

March 2013

## Towards a “Cloud Curriculum” in Art and Science?

Roger Malina

*University of Texas at Dallas, Texas, USA*

Follow this and additional works at: <https://scholarship.claremont.edu/steam>



Part of the [Aerospace Engineering Commons](#), [Arts and Humanities Commons](#), [Business Commons](#), [Curriculum and Instruction Commons](#), [Life Sciences Commons](#), [Physical Sciences and Mathematics Commons](#), and the [Social and Behavioral Sciences Commons](#)

---

### Recommended Citation

Malina, Roger (2013) "Towards a “Cloud Curriculum” in Art and Science?," *The STEAM Journal*: Vol. 1: Iss. 1, Article 11. DOI: 10.5642/steam.201301.11

Available at: <https://scholarship.claremont.edu/steam/vol1/iss1/11>

© March 2013 by the author(s). This open access article is distributed under a Creative Commons Attribution-NonCommercial-NoDerivatives License.

STEAM is a bi-annual journal published by the Claremont Colleges Library | ISSN 2327-2074 | <http://scholarship.claremont.edu/steam>

---

## Towards a “Cloud Curriculum” in Art and Science?

### Abstract

Recently an email hit my desk from Paul Thomas in Australia with a proposal to work together on a “Cloud Curriculum for Art and Science”. I immediately agreed to collaborate. I don’t yet have a clue of what a cloud curriculum is, but what I do know is that we are ‘backing into the future’ in educational institutions and we desperately need a ‘cloud curriculum.’ We need to look over the ten year horizon. And in the emerging art-science field I doubt that the usual approach to curriculum development will work.

### Keywords

STEM, STEAM, Cloud Curriculum, Internet, Publishing, Engineering, Education, Industry, Design

### Creative Commons License



This work is licensed under a [Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 License](https://creativecommons.org/licenses/by-nc-nd/3.0/).

## **Towards a “Cloud Curriculum” in Art and Science?**

By Roger F Malina

Recently an email hit my desk from Paul Thomas in Australia with a proposal to work together on a “Cloud Curriculum for Art and Science”. I immediately agreed to collaborate. I don’t yet have a clue of what a cloud curriculum is, but what I do know is that we are ‘backing into the future’ in educational institutions and we desperately need a ‘cloud curriculum.’ We need to look over the ten year horizon. And in the emerging art-science field I doubt that the usual approach to curriculum development will work.

I recently took a new position at the University of Texas at Dallas (UT Dallas) with the goal of setting up an “art-science 2.0” or maybe even “3.0” program. As part of this we have set up a Leonardo Initiatives office in partnership with the Leonardo Organizations in San Francisco and Paris. One of the projects is an Experimental Publishing and Curating program in collaboration with the faculty of the Emerging Media and Communications (EMAC) at UT Dallas. My guess is that ten years from now we will look back at the current new publishing platforms as the medieval ages of e-publishing. I am willing to bet that e-books will have disappeared.

I am interested in developing “technologies of attention” so that the material we need to do and what we are doing rises to the top of the data flood and the stuff that is less immediately relevant sinks to the bottom, in a time and interest dependent way. How do we mobilize data when we need it, cloaking temporarily the data we don’t need but uncloaking it when we do? What would a ‘stock market of ideas’ look like? We are exploring ways that the Leonardo Publications can evolve from traditional peer review to collaborative filtering and how to further blur the boundary between documenting work and showing it to others, hence the coupling of publishing to curating. And as part of this we are rethinking the relationship

between the university and local civic institutions, whether they are museums, hospitals, or the hacker communities.

In their report “Learning institutions in the Digital Age” Cathy Davidson and David Goldberg I think correctly called for a rethinking of the whole “pathway’ of higher education and how formal institutions of higher learning play their role in the new digital age (Davidson & Goldberg, 2009). In my graduate seminars here at UT Dallas, I am confronted with students with ‘hybrid’ pathways that they need to navigate between arts and humanities and science and engineering (Malina, 2011). A geosciences student and a genetics student are confronted with similar technical problems in scientific visualization as students in arts and humanities. Artists and scientists face similar problems in data mobilization and data cloaking. Computer simulation is used in fields of science and in fields of art and entertainment. There are many other areas that are emerging and producing new kinds of bridges between the university disciplines.

I have often argued that inter-disciplinarity is not a discipline, that the observational scientist and the experimental scientist are as different in their approaches to knowledge as the performing artist and the visual artist are in their ways of being. But are there shared epistemological tools? We share the use of the computer; how much does this entrain within the diverse practices? At UT Dallas I have been intrigued by the work of the Center for Translation Studies. Experts in this field have been moving from text and literary translation, to cultural translation to inter-media translation. I am interested in trans-disciplinary approaches that allow us to mobilize shared tools, methodologies, and technologies. At the Gissen Graduate Center for the Study of Culture (Giessen, n.d.) this is a topic and we are exploring how trans-disciplinary approaches to art-science inter-disciplinary translation could be deployed.

