**TRESTLE Case Study: *Building Community around Classroom Design in Engineering***

By JoAnn Browning (*joann.browning@utsa.edu*), Dean of the School of Engineering at the University of Texas San Antonio, former Associate Dean of the School of Engineering at the University of Kansas

Upon learning that the KU School of Engineering would be blessed with a **L**earned Hall **E**ngineering **E**xpansion **P**hase **2** (LEEP2), the school knew there would be classrooms. The faculty had worked in teams to help define the needs within the college for new spaces and classrooms were high on the list – because of overcrowding in the current facilities and the desire to ***leap*** into 21st century engineering education. The user design team for LEEP2 classrooms consisted of “teaching leaders” from each of the engineering departments. These were faculty who were recognized by their peers as leaders in the classroom, and therefore they would be able to carry the weight of the LEEP2 design team decision back to their departments and convince their colleagues to buy-in to the final designs.

In full disclosure, original plans for the building included a majority of traditional classroom spaces for 60-, 90-, 120-, and 160-person capacities that would require very little convincing of the traditional engineering faculty members. In other words, tiered classrooms were likely on the table for primary discussion. But the engineering faculty on the LEEP2 classroom design team refused to be held to that model, instead insisting that what educational research and benchmarking trips had shown to be the most effective model – a flipped classroom where engineering teams and group work would be the primary mode of learning – should be the focus of this facility.

The design was not completed without some dissent, however, as it soon became apparent that faculty in one department was very resistant to the idea of teaching in a classroom without a “front”, as the flipped classroom would consist of a teaching area in the center of the room and 8-person tables distributed throughout the room with LED monitors and whiteboards to aid group discussions. A compromise was sought and achieved. The offended department offered an alternate design, one in which there would be a lectern at the front of the room, but the rest of the space would consist of D-shaped tables with mobile monitors at the foot of the D. Knowing that their design was being implemented brought the entire school together with very little controversy.

The final element of implementing the design with maximum buy-in was realized with help from the architect and contractor, who had realized that library space that would be held empty for an entire semester was the exact dimension of one of the 60-person classrooms. The team was able to secure furniture and technology for the empty library space to create a mock-up of the future LEEP2 classroom so that faculty could use the space on a trial basis. By the end of that semester the space was the most-demanded room in the engineering complex for teaching, study sessions, student group meetings, and visiting scholars.

Lessons Learned:

1. Let the respected teachers in the departments, as representatives and advocates for their smaller department communities, lead the design of teaching spaces.
2. Use education research and benchmarking trips to allow teaching leaders to make informed decisions.
3. When controversy arises, allow the faculty with the highest degree of uncertainty to suggest compromises that would decrease their unease. And try to incorporate as much of what they suggest as possible.
4. Look for opportunities to mock-up new classroom designs so that faculty have the opportunity to debug any aspects that cause them angst before the building opens for business.
5. Respect the authority and the opinions of the teaching leaders in your school. They have years of experience in the environment that the new classrooms must serve and will be able to head-off problems of acceptance and buy-in before the facility is in service.

Application in a New Community

A new science and engineering building was granted to the University of Texas at San Antonio, and an evaluation of spaces indicated that teaching laboratories were going to be a large focus of the new facility. Lessons from LEEP2 were applied in this situation:

1. Interdisciplinary teams of instructors in fluids, instrumentation, controls, and senior design were formed with the most-respected teachers from each engineering department.
2. The instructors were able to design a suite of laboratories for each space that would take advantage of the expertise and equipment in each discipline to expand the traditional biomedical-, civil-, mechanical-, or electrical-focused teaching labs.
3. The curriculum is now being finalized and will be taught for two semesters prior to the opening of the new building, with labs being rotated through the departments. This will help to debug any of the equipment and space needs prior to the opening of the building.