

Do sustainability projects make sustainable schools?

Integrating K-12 campuses in communities to create sustainable schools

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What is a sustainable school?

Theoretically...

In a sustainable school, students, teachers, administrators, and staff are guided by these principles which are derived from sustainability science (Kates et al., 2001).

- 1. Interconnectedness:** View the world as interconnected and human systems as a component of and dependent on ecological systems;
- 2. Multiple Perspectives in Decision Making:** Acknowledge trade-offs, incorporate multiple perspectives, and build consensus;
- 3. Problem Solving for Well-Being:** Engage in problem-solving that improves student, school, community, and global well-being;
- 4. Change Agents:** Assume an active role as sustainability change agents.

So, to be sustainable, a school must be integrated into its community to allow students to develop solutions to problems across scales.

We, at the NSF-GK12 sponsored Sustainability Science for Sustainable Schools Program at Arizona State University, devised the Sustainable Schools framework to put theory into action and provide a structure to create sustainable schools. We propose that sustainable K-12 schools must implement sustainability projects that cross scales and disciplines, as seen in the framework. It consists of three layers: (1) the sustainability foundation; (2) the focus and scope of participation; and (3) the learning approach.

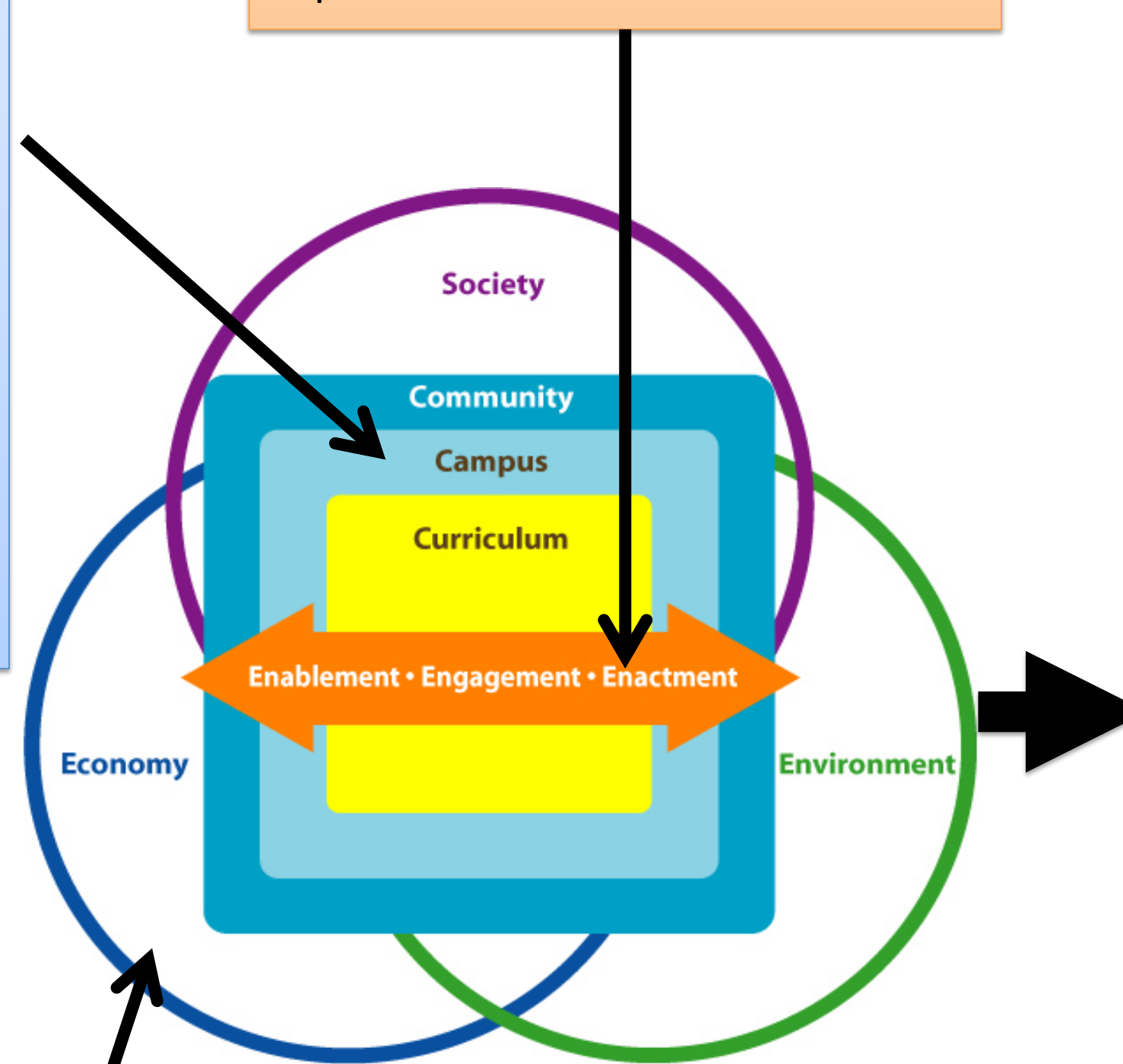
The Action E's
The "Action E's" are an organizing principle by which learning objectives are achieved through a balanced use of cognitive, psychomotor and affective domains.

