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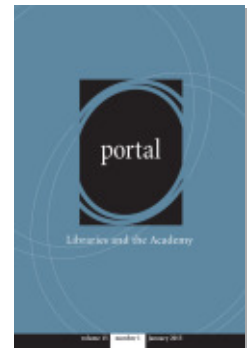
Learning Behaviors and Learning Spaces

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Learning Behaviors and Learning Spaces

Scott Bennett

abstract: What specific learning behaviors are important to students and faculty members? Does the campus provide spaces that foster these behaviors? Where are those spaces? Asking these three questions at six colleges and universities reveals notable differences in the ways students and faculty members answer them. Student and faculty member answers also reveal how narrowly and unevenly their institutions provide supportive learning spaces beyond the classroom. Their answers suggest a fundamental misalignment between learning behaviors identified as important and the campus spaces that can be a chief asset or a serious liability in achieving institutional mission.

In a recent conversation, a faculty member observed that “the entire campus is a learning space.” This assertion is hard to dispute, but its truth is equally hard to demonstrate.

It is surely desirable that the entire campus serve institutional mission by being a learning space, but when one looks at much of non-classroom campus space, its design is more likely to respond to the concerns of service providers—in residence and dining halls and in computer laboratories—than to the needs of students as learners. This has been demonstrably the case in libraries. When asked what they needed to understand in a systematic way in order to succeed, 85 percent of library directors responsible for library renovation and construction projects between 1992 and 2001 responded by referring to their own library operations, whereas only 41 percent identified understanding modes of student learning as critical to success. And it became evident in follow up interviews with those who affirmed the need to understand how students learn that they meant little more than surveying student preferences regarding furniture and group study space.¹

This essay describes an attempt to get beyond the unchallengeable but unverifiable platitude and to measure how campus spaces distinctively foster learning.² It does that by defining the kind of learning—intentional learning—that should be characteristic of non-classroom spaces and by identifying a set of twelve specific learning behaviors that manifest such learning. Most of these behaviors are drawn from the National Survey of Student Engagement (NSSE).³ Three questions were put to students and to faculty



members at six institutions regarding each of these behaviors. The first question asked which of the twelve learning behaviors is personally important to the respondent. The second asked whether the respondent feels the campus provides space that supports the learning behaviors important to him or her. The third asked respondents to identify, from a list, these supportive learning spaces.

Intentional learning

It is impossible to measure how effective non-classroom spaces are as learning spaces without defining the kind of learning one hopes to see in these spaces.

This essay holds that college and university learning properly starts in the instructor-controlled classroom, but it focuses on behaviors and spaces that figure most powerfully in the transformational shift that occurs later, when students move beyond the classroom environment and take responsibility for and control over their own learning.⁴ Scholars describe this transformative learning activity in a number of ways. Phil Race puts the individual's wanting to learn at the center of a set of five interacting factors that underpin successful learning.⁵ The editors of the landmark *How People Learn* use the term metacognition to designate a set of activities through which a person becomes a self-conscious and self-regulating learner. These activities include "the ability to orchestrate one's learning: to plan, monitor success, and correct errors when appropriate—all necessary for effective intentional learning."⁶ The term *intentional learning* is perhaps most widely used.⁷ The account of intentional learning by Carl Bereiter and Marlene Scardamalia is particularly instructive. They use the term to refer to "cognitive processes that have learning as [an intrinsic] goal rather than an incidental outcome." They describe how all too often learning instead remains process-driven and degenerates into schoolwork. Speaking of primary school students, they argue:

The work that characterizes classroom life may have originally been conceived with learning goals in mind, and it may even achieve some learning objectives, but from the standpoint of students, doing schoolwork is what school is about. It is their job, not attaining learning goals....We could find nothing in [children's talk about their classrooms] ... to suggest that the children thought of themselves as learnersBy interpreting learning activities as jobs to be done, students not only concretize them but assimilate them to the rich knowledge structure that surrounds work in industrialized societies. Even young children know something about what it means to have a job, to be a good worker, to take pride in a job well done, and so on. All this knowledge can immediately be brought to bear on schoolwork, making what might otherwise be an incomprehensible enterprise something easy to understand and adjust to. The drawback, however, is that schoolwork rather than learning becomes the object of effort.

To escape the trap of schoolwork, Bereiter and Scardamalia assert that "students need to direct mental effort to goals over and above those implicit in the school activities." These goals include building a problem-solving framework for approaching learning, taking responsibility for high-level skills normally exercised by the teacher, setting personally meaningful learning goals that subsume (and therefore satisfy) externally imposed schoolwork goals, and self-assessing their own success in learning.⁸ To act successfully on such goals is to become an autonomous learner.⁹

To specify further the behaviors characteristic of autonomous or intentional learning, I identified a set of twelve learning behaviors (listed in Attachment 1), ten of which are drawn from NSSE. These behaviors typically happen outside of the classroom and can reasonably be taken as behaviors by which students orchestrate their own learning, take responsibility for high-level skills, set personally meaning learning goals, and assess their own success in learning.¹⁰

Where do the specific learning behaviors that constitute intentional learning happen? While it is commonly observed that much or indeed most learning happens outside of the classroom, many faculty members will respond with only puzzled looks when they are asked where their students actually study. And most colleges and universities have not been particularly intentional about designing anything but classrooms, studios, and laboratories as learning spaces.¹¹

Where do the specific learning behaviors that constitute intentional learning happen?

The learning behaviors and learning spaces questionnaires described in this essay can help academic planners reduce puzzlement and become more intentional about the design of campus learning spaces. The questionnaires identify the learning behaviors that are actually important to students and faculty members as features of intentional learning.¹² And by using the list of campus learning spaces detailed in Attachment 2, the questionnaires enable one to draw a map of non-classroom campus spaces that distinctively foster the learning behaviors students and faculty members identify as important. The questionnaires reveal significant differences between student and faculty views both on the learning behaviors they regard as important and on the spaces they feel support these behaviors. Surely academic planning should be informed by these views. I am aware of no other instruments available to planners for doing this.

Questionnaire administration and respondent demographics

This essay reports on six institutions that have used the learning behaviors and learning spaces questionnaires, the first in 2006, two more in 2008, and three in 2009. The questionnaires were developed as a research project and have changed over time, as evident in the move from ten learning behaviors in 2006 to twelve in 2008. Each institution received instructions for administering the questionnaires; all questionnaire responses were collected and reported anonymously. Each institution understood that data collected on its campus would appear, anonymously, in this essay.¹³

The six institutions included three liberal arts colleges and universities, two universities that offer several professional programs and some graduate instruction, and a university focused primarily on science and technology (for more details, see Figure 1 under the Learning Behaviors & Learning Spaces tab of the author's website, www.libraryspaceplanning.com). The six include both independent and public institutions, and they vary considerably in size, from some 900 students to over 27,000 students. While these six institutions can be taken to represent only themselves, it appears that different institutions yield quite dissimilar survey responses.



In administering the questionnaires, none of six institutions sampled either the student body or faculty members. Instead, each asked all students (or at least all undergraduate students) and all faculty members (or at least all tenure track faculty members) to respond to the questionnaires. Figures 2 and 3 (available at the author's website) set out demographic information about the student and faculty respondents at the six institutions in detail. Data categories are not uniform for all institutions because some wanted different information and because the questionnaires changed over time. Where a comparison is possible between the respondents to the questionnaires and the entire population of an institution's students or faculty members, there is sometimes a rough parallel between the two.¹⁴ The most salient demographic fact is, however, that response rates to the questionnaires were generally low. Among students, the response rate ranged from 2 percent to 14 percent (with a median of 10 percent), whereas among faculty members the response rate ranged from 5 percent to 58 percent (with a median of 33 percent). In these circumstances, survey data cannot be taken to represent the views of all of an institution's students or faculty members.¹⁵ To keep this limitation in mind, the terms "student respondents" and "faculty respondents" are used throughout this essay, rather than "students" and "faculty."

Preliminary observations about the findings

The surveys generated too large a body of data for it all to be reported here. For that reason, complete data are made available under the Learning Behaviors & Learning Spaces tab of the author's website. For instance, complete student and faculty member responses to Questions 1, 2, and 3 are available only there, presented in Tables 1a/b, 2a/b, 3, and Data Sets 1a/b through 6a/b respectively. In considering these data, it is important to remember that respondents frequently did not answer about all twelve learning behaviors. Moreover, only respondents who answered that a particular learning behavior is personally important were then asked whether the campus provides space that fosters that behavior. And only those who answered this second question affirmatively were then asked the third question about specific spaces that are supportive of intentional learning.

