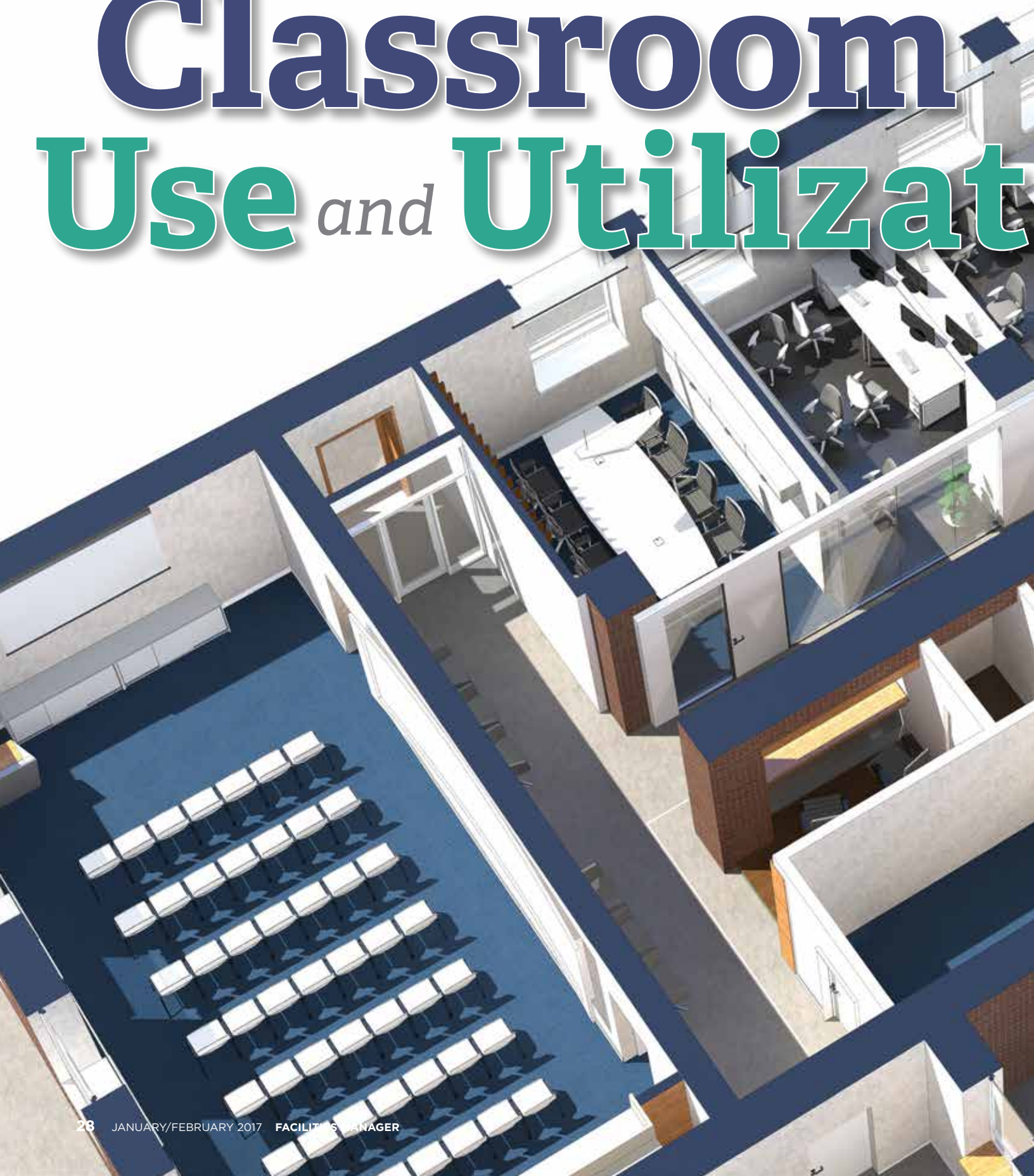
Classroom Use and Utilizat



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by Ira Fink, Ph.D., FAIA

Improving classroom and class laboratory use and utilization has been and remains an important issue for many campuses. To help planners measure classroom and class laboratory use, 15 years ago I authored two articles ("Classroom Use and Utilization" and "Class Laboratories: Space Use and Utilization") for APPA's *Facilities Manager*.[1] This article augments what we knew then with what we have since learned and offers some additional suggestions for improvement.

