

**MAS.714J Fall 2009**

Final Project Proposal

Y. Debbie Liu

**QUESTION**

How can technology be used to enhance students' 21st century scientific thinking skills?

**MOTIVATION**

Using the materials learned in this class, I would like to reframe the educational implications of my findings from an earlier study (Liu & Grotzer, 2009), which identified emerging patterns of scientific thinking in the 21st century—namely, systems thinking, mechanistic (engineering) thinking, interdisciplinary thinking, quantitative thinking, and distributed thinking. The advancement of technology has been the biggest driving force in changing the way scientists think in the 21st century, and it seems only appropriate to look at how technology can advance science learning, focusing on the five particular thinking skills.

**DESIGN**

I would like to limit my scope to a couple of educational technologies, one being Scratch (the other unknown yet...recommendations?), and investigate closely how these technologies can be used by science teacher's to help students think and work with complex systems, work across disciplines (e.g. math, design), and to think outside the individual mind.

**SCENARIO**

I would like to also provide an example of a lesson plan to help illustrate exactly what this looks like.

**FUTURE DIRECTIONS**

I hope to incorporate this work into a paper that will be presented at the National Association of Research In Science Teaching (NARST) 2010 Annual International Conference. Additionally, more lesson plans can be created to help provide teachers with the materials and knowledge they need to bring educational technology into the classroom.

**WORKS CITED**

Liu, Y. D., & Grotzer, T. A. (2009). "Looking Forward: Teaching the Nature of Science of Today and Tomorrow." In I. M. Saleh, & M. S. Khine (Eds.), *Fostering Scientific Habits of Mind: Pedagogical Knowledge and Best Practices in Science Education*. Sense Publishers. pp. 9-36.

MIT OpenCourseWare  
<http://ocw.mit.edu>

MAS.714J / STS.445J Technologies for Creative Learning  
Fall 2009

For information about citing these materials or our Terms of Use, visit: <http://ocw.mit.edu/terms>.