This gets me back to the Cloud Curriculum in Art and Science. An interesting development in the last two years has been the “STEM TO STEAM” movement to integrate the arts and design with science engineering and mathematics. This discussion has been reinforced by a series of workshops organized by the U.S. National Science Foundation with the U.S. National Endowment for the Arts. John Maeda, President of the Rhode Island School of Design instigated compelling testimony to the U.S. Congress (STEMtoSTEAM.org, n.d.) articulating three types of arguments. First is the “creativity and innovation argument” that good ideas often come from friction or exploration at the boundaries of disciplines. Second, the ‘jobs of the future’ argument; that no government predicted the explosive growth of the game industries and social media industries, but many of the concepts came out of the arts and humanities community, and the cultural sector.

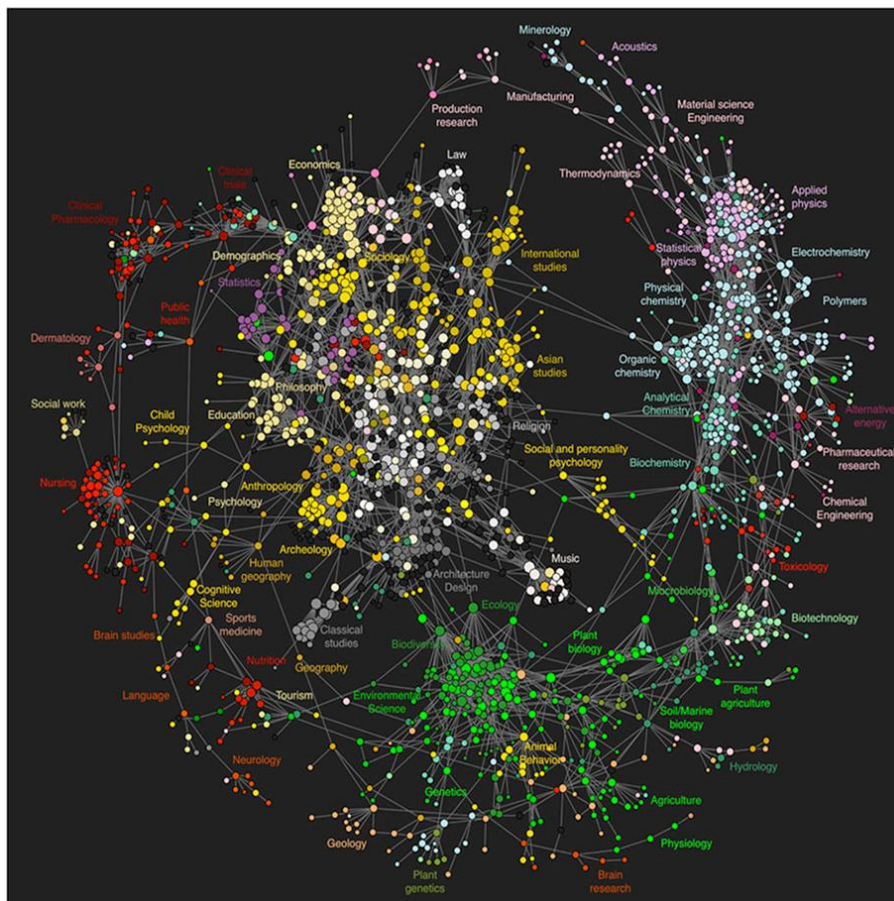
How do we put accelerators into this process? I have been calling this a problem of ‘translational humanities’ in comparison to the current emphasis on ‘translational medicine’ that accelerates the introduction of the fruits of medical research into actual medical practice. The third argument is the ‘social and cultural innovation argument’. Most inventions are never socially adopted often for no good reason than the lack of design of the cultural appropriation process. We live in ‘silos’ even in this networked age (that often reinforces like-minded connectivity rather than divergent thinking). In the innovation industry there are now ‘accelerators’ that act as transitional spaces between the R and D and business incubator environment (Healthbox, n.d.).

Recognizing the new emerging communities of practice, the U.S. National Science Foundation has let a grant to a team led by Carol Lafayette at Texas A and M to establish a network for science and engineering, arts and design (NSEAD, n.d.) We have issued an international call for white papers from the community seeking to identify obstacles and new opportunities that enable deeper collaborations (SEAD White Papers, n.d.) between the

sciences and engineering with the arts, design and humanities. One of the White Papers, led by Kathryn Evan (Evans, n.d.) is inventorying art-science curricula. There is a bewildering variety of content and approaches; it seems doubtful that a ‘standard’ curriculum will develop and that within a networked culture we need to rethink curriculum development.