This article covers three areas of classroom and class laboratory use: 1) metrics—the historical basis for measurements, which serve as both an archival record and provide a context for classroom use analysis; 2) measurements—data and findings from recent classroom use studies that provide new information for understanding instructional space use and the factors that influence it, including decisions on course and classroom scheduling and management; and 3) management—ideas for improving classroom use and utilization.

THE HISTORY

The metrics related to space and utilization were shaped by the education environment at the time they were developed; these metrics have had a long-lasting impact on higher education.

The Academic Course Metric

The academic course, which is the basic building block of instructional space use analysis, had its origin in 1906 when the Carnegie Foundation for the Advancement of Teaching created a pension system for the nation's college professors. To participate in the Carnegie pension system, higher education institutions were required to adopt a set of basic standards around courses of instruction, facilities, staffing, and admissions criteria.[2]

One of the Carnegie core elements was the concept of a "credit hour." As a metric, the credit hours students receive toward their degree were based on the number of contact hours they spent per week in class per semester. A typical three-credit course typically would meet for three hours per week over a 15-week semester. And thus, the one-hour class metric was born more than 100 years ago.

Classroom Space Metric

In 1923, the City of New York sponsored a survey of junior high schools and their space needs,[3] including a preliminary analysis linking space to educational requirements. This study was followed in 1924 by a report on high school programs published by the Teachers College of Columbia University.[4] According to the report's author, "the capacity of each classroom and study hall were determined on the basis of 15 square feet of floor space and 200 cubic feet of air for each student." With this narrative, the metric of 15 square feet per student in classroom space began, based on how students in New York City high schools were being educated.

Classroom Space Needs

Two decades later, the metric of space per student emerged from two studies of higher education space needs in California. The first, known as the "Strayer Committee Report," published its recommendations in 1948 in *A Report of a Survey of the Needs of California in Higher Education*.[5]

In the *Restudy of the Needs of California in Higher Education* published in 1955 by the California State Department of Education,[6] empirical data on classroom use in 1953 on the University of California (UC) and the California State Colleges (CSC) (now the California State University system) campuses served as the baseline for classroom utilization.

Continued Change in Utilization Standards

The comprehensive *Restudy* was confirmed a decade later in 1966 by the California Coordinating Council for Higher Education (CCHE), which established space standard metrics including use and utilization criteria for California higher education.[7]

As noted by the California Legislative Analyst's Office, classroom and class laboratory utilization standards historically have been developed based on:[8]

- Hours per week of room availability.
- Percentage of time a room is in use when it is available.
- Percentage of stations in a room that are occupied when the room is in use.

The evolution of classroom utilization metrics in California, and mirrored across the United States, is summarized in Table 1. The metrics shift up and down every few years, with no new statewide empirical study of classroom utilization conducted since the 1953 studies at UC and CSC, nearly 65 years ago. *(See Table 1 on page 33.)*

The University of California and the California State University both follow legislative requirements enacted in 1970 and 1973 to meet California's use and utilization requirements. These produce a single metric based on classrooms available for use 14 hours a day, from 8:00 a.m. to 10:00 p.m., five days a week, or 70 hours per week. Class laboratories (teaching laboratories) are expected to be available from 8:00 a.m. to 5:00 p.m., five days a week, or a total of 45 hours per week.[9] This results in a classroom use of 35 weekly student contact hours per classroom station and 20 hours per week per class laboratory station.[10, 11]

MEASUREMENTS, DATA, AND FINDINGS FROM RECENT INSTRUCTIONAL USE STUDIES

While conducting classroom utilization studies and measuring the percentage of utilization of rooms across an entire campus provides an overall gauge of how well rooms are being used and utilized, these aggregate utilization measures do not reveal the reasons for the results.

Our firm's classroom utilization studies over the past decade have allowed us to isolate and analyze a variety of measurements to help campuses understand the reasons for their use and utilization rates. These analyses show at least four factors that influence classroom utilization rates:

1. Course Scheduling Decisions

- **Courses vary in length and frequency.** The traditional Carnegie concept of the credit hour that led to courses taught three days a week for one hour each is no longer the primary mode of instruction delivery at many campuses.

