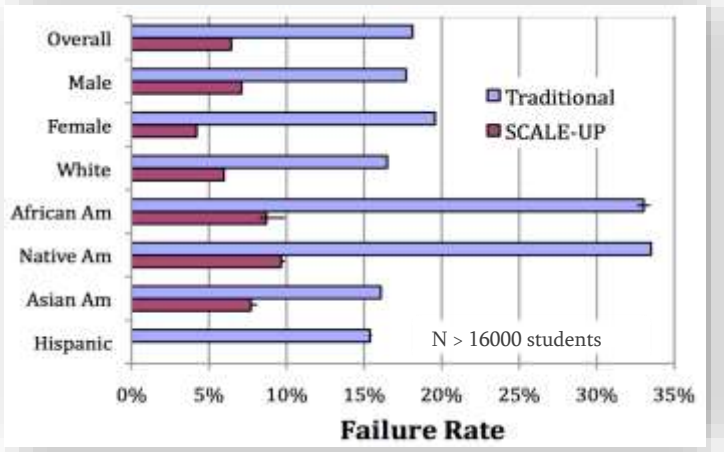
North Carolina State University
Reshaping Space to Facilitate Learning

user

ACTIVE, COLLABORATIVE LEARNING

KEY POINTS

1. The SCALE-UP name (Student Centered Active Learning Environment with Upside-down Pedagogies) describes the two parts of the reform: space and instruction.
2. Room design is based on two decades of research into ways space can facilitate active learning.
3. These spaces let teachers combine separate activities like lecture, lab, and recitation into a single, unified experience with raised standards for learning.
4. The approach has been adopted at hundreds of institutions across the US. Results are consistent–students learn more when they are actively engaged and help each other.
5. Teachers, through close interactions with their students, get much better feedback on who understands the material and who doesn't.
6. Students practice 21st century skills like presenting and evaluating the work of others.
7. The collaboration between faculty and administrators required to build the space actually contributes to the sustainability of the reform.



From Beichner, *National Academies White Paper 2008*

We replaced separate lecture and lab classes with a single course that meets in a special space. Students study with each other to support their learning of the foundational underpinnings of the material. The classroom facilitates their working together in collaborative teams to apply their newly forming knowledge to interesting situations. They look at real world problems, make measurements of everyday phenomena, and create their own computer simulations of what they've witnessed.

- *Robert J. Beichner, Alumni Distinguished Undergraduate Professor of Physics, North Carolina State University*

"Students were learning the material at a deeper conceptual level…The contributing factors were the hands-on nature of the classroom experience, the collaborative work format, and the availability of faculty and TA's for interaction during class…"
– abridged from external review

More: *Links to additional resources on the next page*

resources

scale-up

What goes on in the classroom?

There is some lecturing, but that is mostly to provide motivation and a view of the "big picture," which is difficult for students to see when they are not familiar with the entire course content. If you are lecturing for more than 15 minutes, you are probably talking too much. Most of the time students are answering questions, either by making observations and taking data or by working together to understand real-world situations. —Beichner

Student-Centered Active Learning with Upside Down Pedagogies
www.scaleup.ncsu.edu

the story

Why did you start?

My students were not as excited about physics as I am. The problem was that students needed to see why science is exciting. So I asked myself, 'what makes doing what I do (we do) exciting? What do I know about how my students think about science? What are the barriers to getting students to be more interested in and excited about science? How will we know what works? How do I get started? —Beichner

https://www.youtube.com/watch?v=E7FHuTNZHKc

the research

You have engineered a substantive research agenda on SCALE-UP from the beginning. What are two important outcomes of that research?

First, it works for all students, but particularly for women and underrepresented minorities. Second, it is essential to understand the role of classroom space in sustained implementation of studio-style instruction. —Beichner

https://stemeducationjournal.springeropen.com/articles/10.1186/s40594-016-0042-3

spaces that work

Placeholder for new 1-pager TOC roundtable architects' portfolios

from the roundtables

Placeholder for new 1-pager on the roundtable experience

from our archives

Placeholder for new 1-pager

from our collaborating partners

Placeholder for new 1-pager