So what would an “Art Science Cloud Curriculum” be in the face of networked culture? In traditional innovation theory we have a linear process from fundamental research, to applied research to commercialization (and the jobs of the future). But as emphasized by innovation theorists, the situation today is much more complex, with social and non-institutional actors playing growing important roles (including NGO, QUANGO and the hacker, maker and DIY communities (SEAD White Papers, n.d.).

We are in a transition between the hierarchical ‘tree of knowledge’ that governed disciplinary development over the last several hundred years to a ‘networked knowledge’ situation as described by Goldberg (2010)



**Figure Network Representation of Areas of Knowledge.  
Reproduced from D Goldberg (12) Copyright D Goldberg**

Open publishing is evolving at a more rapid rate than traditional academic publishing which surely within ten years will become irrelevant. Somehow the “Art-Science Cloud Curriculum” needs to respond to the new realities of the evolving organization of research and knowledge and also our civic spaces. It may be that universities are mal-adapted to evolve to the new situation; the whole ‘pipeline’ diploma structure (BSc, MA, MFA, PhD) was designed for a world that no longer exists. Even the new distance learning and on-line institutions such as the Khan Academy are a premature response that will be overtaken by new systems. Can universities adapt fast enough? If a student really wants access to the best education that addresses the STEAM vision, that allows for multiple educational ‘pathways’ through science, engineering, arts and humanities, maybe we need a ‘serious game’ environment that summons at the appropriate time, the best teacher or mentor on the planet for the problem at hand, that mobilizes collective group learning technologies of massive collaborative games, that matches budget to the best educational opportunities, that optimizes ‘blended learning’ approaches to combine face to face time, on line collaboration time and access to distant learning resources.

I congratulate the team that has founded this new STEAM journal and hope we can think out of the box together to avoid backing into the future.

**Dr. Roger Malina** is a physicist, astronomer, and has been the editor-in-chief of Leonardo magazine at MIT Press since 1982, including the Leonardo Book Series and Journals. Leonardo was created by his father, Frank Malina, who was a kinetic artist and rocket scientist. Dr. Roger Malina also serves as Chairman Emeritus of the Board of Leonardo, The International Society for the Arts, Sciences and Technology in San Francisco, and President of the Observatoire Leonardo des Arts et Technosciences in Paris. He is a member of the International Academy of Astronautics and a founding member of their Commission VI on Space Activities and Society. He writes on the relationship between the arts, sciences and technology. Dr. Roger Malina is the Distinguished Professor of Arts and Technology and Professor of Physics at University of Texas at Dallas. He is also a Directeur de Recherche of the C.N.R.S. at the Laboratoire d'Astrophysique de Marseille.

## References

- Center for Translation Studies (n.d.). University of Texas, Dallas. Retrieved from <http://translation.utdallas.edu/>
- Davidson, C. N.; Goldberg, D. T.; & Jones, Z. M. (2009). *The future of learning institutions in a digital age*. Cambridge, MA: MIT Press. Retrieved from <http://mitpress.mit.edu/catalog/item/default.asp?ttype=2&tid=11841>
- Emerging Media and Communications (EMAC). University of Texas. Retrieved from <http://www.utdallas.edu/emac/>
- Evans, K. (n.d.). Breaking down the silos: Curriculum development as a tool for crossing disciplines in the arts, sciences and humanities. Retrieved from <http://www.utdallas.edu/atec/>
- Giessen (n.d.) International Center for the Study of Culture. Justus Lieberg University. Giessen. Retrieved from [http://gcsc.uni-giessen.de/wps/pgn/home/GCSC\\_eng/](http://gcsc.uni-giessen.de/wps/pgn/home/GCSC_eng/)
- Goldberg, D. T. (2010). 20xx.EDU: Grand challenges in education. Paper presented at SIGGRAPH (37<sup>th</sup> International Conference and Exhibition on Computer Graphics and Interactive Techniques).
- Healthbox (n.d.). Retrieved from <http://www.healthboxaccelerator.com/>
- Malina, R. F. (2011). Special topics in the arts, sciences, and humanities at UT Dallas. Retrieved from <http://malina.diatrope.com/2011/10/16/special-topics-in-the-arts-sciences-and-technologies-at-ut-dallas/>
- NSEAD (n.d.) National Science, Engineering, Art, & Design. Retrieved from <http://sead.viz.tamu.edu/>
- SEAD White Papers (n.d.). Retrieved from <http://seadnetwork.wordpress.com/>
- STEMtoSTEAM.org (n.d.). Retrieved from <http://stemtosteam.org/>
- University of Texas, Dallas – Arts & Technology Retrieved from [www.utdallas.edu/atec](http://www.utdallas.edu/atec)