Arriving at Spaces that Make a Difference

One of the most powerful stimuli for leaders to take a kaleidoscopic perspective on curricular and pedagogical change is planning and then completing the construction of new spaces and structures for undergraduate STEM communities. Because the financial stakes are so high, everyone's attention is captured. Stakes in regard to student learning are equally high. Faculty and administrators must determine if and how their physical facilities can support the research-rich, technology-intensive environments that lead to robust learning by undergraduate students; in like manner, they must explore if and how their spaces can foster the kind of natural science community that attracts all students into the study of STEM fields and motivates them to pursue careers in these fields.

Improved spaces make a difference in that they:

- create the opportunity for strengthening learning, with greater student access to opportunities to 'do science,' from introductory courses through upper-level courses for majors

- introduce an increasing number of students to the art and excitement of doing research, thereby fostering critical thinking, problem-solving,, and communication skills

- enable flexible scheduling and use, accommodating students with different learning styles and different career aspirations

- play a role in recruiting strong faculty, as candidates see the value the institution places on these disciplines and its commitment for the future

- accommodate emerging interdisciplinary thrusts in teaching, research and learning

- provide expanded technology infrastructures that support programmatic reforms based on an increased use of instructional technologies, and give students a command of the tools of information exchange essential for work and life-long learning

- leverage the search for external support, making the institution more competitive in obtaining grants for research, curriculum faculty development and instrumentation

- are occasions for revisiting institutional priorities, and for considering the allocation or reallocation of resources so that those priorities can be funded over the long term.

Arriving at such spaces involves revisiting institutional priorities, and considering the allocation or reallocation of resources so that those priorities can be funded over the long term.

Key questions should be asked while addressing institutional priorities.

About the nature of community

- how do we develop a true scientific community through the process of planning and in the spaces that result from our planning

- how can we use the planning process and the resulting spaces to encourage and enhance interactions-between faculty and student, faculty and faculty, student and student, as well as enhance interdisciplinary ventures

- how can this project avoid morale problems across the campus, when it is assumed that most institutional funding goes to the sciences

- how do we design for interdisciplinary research and learning that cuts across all departments when the project budget will not allow all departments to use the same facility

- what kind of spaces lead to more interactions among the disciplines, encourage collaborative learning pedagogies, and foster the cross-fertilization of ideas that promote a learning community?

About project goals

- how do we translate agreed-upon goals for student learning into spaces for learning

- how does this project further our primary curricular goals, which are to enhance interdisciplinary programs

- how do we link curricular planning and facilities planning

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- how do we ensure that the new spaces accommodate effective pedagogies and technologies most creatively

- how do you merge mission statements from individual departments into a common vision for the sciences on that campus, given that different departments have different needs and philosophies

- what impact can this planning process have on merging/simplifying administrative responsibilities

- if resources are insufficient to cover the gamut of science/science research (now or in the future), how do we explore and establish priorities

- how can this new facility not only be a state-of-the-art teaching/learning facility, but also a signature building that speaks to the identity and mission of our institution?

About bricks & mortar

- how do we decide between new spaces, renovated spaces, or a combination

- if we renovate, how do you minimize the impact on the current program, phasing the move from old to new spaces

- what are the best adjacencies for a facility that is to serve the future-between disciplines, between offices and research spaces, between formal and informal learning spaces, and with other campus facilities

- how do we arrive at a safe working and learning environment: what are the safety, security, aesthetic, and instructional issues associated with windows and laboratories

- what are the pros and cons associated with multipurpose labs

- how can a building be rehabilitated in such a way as to preserve its architectural integrity, while supporting modern research and teaching

- how do we get everything we want with the space and funds that are allocated

- how can we address strategically our current mechanical difficulties and space challenges during and through the process of planning our renovation?

About budget & finance

- in setting project goals, what percentages need to be established between current costs and costs for ongoing maintenance and upgrading

- how can the planning for these spaces accommodate future needs to keep upgrading research spaces and instrumentation

- how do we set priorities-in ways that maximize opportunities for admissions and cost savings - for the many possible interdisciplinary connections that these spaces might nurture

- what factors are commonly overlooked in developing a cost estimate for the project

- how can the results of the programming process be used to help obtain funding for the project?

About the future

- how do you plan spaces that accommodate the emerging fields in science

- how do you identify what impact rapidly changing fields of science and technology will have on the future of our spaces and our program— envision the role of technology in undergraduate learning/research

- how do you plan spaces that are flexible and adaptable, that bring advances in how science is practiced into the environment where science is learned

- how do you link facilities planning to institutional planning so this project leads to greater institutional distinction over the long-term

- how do you arrive at reconfigurable spaces that meet changing priorities over the life of the building?

About people

- how do you select a programmer, when do you select one

- how do you select an architect and/or review the work of potential architects

- what constitutes an effective planning team in terms of mix of faculty (teaching/research), staff, students, administrators, and who are the external members of the team

- what is the role of the faculty shepherd? ▶

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About nuts & bolts

◆ how long does each stage of the planning process usually take: curriculum review; programming; etc.

◆ how can we transform a dark, unfriendly building into one that is student-centered, with instructional and social areas that promote collaboration and active learning among the diverse students on our commuter campus; what steps can be taken before a full-fledged renovation is possible

◆ how do you ensure that the project that is actually built is the one that was defined in the design stage?

A final comment

While we recognize that we need new facilities, we also recognize that we are not yet ready for new facilities. We need to identify ways to enhance interactions among the departments involved, to ensure that the science, mathematics and engineering faculty as a community share these goals. We need to continue to evolve, and to plan to continue to evolve, with respect to curricular innovation and concern for student learning, so that our new/renovated spaces are merely a step in a process of improvement. Given the time within which these renovations can be completed, many of our current faculty will not inhabit fully renovated facilities before they retire. Nevertheless, they can play key roles in the continued evolution of our program. ■