Among the six institutions, a median of 98 percent of student respondents answered regarding learning behavior #1, whereas a median of 75 percent of student respondents answered about learning behavior #12. Median faculty respondents over the twelve questions ranged from 97 percent to 84 percent. No data are available to indicate whether this attrition is comparable to attrition in other questionnaires at these institutions.¹⁶

Findings regarding learning behaviors (Survey Question 1)

Which learning behaviors are important to student and faculty respondents (Question 1), and how well do student and faculty respondents agree with one another when identifying important learning behaviors?

To achieve some useful focus in dealing with Question 1, this essay attends only to the learning behaviors identified as important or very important by 67 percent or more of students or faculty respondents ("super majorities") and to those identified as important

or very important by 51 percent to 66 percent of student or faculty respondents (“simple majorities”). These two percentage ranges are used as *prima facie* thresholds of importance, the first regarded as “clearly important” and the second as “possibly important.” No other claim is made for the validity for these thresholds; different investigators might well choose different thresholds.

Two views of the responses to Question 1 are instructive. CHART 1 (or Figure 4 at the author’s website) presents the first of these. It draws on data from the website Tables 1a/b to compare the overall number of learning behaviors student or faculty respondents at the six institutions identified as important or very important. So, for instance, student respondents at College B identified seven learning behaviors as “clearly important,” as defined above, whereas faculty respondents there identified five.

Viewed this way, it appears that both student and faculty respondents at College B and at University F were in some accord in regarding a large number of non-classroom learning behaviors as clearly or possibly important. There was much less agreement between student and faculty respondents at the four other institutions, where faculty respondents consistently identified more learning behaviors as important than did student respondents. This is true both of the “clearly important” numbers and of the totals.

CHART 2 (or Figure 5 at the author’s website) reconfigures the data to state the number of institutions where 67 percent or more of student or faculty respondents (i.e., “super majorities”) or, alternatively, between 51 percent and 66 percent of respondents (i.e., “simple majorities”) identified a given learning behavior as important or very important. So, for instance, at three institutions super majorities of student respondents identified learning behavior #5 as important or very important, whereas at five institutions simple majorities of faculty respondents identified #5 as an important learning behavior.

Viewed in this way, and focusing only on the learning behaviors identified as important by super majorities of either student or faculty respondents, it appears that across the six institutions

- student and faculty respondents saw collaborative study (learning behavior #1) as important at only two and one institutions, respectively; by contrast, both student and faculty respondents agreed in seeing studying alone (#2) as important at all five institutions where this learning behavior was considered;
- student respondents saw studying along (#3) as important at more institutions than did faculty respondents;
- faculty respondents saw a set of peer-to-peer learning behaviors—discussions of class material among other students (#4) and discussions with others who differ in values (#8) and in ethnicity (#9)—as important at decisively more institutions than did student respondents;
- student respondents saw discussions of class material with faculty members outside of class (#5) as important at more institutions than did faculty respondents;
- faculty respondents saw culminating senior experiences (#11) as important at decisively more institutions than did student respondents; and
- student and faculty respondents at only one or two institutions identified a further set of student-faculty member interactions outside of the classroom (#6, 7, and 10) as important.

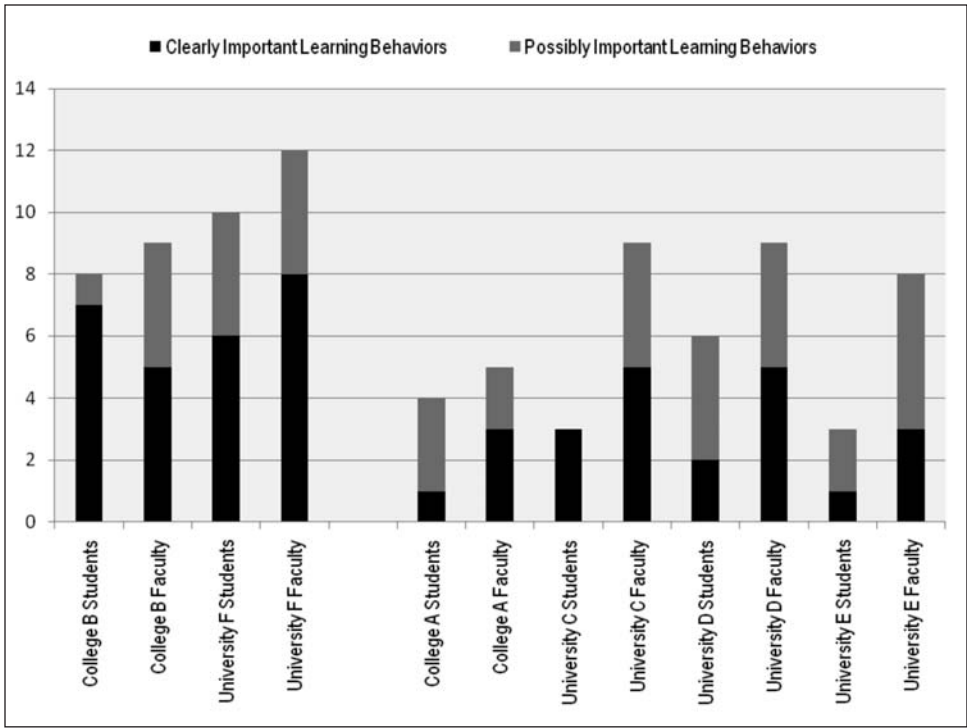


CHART 1. Number of Learning Behaviors Identified as Clearly or Possibly Important

There was little agreement between student and faculty respondents or from institution to institution about the importance of other intentional learning behaviors.

Responses to Question 1 suggest that at most of the six institutions, student respondents took a narrower view than did faculty respondents of the learning behaviors that are important. And as regards specific learning behaviors, there was a broadly shared sense of the importance only of studying alone (learning behavior #2)—surely the “default” learning behavior in North America. Otherwise, there was little agreement between student and faculty respondents or from institution to institution about the importance of other

intentional learning behaviors (especially notably as regards # 5 and 11), except for a disinclination to value some student-faculty member interactions outside the classroom (#6, 7, and 10).

Any wish to invest in spaces that support learning behaviors identified as important by students and faculty members will be frustrated by this welter of opinion. One might indeed conclude from these data that the first task before those directing such investment should be to understand the likely differences between student and faculty member views about the importance of specific learning behaviors and then to develop an institutional view of the learning behaviors that are critically important to campus

