What is a Spatial University

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In the past couple of years considerable interest has emerged about universities that foster a comprehensive approach to spatial teaching, research, services and infrastructure. For example, entities such as The Center for Spatial Studies at UC Santa Barbara, U Spatial at the University of Minnesota and NSF sponsored Spatial Intelligence and Learning Center headquartered at Temple University have received considerable media attention. This interest suggests that it is possible and desirable to define and identify a Spatial University. The objective of this presentation is to serve as a launching pad for a discussion about the appropriate criteria, methods of measurement, categorization and selection process for Spatial Universities. It advocates that such a designation would highlight exemplary universities that have successfully developed comprehensive programs that foster spatial approaches across a campus. From a public relations standpoint, Spatial Universities would serve as models that demonstrate the value to society for embracing a spatial perspective. Ideally, this designation would foster replication, encourage innovation and provide examples of best practices. The first step toward reaching a definition is the acceptance of criteria and metrics. To this end, the following dimensions are offered as a starting point for reaching a consensus:

1. Spatial thinking across the curriculum.
2. Geospatial workforce development.
3. Geographically oriented collaborative research.
4. GIS applications for campus administration and logistics

It is argued that elements of each of these dimensions should exist at a Spatial University with extensive integration occurring among many groups across the campus. Ideally, faculty and students should be working alongside staff and administrators using the campus and community as laboratories for novel, as well as, practical spatial applications and procedures. In the current computing environment this should include smart systems that use smart phones and other sensors to generate a real time pulse of the campus. Common activities existing at Spatial Universities could include (possible metrics):

- the maintenance of spatial inventories of a wide range of facilities and landscape features
- GIS based planning and logistical support
- innovative research projects using students as subjects in experiments
- internships that help prepare students for the workplace
- data base creation
- development of modeling and analytical procedures that enhance programs such as campus safety and access for disabled students
• creation of informative online maps and visualizations that support navigation

Measures of success or the quality of the programs could include:

• operational administrative decision support systems
• utilization of online systems that improve wayfinding, movement, safety
• student placement measures
• smart systems that enhance the quality of life on campus
• creative teaching modules that incorporate spatial reasoning
• evidence of collaboration and sharing such as joint research proposals
• scholarly publications, presentations and even master’s theses

It is also assumed that successful Spatial Universities are enabled by enlightened administrators and a proactive support staff. Therefore, it is valuable to identify successful organizational structures, funding mechanisms, computing infrastructures, incentives and technical support programs that promote synergism at Spatial Universities. As noted in the NRC report Learning to Think Spatially:

If we are to teach how to think spatially, then we need to provide both low- and high-tech support systems for practicing and performing spatial thinking significant individual and group differences in levels of performance.

The same report provides a useful list of functions that a support system for thinking would provide:

1. Database construction and management: provides a capacity for data acquisition, entry, formatting, storage, and management (the functional equivalent of long-term memory)
2. Data analysis: performs operations and functions for data manipulation, analysis, interpretation, representation, and evaluation
3. Memory: provides working memory for tracking the flow of computations and the storage of working and final results (the functional equivalent of short-term memory)
4. Assistance: provides prompts, feedback, hints, and suggestions to guide the choice of data analysis steps and to manage the flow of work
5. Display: provides a flexible display system for the representation of working and final results to oneself and to others—in physical form (e.g., a graph on paper, a three-dimensional model of molecular structure) or in virtual form (e.g., on-screen, for hard-copy printing, for export to other software packages)

If a consensus can be reached that a Spatial Universities can be clearly defined and identified then it is important to establish a process that will add prestige to those universities that are selected. Such as discussion should focus on:

• What is the full range of dimensions?
• What are the appropriate metrics?
• What is a minimum set of criteria?
• What group should select?
• How should spatial universities be recognized?
• How should they be publicized?
• What is the proper role of associations such as the AAG, ASPRS, CaGIS and UCGIS?
• What is the proper role of commercial organizations?
• How can this become a global initiative?