- Engagement ('Head'):** Academic study and analysis
- Enablement ('Heart'):** Values and attitudes
- Enactment ('Hands'):** Project and system implementation

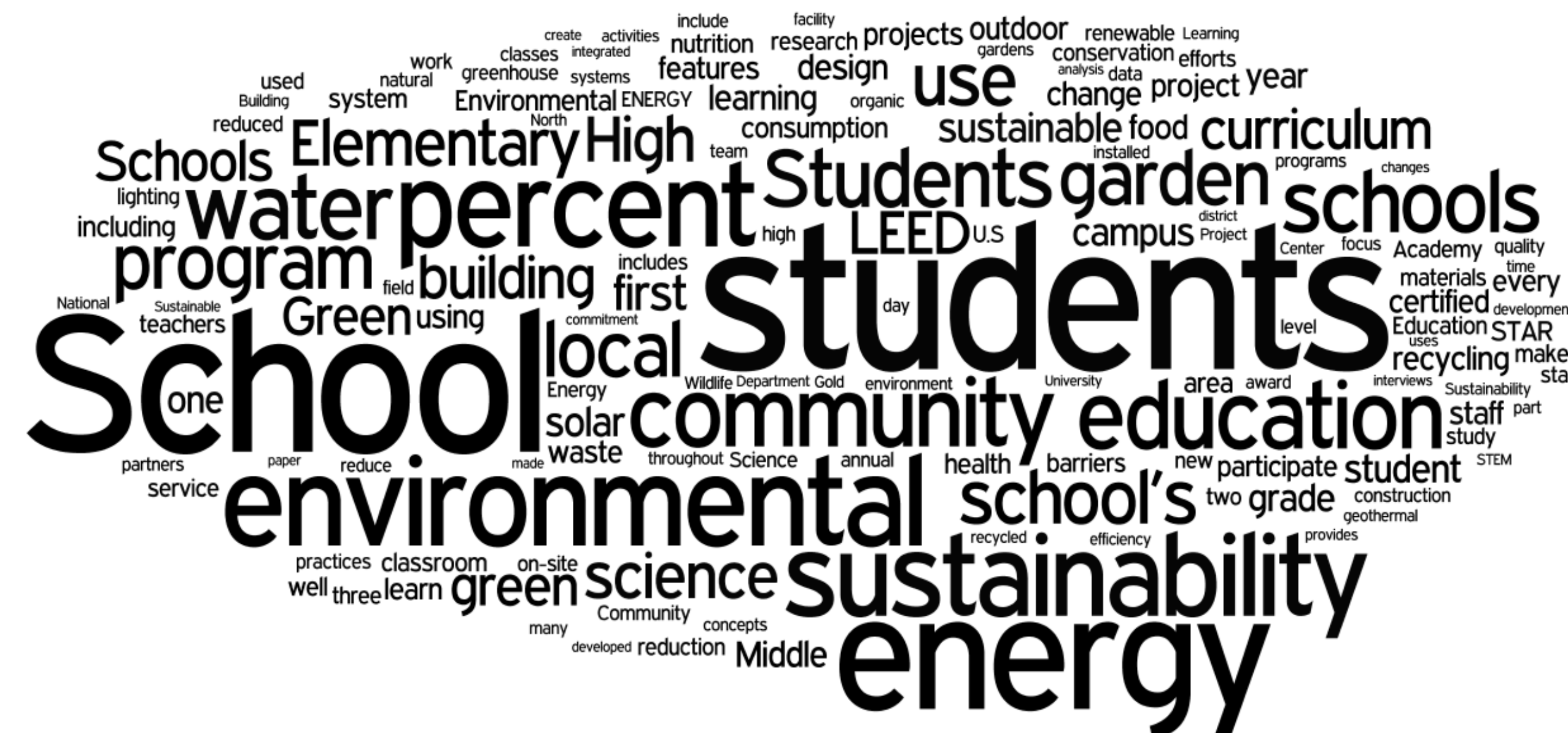
The Three C's (scale)