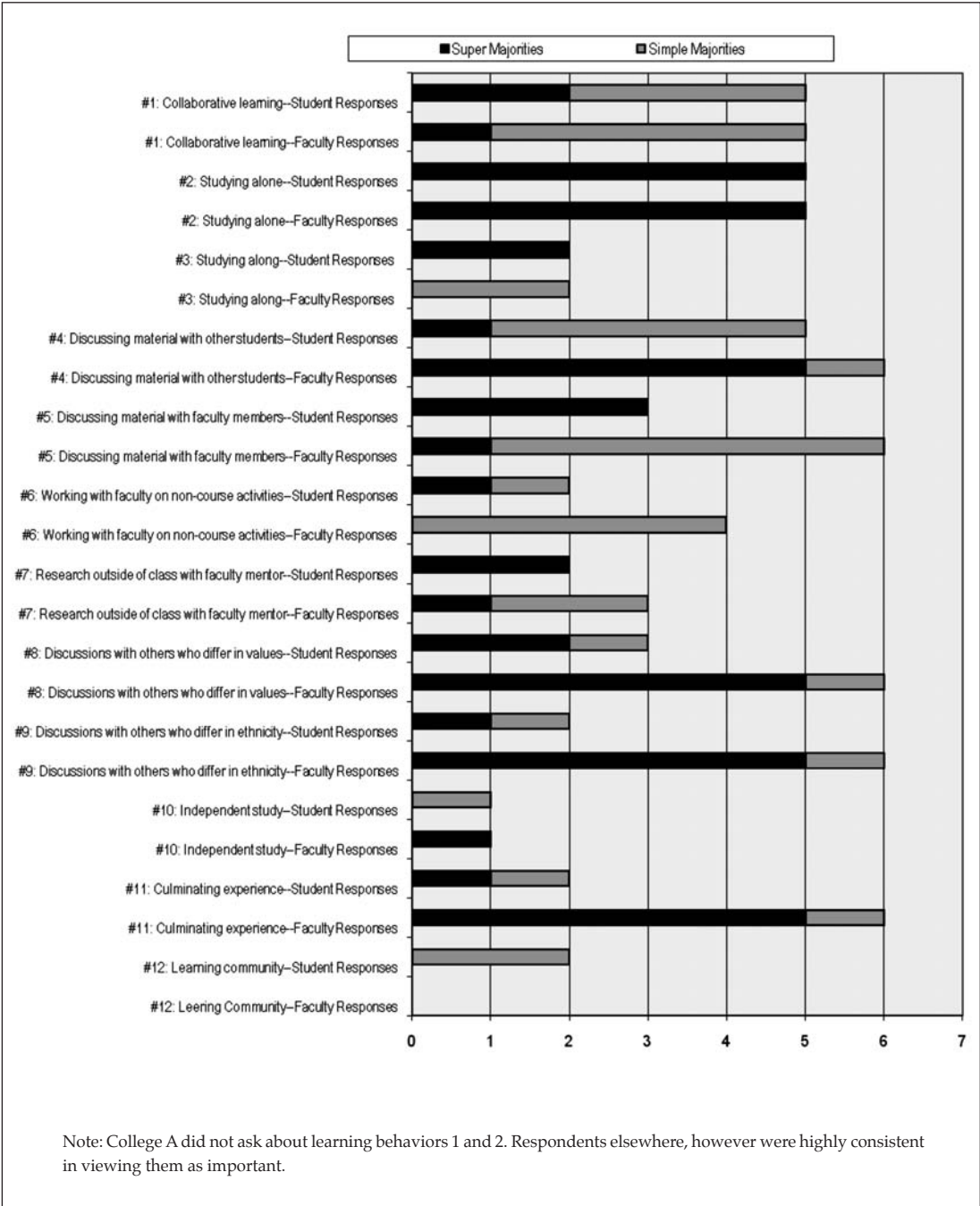


CHART 2. Number of Institutions Identifying Given Learning Behaviors as Important or Very Important



mission—and, for that reason, worth targeted investment of capital resources. Developing and winning support for such a view is no small task, but absent such an understanding and the priority-setting that follows from it, an institution may not get full value from its investment in spaces for intentional learning.

Findings regarding supportive learning spaces (Survey Question 2)

How well, in the view of student and faculty respondents, do these six institutions provide space that fosters learning behaviors important to them (Question 2)? How well do student and faculty respondents agree in these judgments?

Two approaches to answering these questions are developed here. The first looks at each of the learning behaviors. In CHART 3 (or Figure 6 at the author's website), student and faculty responses to Question 2 are arrayed in three categories: "supportive," "indeterminate," and "deficient." Campus space is regarded as "supportive" when 67 percent or more of those answering Question 2 responded in the affirmative (i.e., answered with either "very well" or "adequately"). Campus space is regarded as "deficient" when 50 percent or fewer of those answering Question 2 responded in the affirmative. Cases where affirmative responses ranged between 51 percent and 66 percent are regarded as "indeterminate." These three categories are used as *prima facie* thresholds of meaning. No other claim is made for the validity for these thresholds; different investigators might well choose different thresholds. In reading CHART 3, consider that as regards collaborative learning (learning behavior #1), student respondents at five institutions felt their campus provides space that is "supportive," whereas students at one of the institutions rated campus space as "deficient," as these terms are here defined. By contrast, faculty respondents at only one institution felt that campus space is "supportive" of collaborative learning, whereas elsewhere faculty respondents felt campus space to be either "indeterminate" (one institution) or "deficient" (four institutions).

In this view, students at four institutions saw campus space as supportive of studying alone (learning behavior #2), which is quite different from the faculty respondents who, at only two institutions, saw campus space as supporting this learning behavior. Student respondents at three or more institutions saw campus space as supporting three learning behaviors involving other students (learning behaviors #1, 3–4). By contrast, faculty respondents at two institutions saw campus space as deficient for one of these peer-to-peer behaviors (#3), while faculty respondents at four institutions saw campus space as deficient for the other two (#1 and 4). Student and faculty respondents at no more than two institutions saw campus space as supportive of a set of learning behaviors involving student-faculty interaction (# 6, 7, 10, 11, 12); the same is true of learning behavior #5, except that in this case faculty (but not student) respondents at four institutions saw campus space as supportive of discussions of class material with faculty members outside of class.

A second view configures Question 2 data not by individual learning behaviors but by institution. Specifically, CHART 4 (or Figure 7 at the author's website) registers the total number of learning behaviors that were *both* identified in Question 1 as important by super majorities of respondents *and* judged in Question 2 to be fostered by existing campus space either very well or adequately. These numbers are arrayed in the three

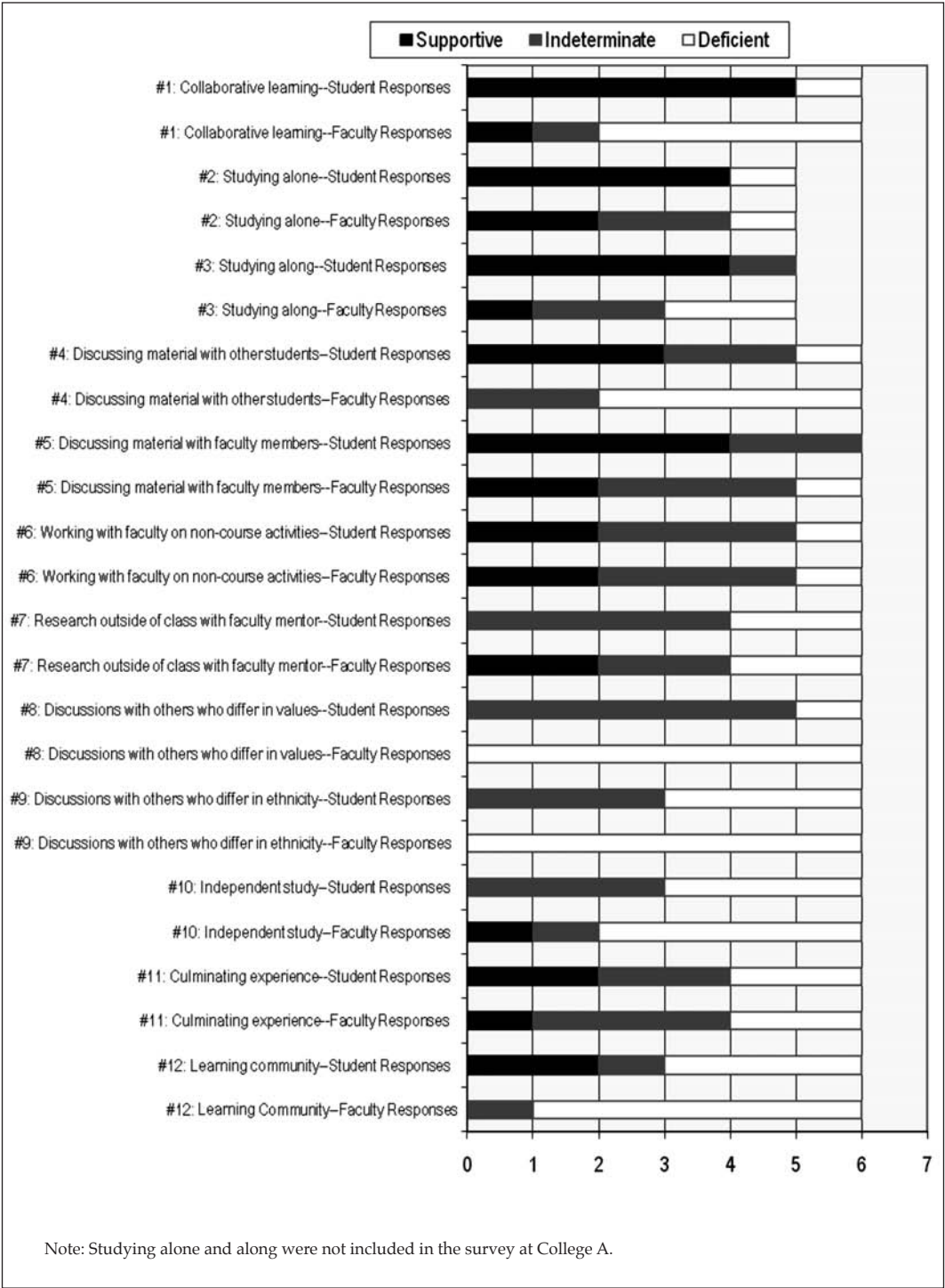


CHART 3: Number of Institutions where Space is Seen as Supporting Given Learning Behaviors



categories used in CHART 3. This view provides some generalized measure of how well campus space supports important learning behaviors at a given institution.

