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Exploring the connections between spatial thinking and “design” is of particular interest at the University of Redlands as we are actively engaged in curricular activities in both areas. *LEarNing Spatially (LENS)* is our campus-wide initiative that promotes spatial literacy as a foundational component within an undergraduate liberal arts setting. This is the outcome of 10+ years of Redlands’ dedication to spatially-related curriculum, research, and programs. *LENS* connects the integrative power of geography with a range of geospatial technologies to visualize knowledge, solve problems, and understand relationships through a spatial lens.

This year we have been challenging ourselves to treat spatial thinking as a subject of its own. The National Research Council’s *Learning to Think Spatially* report repeatedly states that all spatial thinking must be “domain specific,” that it cannot be taught out of context. Yet it should be noted that such suppositions come from scientists who have never attempted to do so and lack any particular motivation to try, or they are referring to the challenges of transferring one type of spatial skill (mental rotation) between domains. In fact, having spatial thinking be the explicit focus of a course creates opportunities for numerous contexts, in so far as thinking *in*, *with*, and *about* space are part of our everyday lives. Moreover, while the value of spatial thinking is explicitly recognized within several disciplines (engineering, architecture, mathematics, physics, geology, others), the subject within which spatial thinking is most closely aligned—geography—has paid relatively little attention to this cognitive mode or approach.

This semester (Fall 2008), I offered an introductory “spatial thinking” class as a First Year Seminar (FYS). Ideas for this emerged from a Summer 2008 Symposium—held at the University of Redlands and co-organized with colleagues from UCSB—during which we brought together academics interested in this notion of an explicit curriculum for spatial thinking. The group recognized important challenges: that no consensus exists about core spatial concepts, despite several enumerations having been suggested, and that the vocabulary itself is problematic. With few exceptions these core concepts are simple English words (location, distance, pattern, etc.), yet each is so loaded with disciplinary connotations that in practice one must carefully unpack the terms to reach a place of common ground.

The notion of common ground among researchers and educators is represented in a sketch that I created for the class (Figure 1). This diagram has multiple uses, but its initial objective was singular: to help students navigate the domain of “spatial thinking” concepts. As a teaching tool, the diagram allowed us to focus on spatial principles exclusively and explicitly. This could be considered “out of context” teaching, and I found that once students were comfortable with the concepts in an extra-contextual sense, they launched

themselves back into multiple contexts. We discussed the distances (both geographic and idealistic) that affected the candidates for the presidential election, the patterns of water usage in the West, the experience of proxemics in a newly-shared dorm room, and the spatial strategies that a successful soccer player undertakes. We categorized spatial games, made note of spatially-influenced language, and generated multiple, differently-mapped representations of locations.

For a first-time FYS with a primary goal to “Expand your awareness about the role of spatial thinking in your life and the world around you,” we can claim success, but many questions remain and others have surfaced. What kind of differences does a single class make? Should we track these 17 students throughout their college careers to see if any of this knowledge is transferred to their majors, or to their post-college life in other ways? How would we begin to know? If any of these students were now to study GIS or GIScience in depth, would they answer questions or solve problems differently? Because they studied the spatial concepts of distance decay and diffusion, would it occur to them to try to measure the effects somehow? Might they seek out a tool that buffers? Furthermore, in what other ways can we have students exposed to the ideas from this class? Should there be a role for this in our general education curricula and what would it look like?

In addition to the spatially-based curriculum that we are providing at Redlands, we are starting to explore how concepts of “design” could play a different but related role in a liberal arts and sciences curriculum. We know we do not have the type of academic infrastructure that one might typically associate with “Design”—architecture, engineering, planning—nor do we have intentions of beginning those programs as they are traditionally understood. Instead we are focusing on a broader interpretation of “design,” connecting it with liberal arts foundations of psychology, philosophy, art, and perhaps geography. If the best schools focusing on design are graduate ones, what would make the best type of undergraduate preparation? Liberal arts students are expected to **read critically, write critically, and think critically**. The graphicacy component of our *LENS* curricula adds **view critically**. Now, if “Design is the thought process comprising the creation of an entity” (Bill Miller, 2004), could we design a curriculum that leads students to **create responsibly**? For example, how can we best prepare our students to create sustainable communities? Would it involve exposure to spatial thinking and spatial concepts? What role can we count on GIS to play?

