developing curriculum for a music and science minor at UT Dallas, including her course "Music, Science and Technology" which will serve as the core course for the minor.

Haytham Nawar is an artist, designer, and researcher who currently lives and works in Cairo. He is Assistant Professor and Director of the Graphic Design program, Department of the Arts at the American University in Cairo. He is the founder and director of the Cairotronica, Cairo Electronic, and New Media Arts Festival. Nawar received his Ph.D. from the Planetary Collegium, Center for Advanced Inquiry in Integrative Arts, School of Art and Media – University of Plymouth. He holds a Masters of Advanced Studies ZFH in Spatial Design, Institute of Design & Technology, Zurich University of the Arts, Switzerland and an MFA in New Media and BFA in Printmaking from the Faculty of Fine Arts, Cairo, Egypt. He is a Fulbright alumni. Since 1999, he has participated in several international exhibitions, biennales, and triennials, the latest of which was Venice Biennial in 2015. Nawar won awards and acquisitions nationally and internationally in Algeria, Bosnia and Herzegovina, China, Cyprus, Egypt, France, Greece, Germany, Italy, Japan, Lithuania, Portugal, Kuwait, Spain, South Africa, South Korea, Switzerland, Syria, UAE and the United States.

Cassini Nazir is a Clinical Associate Professor in the School of Arts, Technology, and Emerging Communication at The University of Texas at Dallas where he teaches classes in interaction design. He is also Director of Design and Research for the ArtSciLab, a transdisciplinary research lab helping the arts, science, and technology communities by pursuing initiatives of societal urgency and cultural timeliness. His interests include interaction design, user interface and user experience. Over the past 20 years, Cassini has designed print pieces, logos, websites, and interactive elements for mobile, tablet and desktop devices. Cassini holds an MFA from UT Dallas' Arts and Technology Program and bachelor's degrees in English literature and Economics.

ACKNOWLEDGEMENTS