In reading CHART 4, consider that in Question 1 a super majority of student respondents at College B identified seven learning behaviors as important to them. Their responses to Question 2 indicated that campus space is “supportive” of six of these learning behaviors and “indeterminate” for the seventh, as these terms are defined here. By contrast, a super majority of faculty respondents at College B identified five learning behaviors as important in Question 1, but their responses to Question 2 indicated that campus space is supportive of only one of these and indeterminate or deficient for two each.

Student and faculty respondents at College B clearly differed in their judgments, with student respondents much more often positive than faculty respondents about how well campus space, taken as a whole, supports the learning behaviors important to them.

Viewed in this way, Question 2 data suggest that student respondents at institutions B, D, and E felt that campus space supports the learning behaviors important to them. This positive view pertained, however, to relatively limited sets of learning behaviors—ranging from six to one learning behaviors important to super majorities of student respondents. Faculty

respondents, by contrast, viewed a somewhat larger set of learning behaviors as important, especially at Universities C, D, and E, but felt more often than not that campus space is indeterminate or deficient in supporting those behaviors.

At University F, by contrast,

While one wants to believe the entire campus serves as learning space, the evidence of these six institutions suggests we might feel considerable uncertainty about how often students and faculty respondents see their space as actually functioning in this way.

student and faculty respondents were strongly aligned in judging campus space as largely deficient in the support of a large set of important learning behaviors.

While one wants to believe the entire campus serves as learning space, the evidence of these six institutions suggests we might feel considerable uncertainty about how often students and faculty respondents see their space as actually functioning in this way or—more specifically—as serving to foster the intentional learning behaviors that are most important to them.

Findings regarding the location of supportive learning spaces (Survey Question 3)

Where *are* the spaces that foster learning behaviors important to student and classroom faculty respondents? The answers to Question 2, just considered, support generalizations about the entire campus. Question 3 takes the measure of specific campus locations as spaces for intentional learning.

Respondents who answered Question 2 affirmatively were given, in Question 3, a set of ten specific non-classroom spaces (listed in Attachment 2) to use in identifying the

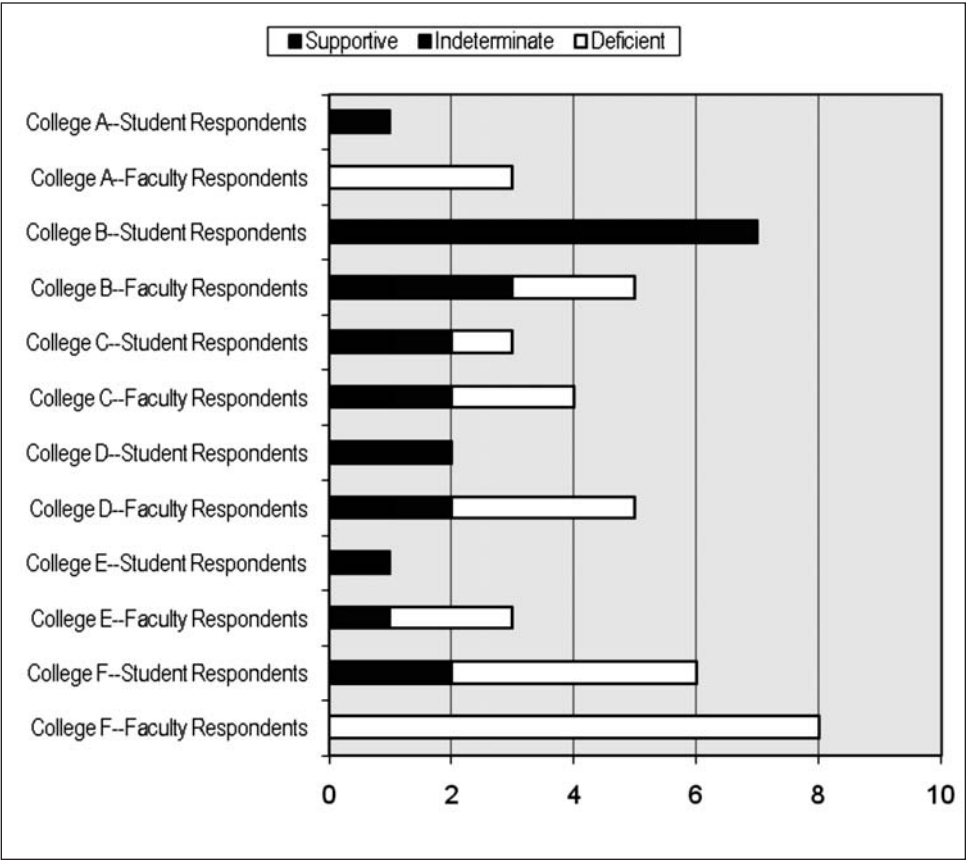


CHART 4: Number of Important Learning Behaviors Seen as Supported (or not) by Campus Space by Super Majorities of Respondents

specific spaces they regard as supporting a given learning behavior.¹⁷ Normally, there were multiple affirmative responses (i.e., multiple spaces) for each learning behavior.¹⁸ Three data points are reported for the intersection of each learning behavior and each learning space. The first is the number of affirmative responses for a given learning behavior and a given space (e.g., at University F, students responded affirmatively 129 times regarding learning behavior #1 and the student union). The second reports these affirmative responses as a percentage of all of the affirmative responses for the given learning behavior across all campus spaces (i.e., the 129 affirmative responses for learning behavior #1 and the student union represent 21 percent of the total of 608 affirmative responses for learning behavior #1 and all learning spaces among student respondents at University F).

The third data point is the z score for the intersection of each learning behavior and each learning space. This is a statistical measure of how many standard deviations a given finding is from the mean of all of the findings in the data set. Scores of 2.00 or greater are commonly regarded as statistically significant (i.e., unlikely to occur by



chance).¹⁹ So for instance, student responses at University F indicating that the student union is a supportive space for studying collaboratively (learning behavior #1) have a *z* score of 2.63 and constitute a statistically significant finding. Such data are available for both student and faculty respondents at all six institutions.²⁰ The vast majority of these *z* scores are not statistically significant, as one would expect in normal distributions.²¹

To make sense of this mass of data, CHART 5 (or Figure 8, developed from Data Sets 1a/b through 6a/b at the author's website) focuses on data only for those learning spaces with a positive *z* score of 2.00 or more for one or another learning behavior. Arguably, only these spaces can be thought to foster the learning behavior in question for some reason other than chance.²² So, for instance, at College B both student and faculty respondents identified residence halls as providing a supportive environment for studying alone (learning behavior #2) in statistically significant numbers (represented by *z* scores of 3.29 and 2.95 respectively). Also at College B, student respondents identified the library and computer laboratories as supporting studying alone (*z* scores = 4.52 and 2.52 respectively). Student (but not faculty) respondents identified the library as supporting collaborative learning (learning behavior #1; *z* score = 3.29), which was the only campus space at College B identified as supporting this learning behavior in statistically significant numbers.²³ The last two columns in CHART 5 state the total number of times student or faculty respondents identified a given space as supportive of one or more learning behavior. So, for instance, student respondents identified residence halls as supportive five times (three times for learning behavior #2 and once each for learning behaviors #4 and #8).

CHART 5 indicates that both student and faculty respondents most frequently regarded libraries as fostering learning behaviors important to them. It is striking that student respondents affirmed the value of library space almost twice as frequently as did faculty respondents. Even more striking is the fact that no other campus space comes even close to the library in the frequency of affirmative student responses. That said, it is also notable that student respondents identified relatively scarce commons spaces in academic buildings as supporting important learning behaviors somewhat more often than more commonly available residence halls or computer laboratories. Faculty respondents matched student responses in four cases (i.e., the student union, commons spaces in academic buildings, outdoor spaces, and information/learning commons); but their number of statistically significant scores lagged somewhat behind the student number in two cases (i.e., residence halls, dining halls) and was in advance of the student number in one case (i.e., computer laboratories).²⁴

The *z* scores in CHART 5 are all statistically significant, but scores of ≥ 3 are particularly noteworthy because they are quite unlikely to occur by chance. They indicate a statistically extraordinary number of respondents judge a given space to be supportive of important learning behaviors. This view of the data underscores the importance of libraries, with well over half of student and faculty respondents (8 of 13 and 5 of 7, respectively) ranking the library as supportive in numbers with *z* scores of ≥ 3 . Notably, the library has all but two of the *z* scores of ≥ 4 (including both of the *z* scores of ≥ 5). No other campus space comes even close to the library by this measure.

