3 strategies

for planning open-concept lab and scientific spaces

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Today's move toward 'labs without boundaries' requires maximizing efficiency, making a cultural shift, and focusing on teamwork

Many lab and scientific space designs at higher education institutions have simply followed the traditional method of segregated labs broken down by discipline. But open concepts are gaining popularity now, through demonstrated adaptability and efficiency.

That's why designers are beginning to ask whether the future state could be labs without boundaries. Many universities are also looking at interdepartmental relationships with a fresh eye to exploring new research opportunities in open labs.

Ultimately, to reduce barriers to collaboration, designers aim to first understand what composes a boundary. There are some situations that will always call for an enclosed lab—such as environmental and security concerns for research samples. Yet it is still possible to break down barriers while considering these needs through engineering studies and planning that takes security risks into account.

The first step to defining a boundary is asking where it is really necessary and where it can be broken down, or even where doors could help facilitate easy movement where walls are truly necessary.

Here are the top three strategies to consider when planning new open-concept lab and scientific spaces.

1. Optimizing space

With tighter restrictions on available resources, optimizing the use of space is one of the main considerations for science buildings today. Managing space involves how space is assigned. Some institutions have more experience navigating space management. Larger universities tend to have more involvement than smaller ones, for example.

Traditionally, smaller-scaled, enclosed spaces have been favored by individual researchers, with their names

identifying the spaces. This can lead to ownership issues when the model shifts toward a more open lab. Also, many research labs are funded by outside sources, such as the National Institutes of Health or the National Science Foundation, so space needs may fluctuate with available funding for new research. Universities are challenged with adapting to these changes, and open lab concepts offer one strategy to operate more efficiently.

When space is at a premium, universities employ different metrics to determine how much space is allotted to researchers. At the same time, the types of spaces available for lab research are changing and evolving as well. These depend more on the type of research they are used for and also account for the support and specialty space needed for specific lab functions.

Most researchers need basic bench space, and some also have specialized needs, such as contaminant-free areas, secure storage, a dark environment or a containment facility. With a deeper examination into these special needs, the ratio of laboratory-to-support space is changing, with more space allocated to support and smaller, often shared or open-concept spaces for general use.

ABOVE | *Georgia State Science Park*
COVER | *Miami University Pearson Hall Laboratory*

Universities are tasked with explaining such changes to the researchers, who may be reluctant to give up "their" space in favor of a more efficient layout. One key strategy to organize spaces by use is to designate core facilities that can be shared by smaller groups who require the same equipment or support spaces. Rather than duplicating the same types of spaces for a handful of researchers who need them, core facilities are shared specialty labs. These are especially useful for costly equipment or instruments that need to be replaced often.

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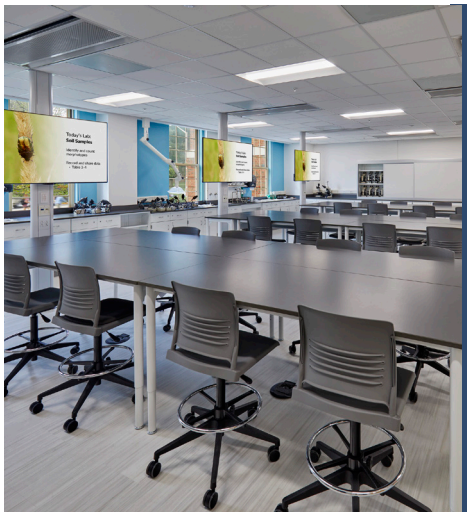

Funding sources can be spread to more recipients with shared core facilities, and replacing equipment is more manageable when the cost is shared across multiple user groups.

This model works because most researchers who need high-level equipment—such as special microscopes or nuclear magnetic resonance machines—aren't using such equipment full time, which makes sharing feasible. The core facilities can be controlled by a manager who runs the space; trains technical leaders in the proper use of the equipment; or does the testing and analysis for the other researchers, as a designated operator.

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2. Making a cultural shift (starting at the top)

The university's culture is an important factor to the successful implementation of new protocols. Guidance and support at the leadership level can help resolve any issues that emerge when researchers have questions.

When it becomes a matter of convincing researchers who have traditionally had their own labs that an open concept is the best choice, stakeholders can employ several strategies. Stakeholders can turn to project teams to demonstrate the benefits of an open lab to researchers, showing examples that illustrate the value of this approach.

In one example project, labs had historically been designated by department (chemistry, biochemistry, genetics, etc.). Each department would have a floor or lab assigned to the researchers under contract.

When leaders discovered the labs were underutilized, they wanted to move toward a more efficient approach: Optimize the available space by having the ability to assign space to another department. However, departments were reticent to relinquish the space and furnished the old contracts to retain it. As a result, the university has been giving incentives to receive lab space from the departments so they can reassign it for a more efficient use.

This type of cultural shift is not unusual and is not restricted to scientists and labs; the ownership mindset is prevalent in offices that shift to an open concept as well.

To get buy-in from researchers, frame the discussion emphasizing the benefits of adaptability and agility that are inherent in an open layout. Pointing to successful examples can also highlight benefits, like Notre Dame, which has a neighborhood plan including open lab concepts and informal boundaries for researchers. In that example, on a master plan, lines delineate zones to particular researchers, and the researchers are aware of the boundaries, but to a visitor, there are no visible lines from one space to the next within the lab.

When a researcher needs to expand or reduce their space, or when a new researcher comes in and only needs a small space, it is much easier to find underutilized areas that can be co-opted in a large, open lab than a small, single lab.

3. Focusing on teamwork in the lab

Workspaces that encourage collaboration are growing in popularity. Collocating disciplines can spawn a number of unexpected discussions and opportunities for further research.

Consider zones. The space breakdown within the lab can easily change as needs and uses evolve over time. The discussion of zones is starting to extend outside the lab to what belongs inside and outside the lab, and what that zone line consists of. Often, this choice comes down to regulations that prohibit certain activities in the lab, such as eating and drinking.

With technology becoming more mobile, much of the analytical work that had been relegated to the lab has now been pushed outside the lab.

Because of the air quality and other environmental conditions that must be maintained in a lab, some type of physical barrier is needed between work areas and analytical spaces. But this can consist of a partial wall with glass to create a visual connection and prompt opportunities for collaboration.

Shared equipment also creates a destination for researchers who might not otherwise have an opportunity to come together and discuss their work. One example project designed a nondepartmental building for a neuroscience facility. They assigned research space based on a particular disease study—dementia, addiction, pain, etc. Then, leaders brought in researchers from different

departments—biochemistry, psychology, anesthesiology—to work together in one lab for a unique research opportunity.

Strategic management decisions inspired the design that resulted in this successful collaborative approach. Once installed in the multidisciplinary labs, researchers wanted to work collaboratively because the groupings were organic and supported teamwork in research.

With the innovations that have resulted from breaking down boundaries and encouraging collaboration through shared spaces, industry leaders and project teams continue to seek opportunities to remove barriers.

Looking at strategic adjacencies for research groups in new ways—such as the disease focus in the neuroscience unit—is a good start.

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