- Curriculum:** Teaching and Learning Classroom, Teacher/Student Actions, Programming, Professional Development
- Campus:** Values and Ways of Working Staff, Administration, Facilities, Grounds, Maintenance, District
- Community:** Wider Influence & Partnerships Parents, Businesses, Government, Non-profits, Neighborhood citizens and Global interests

The 3 focuses of Sustainability
The three focuses of sustainability model human well-being as resting on three interconnected and interdependent aspects of the world we live in: social needs, economic needs and ecological needs. Sustainable development is a normative concept in that sustainable solutions must seek to provide best outcomes for people of current and future generations and the natural environment.



In reality...



I analyzed certification applications, sustainability reports, interview transcripts, and case studies from 63 sustainable schools in the U.S.A (the same documents I used to create the 'wordle' above). The title of 'Sustainable School' was given to each k-12 school by one of the following certification programs:

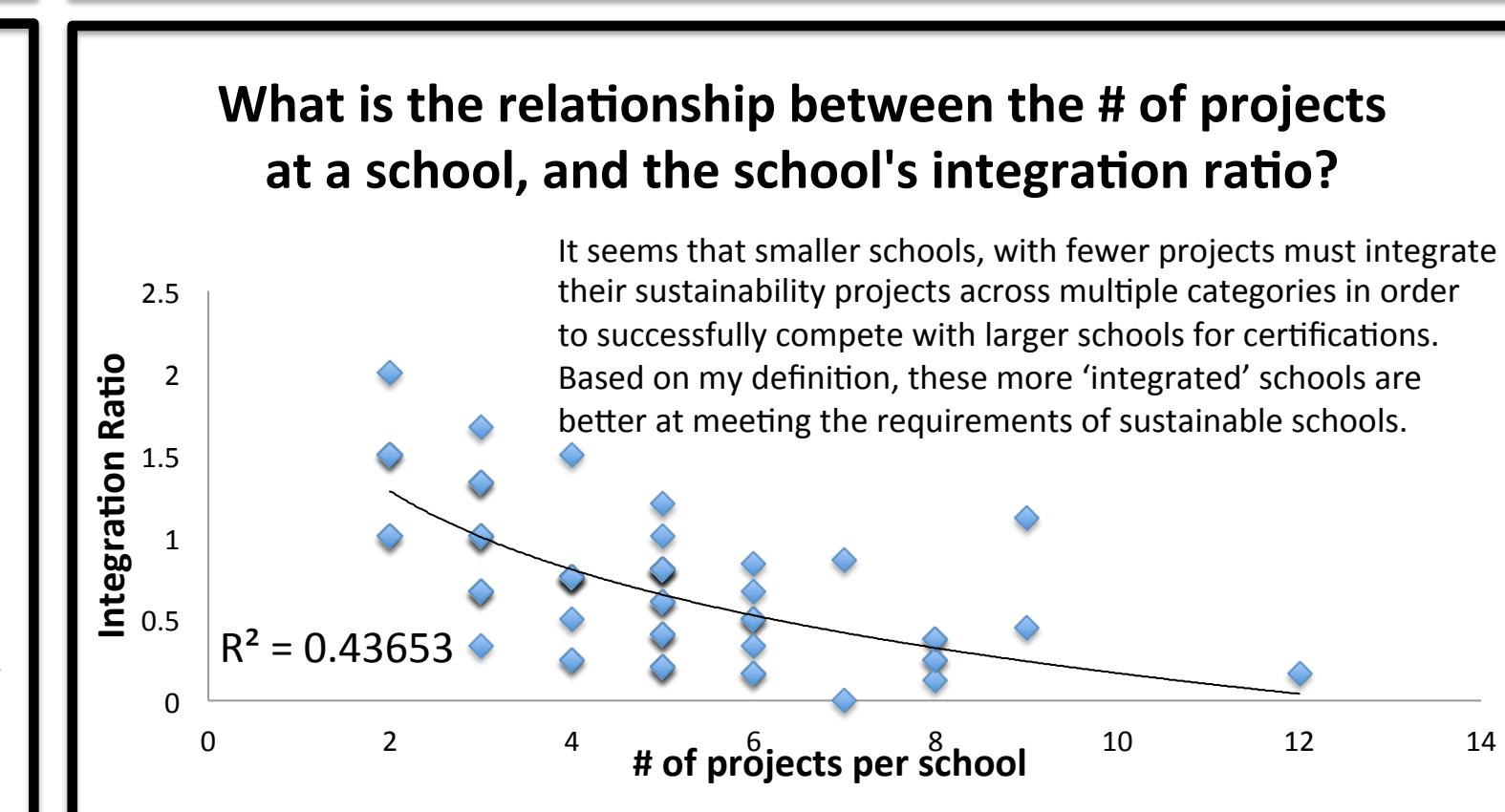
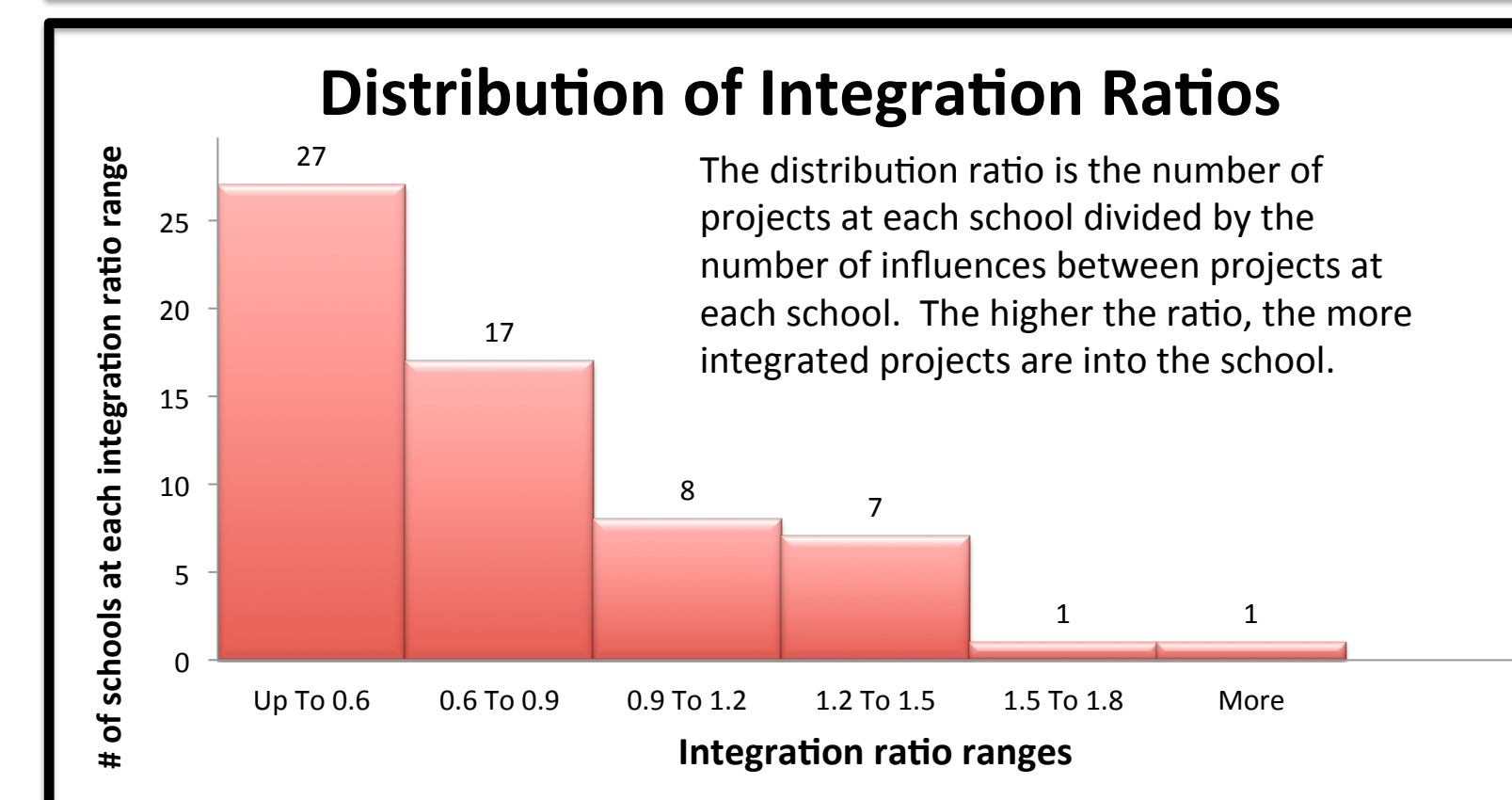
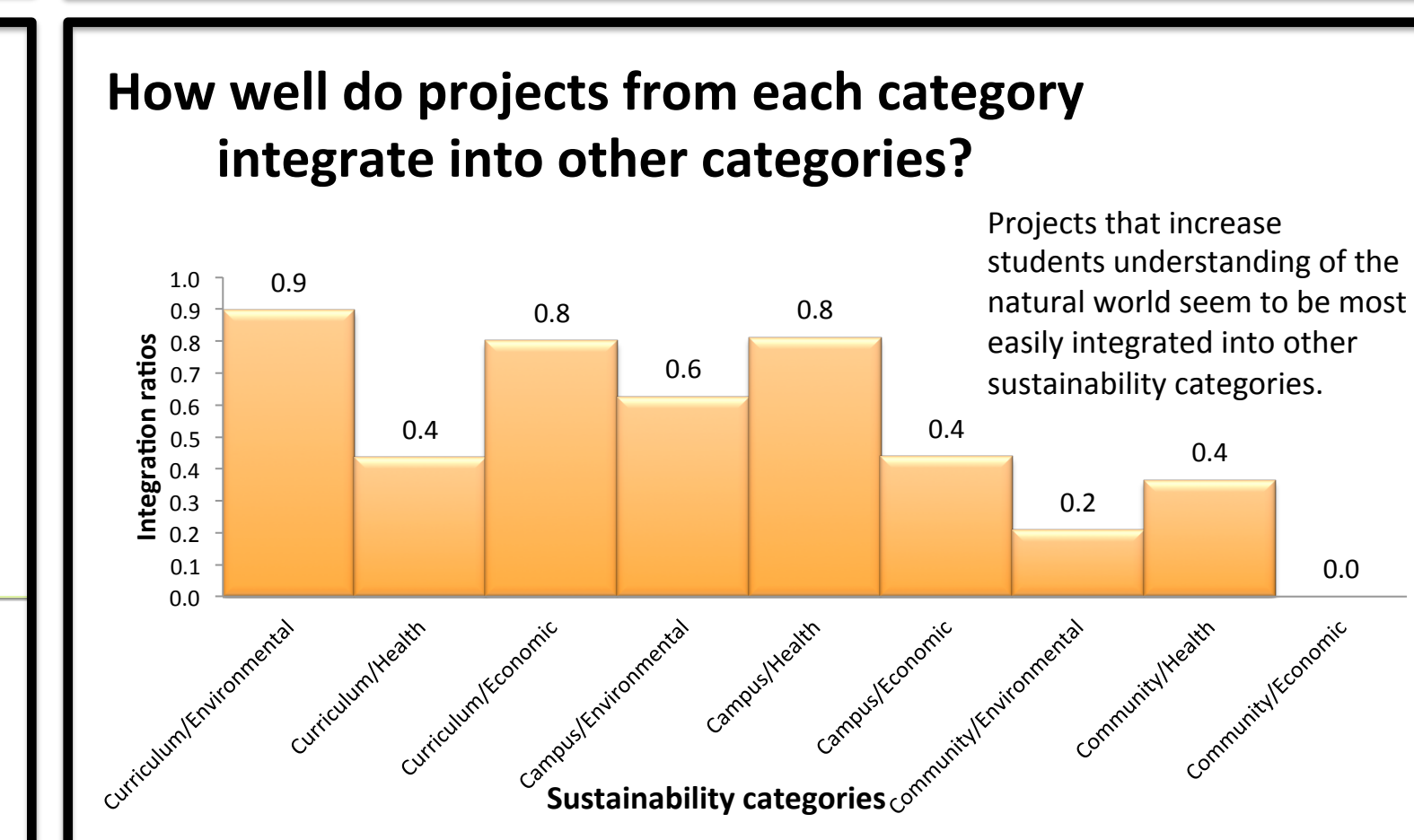
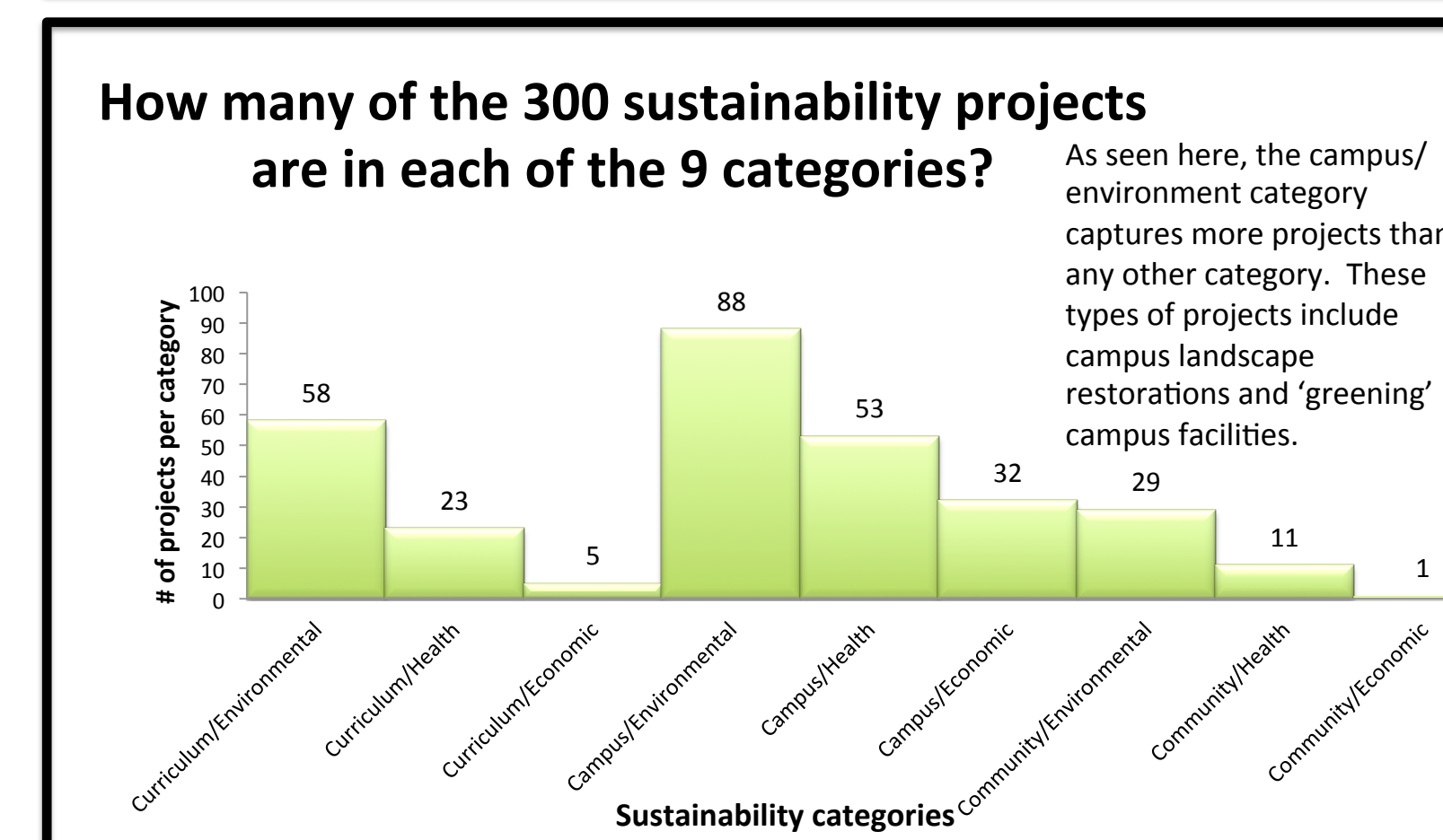
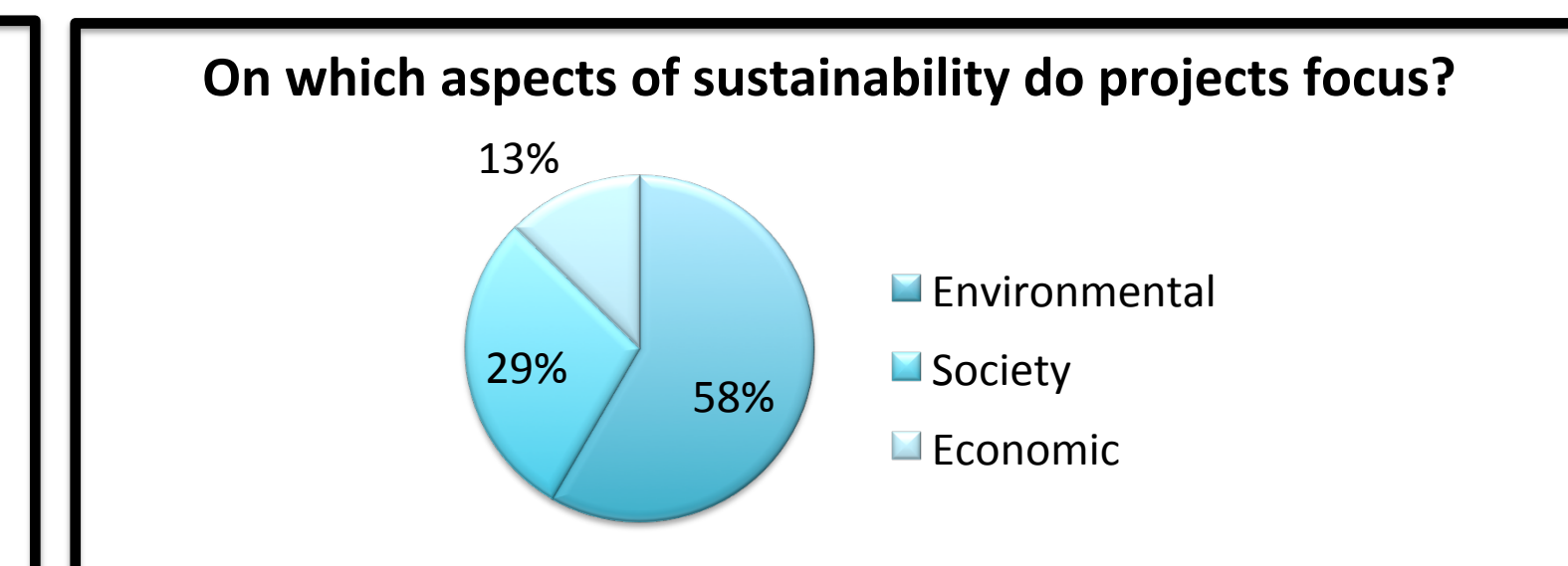