The picture that emerges from CHART 5 is of a narrow range of campus spaces beyond the library supporting a narrow range of learning behaviors beyond studying



	College A		College B		University C		University D		University E		University F		Total	
	Student	Faculty	Student	Faculty	Student	Faculty	Student	Faculty	Student	Faculty	Student	Faculty	Student	Faculty
Residence halls (Note 1)														
#2: Studying alone	NA		3.29	2.95	3.07		2.23	3.02					5	3
#3: Studying along	NA													
#4: Discussing material with other students	2.87			2.10										
#6: Discussions with others who differ in values	2.29													
Dining halls														
#2: Studying alone	NA	NA												
#3: Studying along	NA	NA											2	0
#5: Discussing material with faculty members			3.19											
#6: Discussions with others who differ in values			2.10											
Student union														
#1: Collaborative learning	2.29										2.63			
#2: Studying alone	NA	NA												
#3: Studying along	NA	NA											2	2
#5: Discussing material with faculty members		2.65												
#6: Discussions with others who differ in values											2.01			
Commons spaces in academic buildings														
#1: Collaborative learning	2.87													
#2: Studying alone	NA	NA												
#3: Studying along	NA	NA											6	6
#4: Discussing material with other students	2.00	2.10												
#11: Culminating experience											2.92			
Outdoor spaces														
#2: Studying alone	NA	NA					2.36	2.19						
#3: Studying along	NA	NA											2	2
#4: Discussing material with other students	2.00													
#6: Discussing material with faculty members		2.92												
Libraries														
#1: Collaborative learning	3.17		3.29				2.57		2.24		3.46			
#2: Studying alone	NA	NA	4.52	4.24			5.26	4.15	5.33		4.23			
#3: Studying along	NA	NA	2.37		3.25						2.84		13	7
#4: Discussing material with other students	2.00													
#11: Culminating experience				3.38							2.92			
Computer laboratories														
#2: Studying alone	NA	NA	2.52	3.17			2.91	4.21	3.28		2.01		4	6
#3: Studying along	NA	NA												
#11: Culminating experience											2.01			
Information/Learning commons (Note 2)														
#2: Studying alone	NA	NA							2.28				1	1
#3: Studying along	NA	NA												

NOTES: (1) Universities E and F are primarily non-residential. (2) Colleges A and B and Universities D and F do not have a learning/information commons.

CHART 5: Statistically Significant Z Scores for Spaces that Distinctively Foster Learning Behaviors (by Institution)



alone. The force of this picture of a near mono-culture of learning and space might be more clearly felt by imagining alternative results—what the data might look like if, in the words of the faculty member quoted at the outset of this essay, the entire campus were a learning space. One might, for instance, see residence halls, the dining halls, and the student union figuring prominently in the support of collaborative learning, of discussions of class material with other students, and of diversity-based learning (learning behaviors #1, 4, 8, and 9). But they do not. One might also see the dining halls, commons spaces in academic buildings, libraries, and computer laboratories as prominent in the support of student-faculty interaction outside of the classroom (learning behaviors #5–7, 10–11). But they are not. Other “what might be” views are possible. Given the amount of time students spend in their residence halls (and the level of campus investment represented by these spaces), one might think it imperative that these spaces function better and for a wider range of learning behaviors than they do at the four of these six institutions that have residence halls.²⁵ Or one might feel that common spaces in academic buildings represent a vastly underutilized resource, especially for student-faculty interactions outside of the classroom. Finally, one might feel that the near singularity of good campus space for studying alone (learning behavior #2) ill-accords with the relatively large number of learning behaviors identified as important, especially by faculty respondents (CHARTS 1 and 2, above).

By all of these measures of both actual and imagined results, investments in campus space at these six institutions must surely be seen as underperforming with regard to intentional learning and institutional mission.

The case for all campus spaces being learning spaces

The picture just drawn of campus learning spaces belies the situation in one important way. While few campus spaces emerged as supporting important learning behaviors in statistically significant ways, it is nonetheless true that *some* student and faculty respondents identified every one of the campus spaces *some* of the time for *some* learning behaviors. That is to say, there were *some* affirmative responses to virtually every question asked. So, for instance, 53 student respondents at University F responded affirmatively as regards the dining hall and collaborative learning (learning behavior #1). That this is not a statistically significant number of responses (z score = 0.37) does not change the fact that the dining hall did actually account for about 9 percent of all affirmative responses regarding collaborative learning.

How might this fact mesh with the argument just advanced that most non-classroom spaces at the colleges and universities studied here are an underperforming asset as regards the learning mission of these institutions?

The vast majority of student and faculty responses evince what might be called a “uniform” rather than a “distinctive” view of campus space as learning space. That is, the views expressed of campus spaces by student and faculty respondents were most often uniform (i.e., indistinguishable one from the other as regards statistical significance, with z scores ranging from -1.99 to +1.99) except in the comparatively few cases detailed in Section 6, above, where their views are distinctive (i.e., with z scores of ≥ 2). So one may rightly say—echoing, in a way, the faculty member mentioned at the outset of this



essay—that any of the spaces with a z scores between -1.99 and +1.99 is as supportive of learning as any other.

But this conclusion from the observed uniformity of opinion drives the question of whether it can be said that these spaces are effectively *designed* for learning. That is, can one credibly say that a space is designed for learning when it fosters studying alone as well as it fosters discussing material with faculty members or collaborative study? If one answers this in the negative, as I believe one must, one is left to consider whether space design that is not consciously motivated by a concern with intentional learning or does not distinctively foster such learning is appropriate for investments in non-classroom campus space. This is, surely, a key question for those charged with campus planning.

Institutional use of the survey data (as evident in a secondary survey)

But is it, really? Is it, in fact, useful to know answers to the three questions considered in this essay—What learning behaviors do students and faculty members value? Do campus spaces foster those behaviors? And where are the supportive spaces? To determine whether the learning behaviors and learning spaces questionnaires were actually useful to the six institutions, those who had instigated the surveys were asked—in a secondary survey, available at the author’s website—how the resulting data had been used and about its value.

Five institutions were asked these questions; administrative change at the sixth institution limited attention to the report there. I invited multiple respondents from each institution where such responses would better represent the range of interest in the questionnaires. Five institutions provided seven responses—three responses from University E and one response each from Colleges A and B and Universities C and D. Two respondents were senior academic officers; three were senior library officers; and the remaining two were library or administrative staff members.

These seven respondents were uniformly positive in saying the reports prepared for their institutions had been personally useful to them in thinking about learning behaviors on their campuses ($n=7$); in thinking about campus spaces for learning ($n=6$); and in thinking about future investments in campus space ($n=6$).²⁶ They valued having measures about how supportive of learning behaviors individual campus spaces are ($n=6$). In explaining this, one respondent observed that the report helped to “broaden the discussion on learning behaviors,” while another reported that “our most recent planning on both library and student commons space has become much more ‘actual student usage’ oriented.” Yet another observed that the report brought “into question the extent of the need to modify the library as a place for student learning. It seems our resources might better be applied to fostering an appreciation for students in multiple modes of learning behaviors.”

Respondents seemed particularly to value having information about how students and faculty members differ in their judgments about important learning behaviors ($n=7$). Their comments on this matter suggest how the survey results might help foster change. With regard to collaborative learning, for instance, one respondent observed that “I HOPE when we share the information more widely with faculty, they will partner with us to help students value collaborative learning as much as faculty (and librarians)



do.” Another noted that “the varied role of group interaction for students was not really noted by faculty, and has proven to be a critical aspect of our work toward increased use of the library as learning space.” More broadly, two respondents commented on the need to confer with both students and faculty when planning learning spaces. Another saw discrepancies between student and faculty judgments “as a means of assessing the effectiveness of our pedagogy” in the effort “to teach students a broader diversity of learning skills.” One senior administrative officer reported that “a surprise [result of the surveys] was the lack of commonality between students and faculty regarding the perception of an academic community This has challenged some dearly held (mis) perceptions and has initiated a vigorous dialogue about how a real sense of academic community can be achieved. This has been perhaps the most useful, and unexpected, outcome of the survey.”

Asked how they had used the report on learning behaviors and learning spaces, respondents reported:

- discussing it with classroom faculty, e.g., members of faculty committees (n=6)
- discussing it with students (n=3)
- using it as an element in planning academic programs aside from space (n=1)
- using it as an element in planning campus spaces (n=3)
- filing it (n=6)

The reports on the learning behaviors and learning spaces questionnaires submitted to each institution appear to have contributed somewhat usefully to bringing space planning into stronger alignment with the pedagogical values of faculty members and with the most effective learning behaviors of students. In this way, the reports have had some role in ensuring that investments in campus construction or renovation advance the basic educational mission of the institution.

