

WHAT WORKS - PKAL LESSONS LEARNED

KECK/PKAL CONSULTATION REPORTS

PKAL facilitates Keck consultancies in which institutions request experts to analyze specific reform issues. Requests range from assistance with new program development, curricular reform efforts, constructing new STEM facilities. Over 175 colleges and universities around the country have received a KECK/PKAL consultancy. This report takes the form of a letter to the president of a college or university.

To: The President

From: The Keck/PKAL Consultant Team

We perceive that several individuals (perhaps the majority) have clear notions of the way things should be in the new spaces, are firmly entrenched in their convictions, unwilling to consider other options. This is why your planning process is stalled.

All faculty should remain open in regard to all possibilities— what is to be taught, how it is to be taught, as well as about numbers of students and faculty, class and lab size, class and lab frequency. This is what the process of planning is about.

Campus leaders should ensure questions being addressed at the institutional level are integrated into the planning now underway within the division of sciences.

In concert with colleagues across the campus, STEM faculty should be asking:

- ◆ are there institutional assumptions about size of future enrollments, size of faculty and staff that will affect our program
- ◆ do discussions about graduation requirements and/or collective expectations for student learning goals have the potential to affect our program
- ◆ what is to be our measure of institutional distinction, and how does that relate to factors that affect the quality and character of STEM programs, such as undergraduate research, learning technologies, interdisciplinary programs
- ◆ how do we define what it means to be a community of learners?

As divisional faculty deal with such questions, they should turn to questions more directly relating to the study and practice in STEM fields, including:

- ◆ how will science be practiced in the future and how might that affect how science is learned on our campus
- ◆ will certain approaches, like the integration of lecture and lab, enhance the learning of our students— today and tomorrow?

KECK CONSULTANCIES

With support from the W. M. Keck Foundation since 1994, PKAL has provided consulting teams of senior faculty and administrators to institutions requesting assistance in continuing reforms begun at a PKAL-sponsored workshop. For reforms in undergraduate science and mathematics to take root and become institutionalized, external advice and counsel is needed at critical stages. Reports, phone calls and letters received from faculty and presidents of Keck institutions speak of critical forward steps aided by the advice of the Keck/PKAL Consultants.

DANGERS TO AVOID IN PLANNING

- ◆ planning focusing on problems not solutions
- ◆ planning spaces rather than programs
- ◆ planning from the departmental rather than institutional perspective
- ◆ planning driven by senior faculty alone
- ◆ planning not connected to broader institutional vision

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Dealing with specific questions encourages broader and more regular discussions about the shape of the curriculum, for example: how the mathematics curriculum connects to other science offerings; or what biology majors need to learn in their first courses in chemistry. There should be institutional support to bring visitors to the campus to facilitate these conversations (also for the food that always plays an important role in building and sustaining community!).

Only after the division has come to some closure about the shape of the program of the future should they move to considering the character of new spaces; but, be ever mindful of the role of different players in the planning process. Architects, not faculty, design spaces, and they do so based on the dreams of the faculty for the program to be housed in those spaces.

For example, many undergraduate STEM programs are becoming more interdisciplinary, reflecting the world of science beyond the campus. Figuring how if and how interdisciplinary programs will be a part of your institutional future will involve discussions within and beyond the sciences on your campus. Further, considering the potential of interdisciplinary efforts on your campus will influence discussions about serving STEM majors, preparing them for graduate or professional school. Your faculty is justly proud of its record in preparing students for graduate school and this is a thread to be woven into their planning for the future.

But they should not rest on their laurels. We are concerned that the science program for the non-major has not been considered as thoughtfully as that for STEM majors. How you wrestle with this question at the programmatic level has considerable implications for the new spaces under consideration, just as considering how to serve majors. Courses designed for non-majors, perhaps taught by cross-disciplinary and interdisciplinary teams of faculty, must be served in your new spaces, but how that can happen can only be determined after your community has come to some agreement about the central role of science in the education of all your students.

We began with a recommendation that you and your administrative colleagues facilitate the dissolving of the compartmentalization (isolation) that appears to be present in your science division. We believe attention to programs for non-majors would be a good place to begin.