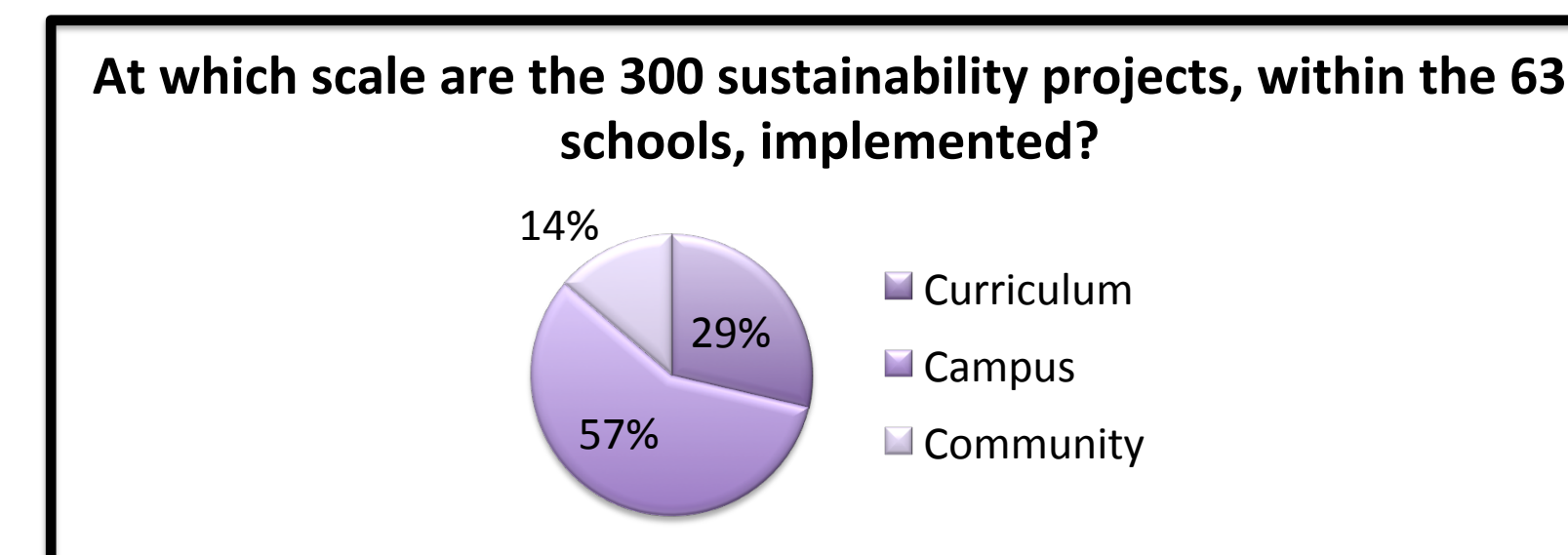
- U.S. Department of Education's Green Ribbon Program <http://www2.ed.gov/programs/green-ribbon-schools>,
- the USGBC's LEED for Schools Program (www.usgbc.org/LEED/SCHOOLS/), or
- the NSF-GK12 funded Sustainability Science for Sustainable Schools Program <http://sustainableschools.asu.edu/>.