Broader implications for space planning

One wants to say “exactly so!” to the argument, made by Carole Wedge and Thomas Kearns, that

at U.S. colleges and universities, the entire campus is a learning environment, often with the college town or urban neighborhood serving as an extension of that environment. But if one can learn anywhere, why is the magnitude of learning and academic accomplishment tangibly greater on the college or university campus? The simple answer is that the campus offers serendipitous interaction, convenient access to resources, and a broad range of environments in which to think deeply and explore possibilities, creating a wonderfully synergistic combination to advance and enhance learning, discovery, and creation of knowledge. Hence, the college campus as a successful learning community continues to attract students, faculty, and researchers pursuing the “life of the mind.”²⁷

The survey data reported in this essay suggests we should be cautious in adopting this attractive argument. Officers at University F might, for instance, ask about the success of a campus where outdoor spaces and the library are seen by student respondents as almost identically supportive of students discussing class material with other students (learning behavior #4, with z scores of 0.67 and 0.70 respectively). Or those concerned



with the provision of computer laboratories might consider that at the six institutions reported on here, studying alone was almost the *only* learning behavior student and faculty respondents identified as being distinctively supported by these labs. Faculty members, student services staff, and others wishing to enrich and strengthen the variety of learning behaviors students use might pause over the evidence that student and faculty respondents across all six institutions so rarely identified *any* campus space as distinctively supportive of *any* learning behaviors beyond collaborative learning and studying alone.

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While no claim can be made that these data are generally representative of colleges and universities,²⁸ the data certainly do challenge any unexamined belief about how broadly or how well non-classroom spaces support learning. It is important to re-visit beliefs about campus space as learning space and to ask more closely about how distinctively various campus spaces support learning behaviors that are important to students and to faculty members—not least because of the immense cost of non-classroom space, the intense competition among institutions centered on these spaces, and their potential for creating institutional identity and an identifiable academic culture.

What, for instance, might be involved in asking more closely about whether library space can support learning more broadly, strongly, and distinctively than it already does? We would have to begin with questions rarely asked or pursued with any rigor in library space planning. These are what Jeanne Narum calls “first questions”—questions about “the nature of the educational experience [that is desired for a given space. These are] ...questions that must be asked first and asked persistently throughout the [planning] process.”²⁹ They include:

Questions about educational experience and institutional mission

- What impact(s) does the library wish to have on student learning? What impact does it now have?
- To what percentage of the student body do our aspirations for educational impact pertain? With what percentage of the student body do we now realize our aspirations?
- In the endeavor to design libraries for learning, what does the word *learning* mean? What specific learning behaviors do we want library space to foster?
- For what reasons and how frequently do we want students to be in the library building? How do our aspirations for student use compare to their actual use of the library building?



- What relationship(s) between readers and librarians do we seek? Do the reference desk, other service points (including those in virtual space), and librarian offices effectively help to create this relationship?
- How much time do students now spend studying? How much time should they spend studying? How can space design help effect changes in students' level of effort or other study behavior that may be needed?

Questions about virtual and physical learning spaces

- What part of our desired impact on student learning is best realized in virtual space? What part can be realized only in physical space? What part of the latter has to be accomplished in the library building itself, and what part in other campus learning spaces?
- In what places do reference and instruction librarians work? For what percentage of a typical semester do they work there? Where *should* librarians work, and for what percentage of a typical semester should they work there?
- What is it about the learning that will happen in library space that compels a decision to build bricks-and-mortar learning space, rather than rely on virtual space?
- Beyond the classroom and the library, where are the most successful campus learning spaces? What makes them successful?
- What message, beyond that of welcome, should the library entrance declare? How might that declaration be made?

Asking these questions will lead planners in new directions. Answering them will require discovery processes that range far beyond the data about library operations that typically dominate library space planning. Bringing these questions and their answers to bear on space design will drive unconventional programming decisions among librarians and library architects.

How might such questions actually play out in space planning? To ask, for instance, about the library's impact on student learning is to ask first about institutional learning goals and to determine how various campus units—including the library—help advance those goals. This inquiry requires a set of assessment metrics far removed from the usual input/output statistics gathered by academic libraries.³⁰ It will prompt some possibly unsettling investigations, including one about the relationship between librarians and readers. If library staff create primarily a transactional and service-oriented relationship with readers, how powerful an impact on learning can they expect to have? Is a different relationship possible, where readers see library staff as true collaborators in learning? A decision to design for collaboration will likely yield radical changes in reference desks and other library spaces, changes that might advance an institution's mission much more powerfully than is possible with customary design practice.

As argued in this essay, designing library space for learning must start with a view of learning that embraces much more than individual and collaborative study, which today dominate library space planning. Consider the cyber café, for instance. Few libraries would now forgo this potent combination of food and technology. But its design should not be driven primarily by the requirements of food service and technology providers. The design should, rather, be molded by a wish to foster specific learning behaviors iden-



tified by the institution as critically important to achieving desired learning outcomes. These behaviors might include student-faculty interactions beyond the classroom, discussions among students of classroom material, diversity-prompted learning, etc. What is essential is making a powerful three-way connection in planning between institutional learning goals, observable learning behaviors, and space design.³¹

Designing library space for learning must start with a view of learning that embraces much more than individual and collaborative study.

Or consider the information or learning commons, now an all but mandatory feature of library space planning.³² Built around joint action by librarians and information technologists, and often including tutoring staff, these commons are regularly described as offering students the convenience of “one-stop shopping.” This emphasis on convenience leads to thinking of students more as consumers of services than as learners. Equally damaging, such a conception fails to motivate a deep collaboration as educators among librarians, technologists, tutors, classroom faculty, and students—the kind of collaboration that can make library commons spaces distinctive among all campus learning spaces and a powerful factor in students’ academic success.³³

Important as library space clearly is to students, it must be seen as but one element in the campus-wide provision of space, the fundamental purpose of which—as Wedge and Kearns rightly argue—is to bring students and faculty together for learning. The essential question before us is about the alignment between institutional mission and institutional resources. The principal findings of this essay suggest a significant misalignment.

Does such a misalignment matter? As the National Survey of Student Engagement observes, “what students put into their education determines what they get out of it.” This is especially true as regards the amount of time spent on learning tasks outside of the classroom. “Time devoted to preparing for class ... [is] positively related with other engagement items and self-reported educational and personal growth.” Nonetheless, “only about 11 percent of full-time students spend more than 25 hours a week preparing for class, the approximate number that faculty say is needed to do well in college. More than two-fifths (44 percent) spend 10 or less hours a week preparing for class.”³⁴ Time-on-task is a key issue for engaged, successful learning—for intentional learning. How self-consciously is campus space designed to encourage the investment of time such learning requires? And where else than on campus can students be expected—or indeed guided—to discover, develop, and exercise the skills of intentional learning?³⁵ Our answers to these questions will determine whether our massive investment in physical learning spaces performs well or ill—and whether the campus is a decisive asset or a decisive liability in the increasing competition between traditional and online modes of higher education.

If we wish the entire campus to function as learning space, we must listen to what students and faculty members say about learning and space. At the six institutions reported on here, both student and faculty respondents identified a set of learning behaviors important to them, with faculty respondents at most of the institutions espousing a wider variety of behaviors as important (CHARTS 1 and 2). Both student and faculty respondents at most of these institutions reported campus space as providing uneven or



plainly deficient support for these behaviors (CHARTS 2 and 3). When asked to identify specific spaces that are supportive of important learning behaviors, student and faculty respondents rarely identified any learning behaviors except collaborative learning and studying alone as being distinctively supported by any campus spaces other than libraries (CHARTS 5 and 6).

The challenge in investing in non-classroom space is to focus on the specific learning behaviors the institution wants to foster. This is rarely done. As observed at the outset of this essay, most often the design of such space is dominated by service provider concerns, as for instance the delivery of reader services in libraries, the provision of good

The challenge in investing in non-classroom space is to focus on the specific learning behaviors the institution wants to foster.

equipment in computer laboratories, and the delivery of food services in dining halls and other spaces. Most colleges and universities are not very intentional about the design of anything but classrooms, studios, and laboratories as learning spaces. We may say that most learning happens

outside of the classroom, but we rarely act on that belief by formulating a specific view of the intentional learning that is involved or by pursuing designs that actively foster such learning.