  As shown in Table 2, which presents results from four recent classroom utilization studies, the three-day-a-week course (Monday-Wednesday-Friday or another three-day combination) occurs, on average, only 23 to 40 percent of the time at these campuses, with some campuses reporting as low as 7 or 8 percent. *(See Table 2 on page 35.)*

- **Courses are taught with variable start and end times.** Campuses frequently do not use the one-hour course or a similar variant as the standard they follow. For example, for pedagogical purposes, at the Seaver College of Pepperdine University, many courses are one-and-one-half or two hours long, while other courses are held for one hour.

  Scheduling courses to fit and stay within scheduled start and end time course schedule blocks is essential if campuses want effective utilization. Allowing a course to start on a regular time block, but extend past the standard ending time, can create a situation where the hour that follows cannot be scheduled, resulting in lower use and utilization.

2. Room Scheduling Decisions

- **Courses are frequently taught only one or two days a week.** In a small sample of campuses, the most frequent instructional practice consisted of courses that are taught one or two days per week, which occurs for 60 to 90 percent of courses. These can be any single day or any two days, with Tuesday-Thursday dominating. When courses are taught on one or two days per week, classroom utilization can be high, but only if courses are paired to cover all or most days of the week. In well-planned course pairing, two courses share a five-day week: either a three-day-per-week course paired with a two-day-per-week course, or two two-day-per-week courses paired with one one-day-per-week course.

- **Some courses require longer instructional time.** To overcome the negative utilization impact of courses that require longer class hours and leave open unused blocks of

Table 1: Evolution of Current Utilization Metrics for Higher Education Instructional Space in California

Category	Rooms Assigned				
	Total Room Availability – (Hours per Week)	(Hours per Week)	Percentage of Available Rooms in Use	Stations Occupied When Rooms in Use (Percent)	Stations Occupied When Rooms in Use (Percent)
1948—Strayer					
Classrooms	45	29	65%	no standard	—
Teaching Laboratories	45	29	65%	no standard	—
1955—Restudy					
Classrooms	45	36	80%	67%	24.0
Teaching Laboratories	45	24	53%	80%	19.2
1960—Master Plan					
Classrooms	45	30	67%	60%	18.0
Teaching Laboratories	45	20	44%	80%	16.0
1966—CCHE[a]					
Classrooms	45	34	75%	66%	22.4
Teaching Laboratories					
Lower Division	45	25	56%	85%	21.3
Upper Division	45	20	44%	80%	16.0
1970—ACR 151[b]					
Classrooms	70	52.5	75%	67%	35.0
1973—Budget Act[b]					
Teaching Laboratories					
Lower Division	45	27.5	61%	85%	23.4
Upper Division	45	22	49%	80%	17.6
1980—Community Colleges[b]					
Classrooms (large campus)	70	53	76%	66%	35.0
Classrooms (small campus)	70	48	69%	66%	31.7
Teaching Laboratories	70	27.5	39%	85%	23.4
1990—CPEC[c]					
Classrooms	70	varied	—	varied	30.0
Teaching Laboratories	45	varied	—	varied	varied

a: Coordinating Council for Higher Education.
b: Assembly Concurrent Resolution. Source for standards currently in use.
c: California Postsecondary Education Commission.

Source: *http://www.lao.ca.gov/2003/flexible_facility/flexible_facility.html*

Table 2: Standard Course Meetings, Classroom Days per Week

	Campus A	Campus B	Campus C	Campus D	Campus E
		Central Classrooms	*Department Classrooms*		
Days per Week of Scheduled Courses	**Very Large Public**	**Very Large Public**	**Very Large Public**	**Mid-Size Public**	**Small Private**
One Day per Week	21.6%	51.4%	60.4%	15.0%	19.5%
Two Days per Week	54.8	36.6	30.0	44.1	64.1
Three Days per Week	23.4	7.7	7.1	40.4	6.5
Four Days per Week	0.2	2.7	1.9	0.5	9.9
Five Days per Week	0.0	1.6	0.6	0.0	0.0
Total	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Ira Fink and Associates, Inc.