There are more issues to address, but these reflect our conviction, based on experience, that the program should drive the facility, not the reverse. Regular and open discussions about program will lead to discussions about what kinds of spaces will serve your purpose, including what kind of spaces can be shared (and which are not possible to share).

All of the above calls for clear administrative support for and involvement in the process. Faculty are currently uncertain whether the time to be spent in planning will be time well-spent. Modest sums spent on faculty planning meetings, resources for pedagogical pilots, and for the cosmetic or more substantial physical improvements (paid for from the operating budget) will all signal to faculty that this project is an institutional priority.

So, our primary recommendation is to invite your faculty to step back from planning spaces to give serious attention to the program, in the context of institutional vision and goals, signaling through your visible and tangible support that building and sustaining a first-rate science program is an institutional priority.



P.S. Included below are other ways to encourage faculty to look on program and space in new ways:



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Support curricular experimentation

Many institutions, during the years of planning, modify existing spaces so to pilot new approaches to teaching and learning. There seems to be a consensus among your faculty (one thing they agree on) that the optimum size for lecture/discussions is forty to fifty students. Provide funds to remove fixed table arm chairs in classroom and replace them with chairs and tables on wheels, in two rows on each tier. This will enable students to break into small discussion groups, at little cost. Faculty should monitor and discuss the impact of such new arrangements on their teaching and on the learning of their students. This should lead to greater willingness of faculty to explore new options, as they are no longer faced with immovable furniture that locks them into an out-dated teaching style. A similar step toward giving faculty and students experience with different kinds of physical spaces would be to add lab demonstration benches in the large lecture room that serves the large general courses.

Understand space utilization

As you move well into the process, there are other campus-wide issues to address. A critical one is space utilization. All learning spaces are campus-wide resources, not “owned” by single department or departments. Take time for faculty, working with appropriate administrators, to develop a mock schedule for a year for all courses and labs to be taught for STEM students. This will help identify both under-utilized spaces and what spaces are needed. As you

do this, determine which STEM courses can be taught elsewhere on the campus, and/or if departments in other divisions can use under-utilized spaces in the science building. This comprehensive look at how and when spaces are used can be another catalyst to thinking more creatively about shaping your spaces for the future, and to achieving the most efficient use of all your spaces.

Remodel for community

Further, your current science buildings lack a sense of community, perhaps one factor in the lack of open discussion among faculty about the future of program and space. Informal gathering spaces should be located at the end of each corridor, and better use could be made of the central lobby as a place for interactions of students, students and faculty, faculty and faculty. Hallways full of whiteboards and bulletin boards encourage the communication that is essential to a vibrant community.

Recognize that even if the decision was made right now to build, it would be at least five years before the project is complete. This means that something must be done now with the current building both in regard to safety and code, and in regard to spirit and morale within the community that uses those spaces. Identifying what people value in the environment in which they work in will help you decide about cosmetic, structural, and safety improvements to make now. The audit suggested above will help you make such decisions in ways that have some long-term viability in regard to institution-wide planning .

Seek external support

Concurrent with efforts focusing directly on program and space, there

should be a carefully-coordinated initiative to external support for immediate and ongoing curricular changes (reshaping existing courses, designing implementing new courses, securing new instrumentation, etc.) Success on this front will enable faculty to strengthen the program while at the same time reinforcing their reputation. This will enhance your ability to secure gifts and grants necessary to complete a new facility. While disappointments will arise along the way, the eventual payoff will be significant. A climate of good grantsmanship is of long-term benefit. However, just as with the planning effort, the administration needs to provide tangible support for this dimension of institutional advancement.

Ensure faculty technology skills

Just as we recommend that seeking external support be integrated into the planning process, a further recommendation is that over the next three years you take steps to develop and implement a strategy to ensure all faculty are comfortable with technology. Released-time to develop curriculum, support for attending workshops, funds for equipment and software, and providing technical support are all important. Particularly in the context of planning for a new facility which will be more technology-intensive than current spaces on campus, the importance of technical support staff in adequate numbers cannot be overemphasized. ■