Surely we can—and must—do better than this. The choice before us is to continue our habits of inattention or deliberately and self-consciously to adopt a design practice rooted in institutional mission and the fostering of intentional learning.

Scott Bennett is Yale University Librarian Emeritus; refer to his website at www.libraryspaceplanning.com

ATTACHMENT 1: List of learning behaviors used in the questionnaires

Note: All but learning behaviors #2–3 are drawn from the National Survey of Student Engagement.

1. Students work with classmates outside of class to prepare class assignments [NSSE code: OCCGRP; FSSE code: FOCCGRP; typically abbreviated in this report as “Collaborative learning.”]
2. Students work alone, as individuals, to understand class material and to complete class assignments [NSSE and FSSE code: NA; typically abbreviated in this report as “Studying alone”]
3. Students, while working alone to understand class material and to complete class assignments, do this in proximity to other students working in the same way [NSSE and FSSE code: NA; typically abbreviated in this report as “Studying along”]
4. Students discuss ideas from readings or classes with others outside of class (students, family members, co-workers, etc.) [NSSE code: OOCIDEAS; FSSE code: FOOCIDEAS; typically abbreviated in this report as “Discussing material with other students.”]



5. Students discuss ideas from readings or classes with faculty members outside of class [NSSE code: FACIDEAS; FSSE code: FIDEAS; typically abbreviated in this report as "Discussing material with faculty members."]
6. Students work with faculty members on activities other than course work [NSSE code: FACOTHER; FSSE code: FFAOTHER; typically abbreviated in this report as "Working with faculty on non-course activities."]
7. Students work on a research project with a faculty mentor outside of course or program requirements [NSSE code: RESRCH04; FSSE code: FIMPRO5; typically abbreviated in this report as "Research outside of class with faculty mentor."]
8. Students have serious conversations with other students who are very different from themselves in terms of their religious beliefs, political opinions, or personal values [NSSE code: DIFFSTU2; FSSE code: FDIFFSTU; typically abbreviated in this report as "Discussions with others who differ in values."]
9. Students have serious conversations with other students who are very different from themselves in race or ethnicity [NSSE code: DIVRSTUD; FSSE code: FDIVRSTUD; typically abbreviated in this report as "Discussions with others who differ in ethnicity."]
10. Student pursue independent study or a self-designed major [NSSE code: INDSTD04; FSSE code: FINDST06; typically abbreviated in this report as "Independent study."]
11. Students have a senior culminating experience (comprehensive exam, capstone course, thesis project, etc. [NSSE code: SNRX04; FSSE code: FSENIOR; abbreviated in this report as "Culminating experience."]
12. Students participate in a learning community or some other formal program where groups of students take two or more classes together [NSSE code: LRNCOM04; FSSE code: FLRNCOM; typically abbreviated in this report as "Learning community."]

ATTACHMENT 2: List of learning spaces used in the questionnaires

- Residence halls
- Dining halls
- Student union
- Commons spaces in academic buildings
- Recreational and intramural sports facilities
- Outdoor spaces (e.g., arbors, gardens, benches, walkways, etc.)
- Libraries
- Computing laboratories
- Learning/Information commons
- Other (please specify)

This list consciously excludes classrooms, teaching studios, and laboratories; auditoriums; gallery and other display, rehearsal, and performance spaces; intercollegiate sports facilities; and administrative, student services, and health care buildings.



Notes

1. Scott Bennett, *Libraries Designed for Learning* (Washington, DC: Council on Library and Information Resources, 2004), 20–22, <http://www.clir.org/pubs/abstract/pub122abst.html> (accessed 3 February 2011).
2. I am much indebted to Danuta A. Nitecki, Dean of Libraries and Professor, College of Information Science & Technology at Drexel University, for her critical reading of an early draft of this essay, which is much improved because of her care. All remaining imperfections are my responsibility.
3. See the NSSE website, <http://nsse.iub.edu/index.cfm> (accessed 3 February 2011).
4. The remainder of this paragraph draws heavily upon the author's "Libraries and Learning: A History of Paradigm Change," *portal: Libraries and the Academy*, 9, 2 (April 2009): 181–197, for which the author owns the copyright; it is available under the Experience/Publication tab of the author's website, <http://www.libraryspaceplanning.com> (accessed 3 February 2010).
5. Phil Race, *Making Learning Happen: A Guide for Post-Compulsory Education* (London: Sage, 2005), 26–33.
6. John D. Bransford, Ann L. Brown, and Rodney R. Cocking, ed. *How People Learn: Brain, Mind, Experience, and School* (Washington, D.C.: National Academy Press, 1999), 97.
7. The term intentional learning is not, however, widely used beyond the scholarship of learning, and even there the concerns of classroom learning usually dominate. There is a substantial professional literature on intentional learning, including a major journal so titled.
8. Carl Bereiter and Marlene Scardamalia, "Intentional Learning as a Goal of Instruction," in *Knowing, Learning, and Instruction. Essays in Honor of Robert Glaser*, ed. L. B. Resnick (Hillsdale, NJ: Erlbaum, 1989), 363, 377–378.
9. For a useful review of the literature on the impact of metacognition or intentional learning in post-secondary education, see Melinda S. Burchard and Peter Swerdzewski, "Learning Effectiveness of a Strategic Learning Course," *Journal of College Reading and Learning*, 40,1 (Fall 2009):15–16.
10. These ten behaviors constitute all of the learning behaviors that figure in the NSSE survey that I identified as not primarily associated with classroom space. Their validity as elements in effective educational practice is well established. Two of the twelve learning behaviors do not figure in NSSE. (a) *Students work alone, as individuals, to understand class material and to complete class assignments* (#2 in the list of learning behaviors). Such "studying alone" is surely the most common of learning behaviors, strongly endorsed by a North American society that honors individualism and an academic culture that from grade school through graduate school prizes individual accomplishment. Studying alone is the default learning behavior of our academic culture. (b) *Students, while working alone to understand class material and to complete class assignments, do this in proximity to other students working in the same way* (#3). Such "studying along" is also widely practiced and fostered in such spaces as library reading rooms, but it is rarely named or identified as a specific learning behavior. Anthropologist Richard A. O'Connor describes this important learning behavior as follows: "Students readily distinguished between individual and group study, but their actual practices revealed a third type: studying along rather than alone or together. In effect, a student studies alongside others who are studying, sharing space but working separately rather than participating in a joint project. Checking with students as well as [faculty] colleagues brought quick recognition.... As our culture doesn't readily recognize such sentiments, it's worth quoting [two of] the students who tried to articulate this social experience.... 'It helps when someone else is around me studying because if they are working it helps me stay focused.' 'Seeing other people working provides encouragement.'" From O'Connor, "Seeing duPont [Library] within Sewanee and Student Life," a substantial appendix to the Task Force Final Report for the Jessie Ball duPont Library, 2005, at <http://library.sewanee.edu/libplan/plan1.html> (accessed 3 February 2010).