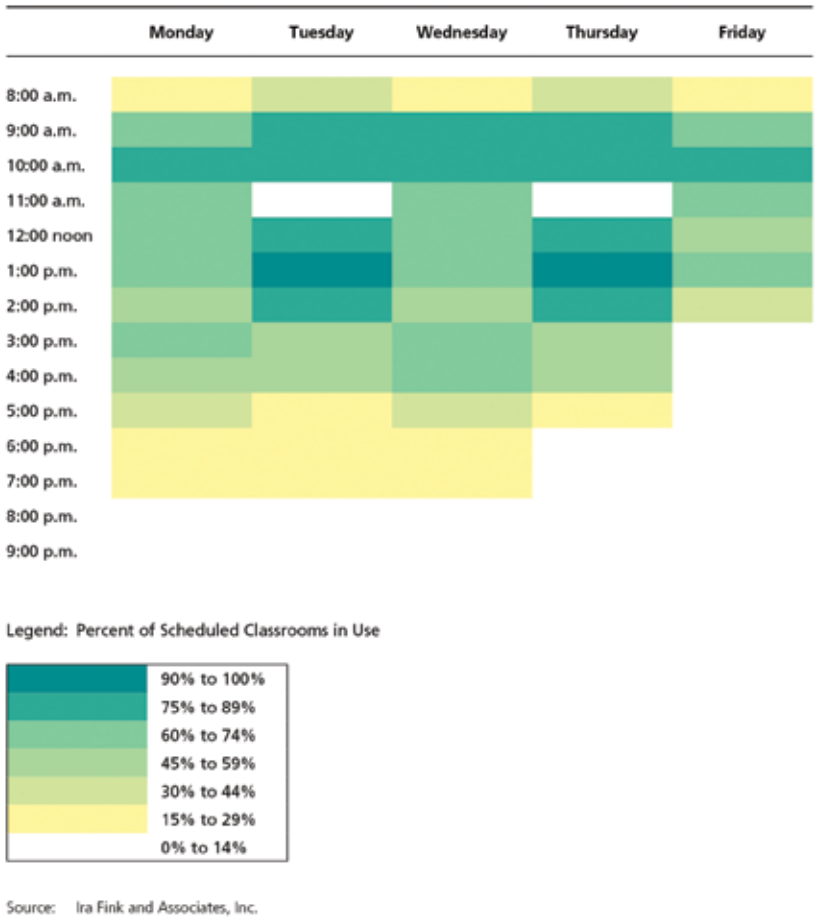
classroom time, some campuses move these longer courses to midafternoon, where extending the time block does not have a significant detrimental effect on scheduling. For example, at the University of Iowa, classes that meet for two consecutive hours or three consecutive hours on the same day are not scheduled on weekdays earlier than 2:30 p.m. in general assignment classrooms.[12]

- **Longer transfer time is required between classes.** On some campuses, the instructional period is not typically a 50-minute instruction period with a 10-minute transfer time between classes, with a total course hour of 60 minutes. There can be several different variants. For example, at very large campuses, such as Ohio State University, the typical instruction time is 48 minutes with a 12-minute transfer time, which maintains the number of 60-minute time blocks per day. As an alternative, at Virginia Tech, the University of Connecticut, and Clemson University, the typical instructional block is 50 minutes with a 15-minute break, which results in a total 65-minute time block. These 65-minute block schedules result in the need to eliminate one full instructional period when the longer 15-minute transfer periods and total 65-minute time blocks are amassed over an entire day. This also can affect utilization rates.

- **Classrooms are entirely blocked from use during certain instructional hours.** Campuses sometimes choose to block rooms from instructional use entirely during high-demand times in the academic week. Shown in Table 3 is an example of room use at one campus, where on Tuesday and Thursday from 11:00 a.m. to 12:00 noon there are no scheduled courses. This is not an error; it is intentionally done to block time for faculty meetings and related activities. Yet, it can create difficulty for schedulers who are trying to arrange a reasonable course schedule in the middle of the day.

  While having this time set aside in blocks for faculty to convene weekly may be necessary, it would be better to move these "no-course time blocks" to midafternoon where they would function equally well for their intended faculty purpose and not significantly impact the regular scheduling calendar.

Table 3: Percentage of Rooms in Use in Scheduled Classrooms by Hour of the Day and Day of the Week, Fall 2012



Source: Ira Fink and Associates, Inc.

3. Course Management Decisions

- **Scheduled courses are canceled without a plan for filling empty classrooms.** At two campuses we studied, a high percentage of courses were scheduled and then canceled during the first two weeks of instruction because of low or no enrollment. At one campus, 8 percent, or 1 in 16 scheduled courses, were canceled. At another campus, 12 percent, or 1 in 8 courses, were canceled.