I used our framework to analyze and code each school's sustainability efforts (as seen in the figure below). I categorized and labeled every sustainability project at each school. I conceptualized different projects at each school as having been initiated in one of the nine scale/focus categories (seen in the yellow squares below). Next, I determined if, and how each project promoted efforts in any of the remaining eight scale/focus categories. Using this coding system, I counted the number of sustainability projects at each of the 63 schools (300 in total across all schools), and the level of integration of each project. A project's integration across scales and sustainability focuses is considered crucial for sustainable schools, as described previously. In, the modified framework below, I provide a hypothetical example of how I coded information from each sustainable school.

Example Case: Hypothetical High School, USA

SUSTAINABILITY CATEGORIES	Sustainability focus of projects			Process of influence between scales and sustainability focuses
	Environment	Society	Economy	
Curriculum	(3) Hypothetical High uses the Project Wet curriculum to teach students about watershed conservation.	(4) All students participate in 20 minutes of stretching during each school day.		Process of influence between scales and sustainability focuses
Campus	(2) The biology teachers uses the garden to teach the 10 th grade ecology unit.	(2) Produce from the garden replaced students sugary snacks, and all produce is organic.	(1) Hypothetical High was able to achieve a 45% energy savings which equates to \$7000/year.	
Community	(1) Hypothetical High achieved LEED Gold certification for renovations to its existing building.	(2) Teachers at Hypothetical High designed and built a 2 acre campus vegetable garden.	(6) The Green Club designed an implemented a behavioral change program that resulted in a 5% energy savings per year.	
	(1) Hypothetical High holds workshops to teach community members to build and install their own solar water systems, using the schools system as an example. (3) Students design and implement watershed restoration projects in their community as part of the Project Wet curriculum.	(2) Extra produce is provided to the local food bank.	(5) The Humanitarian Club partnered with a local NGO to support the local food bank.	INFLUENCES BETWEEN CATEGORIES

Are our sustainable schools integrating projects across campuses and into communities?



Lessons learned - strategies to apply K-12 sustainability projects across a campus, and into curriculum and the community

The following points are a summary of my sustainable schools case study analysis. They include results, recommendations, and next steps.

- The 15 to 20 schools whose sustainability projects were most integrated across my nine sustainability categories seemed to fall into one of two general groups. These schools were either (1) newly constructed and designed with a 'vision' of sustainability, and they were typically promoted as a 'flagship' of the local school district, or were (2) small private schools with strong leadership. This begs the following question - how can existing public schools, especially those that are underfunded, implement sustainability projects that promote problem-solving to improve student, school, community, and global well-being? In the next phase of my research I will look for strategies to aid in the sustainability of underfunded public schools.
- The types of projects that were most successfully integrated across sustainability categories within my case-studies focused on either curriculum changes or student health. Most schools that initiated sustainability education programs relied on resources from the surrounding campuses and communities. This reliance, combined with the problem solving nature of sustainability, often led schools to initiate service projects where students would engage with their community to both learn and to improve their community's well-being. Student health interventions typically involved the construction of outdoor learning environments; many of these projects also promoted the interaction between schools and communities to source local, organic produce.
- In the next phase of my research, I will select a subset of my case study schools and interview teachers, administrators, and students to understand successes, opportunities, and barriers to the development and integration of sustainability projects at their schools.

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