11. The landmark report *How People Learn* is silent on space design and exemplifies the neglect of the physical environment in understanding learning behaviors. Nancy Van Note Chism observes that very little has been written that applies learning theory to the design of learning spaces; see “A Tale of Two Classrooms” in *The Importance of Physical Space in Creating Supportive Learning Environments*, ed. Chism and Deborah J. Bickford, New Directions for Teaching and Learning. No. 92 (San Francisco, CA: Jossey-Bass, 2002), 8. Further illustrating this point is Betsy Barefoot, et al, *Achieving and Sustaining Institutional Excellence for the First Year of College* (San Francisco, CA: Jossey-Bass, 2005). This book presents case studies of colleges and universities with excellent first-year programs. The criteria for selecting the case study institutions included nothing about the spaces within which those programs are conducted. Some noteworthy exceptions to this inattention to learning space are the excellent collection of essays, Diana G. Oblinger, ed., *Learning Spaces* (Boulder, CO: EDUCAUSE, 2006), <http://www.educause.edu/LearningSpaces> (accessed 3 February 2011), and Jeanne Narum, “Transforming the Physical Environment for Learning,” *Change*, 36, 5 (October 2004): 62-66. See as well the EDUCAUSE Learning Initiative’s website on learning space design, <http://www.educause.edu/ELI/LearningPrinciplesandPractices/LearningSpaceDesign/5521> (accessed 3 February 2011); and Project Kaleidoscope’s Learning Spaces Collaboratory (<http://www.pkall.org/activities/PKALLearningSpacesCollaboratory.cfm>) (accessed 3 February 2010).
12. It should be noted that whereas NSSE typically asks about the *frequency* of these behaviors, the learning behaviors and learning spaces questionnaires ask about their *importance* to respondents. It is easy to imagine that a student might identify a given learning behavior as important but might, for a variety of reason, exercise that behavior only infrequently. One cannot assume a simple correspondence between NSSE results and the results of the learning behaviors and learning spaces questionnaires.
13. Access to the online surveys, to the instructions for institutions using the surveys, and to all of the survey data reported in this essay are available under the Learning Behaviors & Learning Spaces tab of the author’s website, www.libraryspaceplanning.com (accessed 3 February 2011).
14. None of the institutions sought to distinguish among respondents by academic discipline. One might reasonably expect students and faculty members in the sciences particularly to value commons spaces in their own academic buildings, while studio space is critical important to collaborative learning among those in the fine and performing arts. The surveys do not attempt to capture differences related to academic discipline, and in fact exclude studio and laboratory space from consideration just as they exclude classroom space. One might also reasonably expect views about learning spaces to differ among residential and non-residential students and to differ among campus-based students over time, as their residential arrangements and the demands of their academic programs change. The surveys gather information about the class standing and (for three institutions) the residential status of students, but low response rates make problematic any effort to track changes related to such data.
15. A follow up survey among those who instigated the surveys at each institution (see Section 8 below) indicated a quite reasonable uncertainty about how representative were the views expressed by respondents.
16. A final question invited student or faculty observations on any relevant topic. Questionnaire respondents typically used this unstructured option to comment either generally or quite specifically on campus space issues, to add nuance to responses made elsewhere in the questionnaire, or—most frequently—to reinforce points made in answering previous questions. These comments were regularly helpful in giving particular character and force to the reports of institution-specific data. Because the comments are germane only to a given institution, they do not figure in this report on all six institutions.
17. This list of learning spaces could be modified to reflect the circumstances of a given campus. So, for instance, because University F has no residence halls or information



- commons, those locations are not included in the report of Question 3 responses for that university (Data Sets 6a/b).
18. See, for instance, Data Set 6a at the author's website, which presents student responses to Question 3 at University F. At that institution, 170 student respondents gave a total of 608 affirmative responses regarding learning behavior #1, collaborative learning. This means that these students on average identified three or four spaces as being supportive of collaborative learning.
 19. One can expect a z score of 2.00 to occur once in every twenty observations because approximately 5 percent of the values in a normal distribution fall outside two standard deviations from the mean. One can expect a z score of 1.60 to occur about once in every 10 observations because approximately 10 percent of the values in a standard distribution fall outside 1.6 standard deviations from the mean. Findings with z scores between 1.60 and 1.99 may be considered as "approaching statistical significance." Obviously, the closer scores are to 2.00, the closer they are to actual statistical significance. Responses that approached statistical significance do not figure in this essay, although they received attention in the reports to individual institutions.
 20. See Data Sets 1a/b through 6a/b at the author's website.
 21. For instance, University F student responses to Question 3 approximate a normal distribution, except that most values cluster in a sharp peak between -1.0 and +1.0 with the remaining values are skewed to the right. The same is generally true of all other student and faculty responses to Question 3.
 22. There are many negative z scores in Data Sets 1a/b through 6a/b, indicating a somewhat negative view of spaces as learning space. This is expected in a normal distribution of scores, and none of these negative numbers is statistically significant.
 23. Two options for answering Question 3—recreational and intramural sports facilities and "other" facilities—are not represented in CHART 5 because there were no statistically significant responses regarding these spaces.
 24. Both student and faculty respondents often rated discussing class material with faculty members outside of class (learning behavior #5) as important or very important (see CHART 2). Except for faculty respondents at College A and student respondents at College B, neither group identified any space that distinctively fosters such discussion in statistically significant measure. However, many student and faculty respondents at all six institutions used the "other" option to name faculty offices and laboratories as fostering such discussions. It is reasonable to suppose that many more would have done the same if faculty offices had been available as an option. While recognizing this likelihood, it is important to ask whether faculty offices are customarily designed to foster intentional learning or are rather more often extensions of the classroom in affirming (through, say, the display of books) faculty authority over knowledge.
 25. For an example of a learning space purposefully associated with a residence hall, see William Dittoe, "Seriously Cool Places: The Future of Learning-Centered Built Environments," in *Learning Spaces*, 3.1–3.11.
 26. Questions about the value of comparing learning behaviors and learning spaces survey data with NSSE data from the institution itself and from its peers did not yield informative responses. One interlocutor commented that "as with other NSSE data, we are constantly trying to understand our local academic culture relative to others ...and ask why." Some commented on limited institutional access to NSSE data and uncertainty about how the institution uses that data.
 27. Carole C. Wedge and Thomas D. Kearns, "Creation of the Learning Space: Catalysts for Envisioning and Navigating the Design Process," *EDUCAUSE Review* 40,4 (2005): 32–38, <http://www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume40/CreationoftheLearningSpaceCata/157985> (accessed 3 February 2011).
 28. This methodological limitation is stated in Section 2 of this essay. Two other methodological issues should be mentioned. One is that the surveys were constructed to



produce only nominal or ordinal data, which limits possibilities for statistical analysis. More sophisticated statistical analysis might prove valuable in working with a larger, more representative number of respondents and with a much larger group of institutions than six. The other issue is that while the learning behaviors drawn from NSSE are well-validated elements of effective educational practice, the surveys in this study ask for respondents' self-reported perceptions relative to these behaviors, which of course may differ from matters of fact. For instance, differences in student and faculty respondent *perceptions* about how well campus spaces support a given learning behavior may suggest uncertainty about the actual *fact* of such support. Other modes of inquiry and observation might be used to address uncertainties arising from possible differences between perception and fact.

29. Jeanne Narum, "Building Communities: Asking the Right Questions," Project Kaleidoscope (N.D.), <http://www.pkal.org/documents/Building%20Communities%20-%20Asking%20the%20Right%20Questions.pdf> (accessed 3 February 2011). Narum was the long-time Director of Project Kaleidoscope and provides an excellent general review of sources on the design of learning spaces in "Transforming the Physical Environment for Learning," *Change*, 36, 5 (September/October 2004): 62–66. This issue of *Change* includes several articles discussing other aspects of current teaching and learning practices and their intersection with technology. See also Scott Bennett, "First Questions for Designing Higher Education Learning Spaces," *Journal of Academic Librarianship*, 33,1 (2007): 14–26, also available under the Experience/Publications tab of the author's website.
30. The fundamental issue is the value that academic libraries create for their institutions. On this matter, see the important literature survey by Megan Oakleaf, *The Value of Academic Libraries: A Comprehensive Research Review and Report* (Chicago: Association of College and Research Libraries, 2010), http://www.ala.org/ala/mgrps/divs/acrl/issues/value/val_report.pdf (accessed 3 February 2011).
31. For an excellent account of how to do this, see Chris Johnson and Cyprien Lomas, "Design of the Learning Space: Learning and Design Principles," *EDUCAUSE Review* 40, 4 (2005): 16–28, <http://www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume40/DesignoftheLearningSpaceLearni/157984> (accessed 3 February 2011).
32. There is a large professional literature on such commons. Excellent points of entry are Donald Robert Beagle, *The Information Commons Handbook* (New York: Neal-Schuman Publishers, 2006); Charles Forrest and Martin Halbert, eds., *A Field Guide to the Information Commons* (Lanham, MD: Scarecrow Press, 2009); and the website "Infocommons and Beyond" at <http://infocommonsandbeyond.blogspot.com/> (accessed 3 February 2011).
33. For evidence of limited collaboration in library commons, see Scott Bennett, "Designing for Uncertainty: Three Approaches," *Journal of Academic Librarianship* 33, 2 (2007): 168; also available under the Experience/Publications tab of the author's website.
34. *Student Engagement: Pathways to Collegiate Success*. NSSE [National Survey of Student Engagement] 2004 Annual Report of Survey Results (Bloomington, IN: Indiana University Center for Postsecondary Research), 13, <http://nsse.iub.edu/html/report-2004.cfm> (accessed 3 February 2010).
35. See Henry D. Delcore, James Mullooly, and Michael Scroggins, *The Library Study at Fresno State* (Fresno: Institute of Public Anthropology, California State University, Fresno, 2009), <http://www.csufresno.edu/anthropology/ipa/> (accessed 3 February 2010), for accounts of "Spaces of Student Scholarship" (34–37) and of a student-led exercise to design a specific library space, Studio 2 (39–42).

Correction:

Johns Hopkins University Press was mistakenly named as the copyright holder. Scott Bennett is the copyright holder. The online version of this article has been updated.

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