  Because these classes had been scheduled and rooms assigned, it was difficult to find a last-minute substitute course to use for the suddenly empty classrooms. This problem contributes to lower aggregate room utilization. One remedy is to leave some courses without room assignments prior to the start of the academic term following review of the historical record to identify types of courses that are likely to be canceled. For these potentially high-cancellation courses, their room assignments would be TBD (to be determined).

- **Departmentally scheduled courses.** In general, class laboratories are assigned to departments because these rooms contain course specific furniture and equipment and they are also a source of departmental pride. It is a generally accepted practice that departments schedule the use of their assigned class laboratories and coordinate their use with the registrar.

  By comparison, departmentally scheduled classrooms are another matter. Because these departmentally scheduled classrooms are also likely to be in close proximity to other department facilities, scheduling and using these classrooms benefits the department. At the same time, these rooms are probably no different than other registrar-controlled classrooms scheduled on a campus-wide basis. Because of their lower use, at a minimum, departmentally held classrooms should be centrally scheduled during peak time and then revert to departmental control at other times.

3. Classroom Management Decisions

At many campuses, the registrar is responsible for assigning courses to classrooms. At the same time, there may be no unit or division with responsibility for classroom management, including classroom modernization, classroom fittings, classroom comfort, and classroom maintenance. Because general-assignment classrooms usually have no "owner," their important functional needs often have no champion within the campus governance structure. This can mean general-assignment classrooms limp along from year to year or even from student generation to generation without attention to their condition or needs.

- **Comfort:** Providing a comfortable teaching environment extends beyond the furniture. Environment includes the temperature of a room (either hot or cold), the lighting, the wall surfaces, etc. Since the users of a room are generally unable to modify its environmental conditions, instructional spaces should be constructed with individual environmental controls, rather than using grouped or otherwise common zoned environmental conditions in a series of rooms. Campuses should establish a classroom improvement committee to identify needs, set priorities, and seek funding for these energy-conserving measures.

- **Technology:** In just a few years, technology, in all of its forms, has become one of the most important factors in changing higher education instruction. While it is assumed that campuses have a technology plan for instructional space, not all do. At a minimum, each campus should identify the base level of technology in all rooms and the extended level

of technology in a number of rooms. The technology needs should be listed in an instructional-space upgrade plan and then addressed.

IDEAS FOR IMPROVING USE AND UTILIZATION

There are a number of actions a campus can take to improve classroom and class laboratory utilization. Many of these require management or administrative actions related to course and room scheduling and management. They include:

1. **Put someone in charge of classrooms.** Appoint a director, create an office, or restructure decentralized scheduling activities so an identified classroom resources activity and its director are known and responsible.
2. **Analyze classrooms beyond their use and utilization.** Conduct a physical-condition and deferred-maintenance audit of the classroom space. Identify technology standards for classrooms. Measure how well classrooms match up to campus technology requirements.
3. **Create a website identifying and illustrating every classroom.** Providing photos and details of the characteristics of the campus classrooms on a website will allow faculty to have an opportunity to identify the type of room that would best suit their instructional needs.
4. **Work with faculty to understand how instruction is changing and what is required.** Pedagogical change and active learning may require changing furniture from tablet arms to tables, shifting how surfaces are arranged around the room, or simply giving faculty a podium from which to use their laptop for instruction.
5. **Revisit the assignment of departmentally controlled classrooms.** It may be best for a campus to recentralize control of departmentally controlled classrooms throughout the day or, at a minimum, during an extended lunch hour peak time from 11:00 a.m. to 1:00 or 2:00 p.m., when the classrooms revert from departmental assignment to campus assignment. Typically, departmentally scheduled classrooms have lower use and utilization than do centrally scheduled classrooms.
6. **Establish scheduling time blocks that reflect how campus courses are actually taught and classrooms are utilized.** Some campuses may need to revisit their existing scheduling blocks that are based on a template of the standard three-day-per-week, one-hour time blocks and two-day-per-week, one-and-one-half-hour time blocks, and replace that established template with a new one.

CONCLUSION

Classroom utilization metrics and results should become a foundation for campuses that are concerned about the effective use of their classroom spaces. The focus of utilization studies should be more than simply identifying how well the rooms are measuring up compared to a campus goal or requirement. Utilization studies should also provide a vehicle for finding out about the usefulness of the classroom inventory.

Left to themselves, classrooms have no voice, no spokesperson, and no advocates for improvement or increased use. Regardless of how well they are used, classrooms are and will continue to be central to delivering instruction in higher education; they will also age. If there is a mismatch on the campus between campus classroom supply and demand, as is shown in the utilization studies, this can be corrected. If the classrooms are aged and antiquated, this should be a wake-up call that the campus needs to do more and do better with this important resource.

ENDNOTES

1 Ira Fink, "Classroom Use and Utilization" *Facilities Manager,* Vol. 18, No. 3 (May/June 2002), pp. 13-24; Ira Fink, "Class Laboratories: Space Use and Utilization," *Facilities Manager,* Vol. 19, No. 6 (November/December 2003), pp. 17-27.

2 Elena Silva, Taylor White, and Thomas Toch, *The Carnegie Unit: A Century-Old Standard in a Changing Education Landscape* (Stanford, CA: Carnegie Foundation for the Advancement of Teaching, January 2015). https://www.carnegiefoundation.org/wp-content/uploads/2015/01/Carnegie_Unit_ Report.pdf. (accessed October 30, 2016)

3 *Report of the Committee Appointed by Dr. William L. Ettinger, Superintendent of Schools, to Make a Survey of the Junior High Schools of the City of New York* (New York: New York Superintendent of Schools, 1924).

4 Paul C. Packer, Ph.D., *Housing of High School Programs* (New York: Teachers College, Columbia University, 1924).

5 Monroe E. Deutsch, Aubrey A. Douglass, and George D. Strayer, *A Report of a Survey of the Needs of California in Higher Education* (Berkeley: University of California Press, 1948), p. 128.

George Strayer, the principal author of that study, was also a participant in the earlier 1920 studies in New York City. Thus, the spatial concepts and metrics developed in the mid-1920s in junior and senior high schools in New York City may have been the genesis of space use and utilization criteria that were established in California higher education and eventually nationwide.

6 Thomas R. McConnell, *A Restudy of the Needs of California in Higher Education* (Sacramento: California State Department of Education, 1955).

The *Restudy* report standard was based on a room availability of 45 hours per week and a usage of 36 hours, or 80 percent of the time. Of the seats in a room, 67 percent were to be occupied.

7 Franklin G. Matsler, *Space and Utilization Standards, California Public Higher Education: A Report to the Coordinating Council for Higher*

Education (Sacramento: Coordinating Council for Higher Education (CCHE), September 1966).

The CCHE standard was based on a 45-hour week for room availability and a usage of 34 hours per week, or 75 percent of the time. Seat or station occupancy was set at 66 percent.

8 Legislative Analyst's Office, "Higher Education: Flexible Facility Utilization Standards" (Sacramento: Legislative Analysis Office, 2003). http://www.lao.ca.gov/2003/flexible_facility/flexible_ facility.html.

9 Based on these metrics, the State of California expects the public higher education systems to schedule courses and put rooms to use an average of 52.5 hours per week, per classroom, as shown in Table 1. During these scheduled hours, it is expected that two-thirds (66.7 percent) of the stations in the rooms will be occupied. The result is occupancy metric of 35 weekly student contact hours per station (52.5 hours × 66.7 percent = 35 hours) for classrooms.

For class laboratories, the calculations follow a similar set of metrics based on averaging the two class laboratory standards shown in Table 1, one of 23.4 hours of station occupancy for lower division courses and the second of 17.6 hours of class laboratory use per week for upper division resulting in 20 hours per week expected utilization of class (teaching) laboratories.

10 *Classroom and Teaching Lab Utilization Report* (Sacramento: University of California Capital Programs, October 2015). http://www.ucop.edu/operating-budget/_files/legreports/15-16/UCClassroomTeachingLabUtilizationRptwithAppendicesFall2014.pdf.

These utilization metrics are among the highest in the nation. Biennial reports from UC and the CSU, in the most recent analysis, show most of the UC general campuses all exceed the metrics and range in utilization of both classrooms and teaching laboratories.

11 *Fall 2013 Classroom and Teaching Laboratory Utilization Report, California State University* (Long Beach, CA: The California State University, Office of the Chancellor, September 2014). https://www.calstate.edu/budget/fybudget/legislative-reports/1415-LAO-Utilization-Facilities-Student-Space-Report.pdf.

12 University of Iowa, *Scheduling Regulations & Departmental Allocations.* http://www.classrooms.uiowa.edu/LinkClick.aspx?fileticket=YAhZiUxUtCI%3d&tabid=113.

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