Academic Challenge:
Its Meaning for College Students and Faculty

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Academic challenge is seldom clearly defined. The authors' center for teaching and learning collaborated with a faculty member to investigate the perceived meaning of academic challenge among faculty and student samples at a small liberal arts institution. Participants completed a questionnaire designed to reflect those perceived meanings. Qualitative and quantitative analyses revealed contextualized information and suggested that students' perceptions are structured differently from faculty members' perceptions. The amount of time spent on academics was more centrally positioned in the students' perceptions than in the faculty members'. Future research approaches and directions for centers for teaching and learning are suggested.

Higher education institutions often depict their curricula as being challenging, rigorous, or meeting high standards. Rarely, however, are those terms defined in ways that would enable measuring the level of academic challenge or making comparisons across institutions. Without a commonly understood definition of academic challenge, institutional research into its level within a specific context, let alone generally, is not possible. Operationally defining the concept of academic challenge would be the first step in addressing levels of challenge. An operational definition can facilitate measuring the level of academic challenge. Then, adjusting challenge levels could affect learning goals, pedagogy, grading, and learning assessments.

Questions were raised at our small liberal arts institution regarding the level of academic challenge posed to students. Some of the white papers and internal reports on the state of academics at the institution exalted

the level of academic challenge. Others noted an urgent need to raise the challenge level. Such questioning had been undertaken, however, without a commonly understood definition of the concept. As the director of the center for teaching and learning, first author Karen viewed the pronouncements on academic challenge and the lack of a definition as being related to the center's mission: to promote excellent teaching for enhanced student learning. A high level of academic challenge is something the institution would like to claim, faculty would be expected to set high academic challenge as a standard, and students would expect to encounter academic rigor. Each stakeholder's goal can be supported through the work of the center for teaching and learning.

The Professional and Organizational Network in Higher Education (2012), an organization that advocates for those engaged in supporting teaching and learning in higher education, defines three functions of centers for teaching and learning: (a) **faculty development**: assisting faculty with their roles and responsibilities as teacher, scholar, and person; (b) **instructional development**: providing support and assistance with teaching, student learning, curriculum, and course design; and (c) **organizational development**: supporting the institution as it engages in the work of promoting student learning and excellent teaching. The sole professional at the center for teaching and learning at our institution, Karen is involved with all three of these development functions. In addition, she supervises three units that support student learning (tutoring, disability services, service learning), and she coordinates the assessment of student learning for the institution. Despite the center's limitations in staff and budget, it chose to assist, in a modest way, the stakeholders in reaching their goals by addressing the definition of academic challenge.

To begin work on the academic challenge project, Karen researched definitions that are used in higher education and the empirical literature on the topic. Preferring data over anecdotes, and finding no common definition and only a few published studies of the concept, she designed a questionnaire to reveal common perceptions about the meaning of academic challenge and to determine differences in responses between students and faculty. She sought assistance from an adjunct faculty member (second author Paul), who has a background in conducting social science research. Paul expressed interest in the project and subsequently volunteered to assist with the investigation and with this article.

The literature revealed the contextualized nature of academic challenge definitions at other higher education institutions. Therefore, we made no predictions regarding what our questionnaire would reveal about the perceptions of academic challenge. We made no *a priori* statements

regarding specific differences in responses between students and faculty at our institution. Rather, the exploratory work focused on determining the existence of an operational definition and exploring future research options for developing ways to measure academic challenge. In addition, we believed our work would advance the mission of the center for teaching and learning such that the faculty, instructional, and organizational development functions would be served.

Academic Challenge in the Literature

The few published studies that have empirically investigated the concept of academic challenge, or rigor, have emphasized the concept's contextualized nature. Miller and Shih (1999) surveyed 262 faculty about their perceptions of the differences in the analogous concept of academic rigor levels between on-campus and off-campus courses. At their institution, off-campus courses are delivered electronically, or they are taught traditionally at a site off campus. Their survey characterized academic challenge in several ways: as demanding high achievement (Braxton, 1993), as challenging students to strive for excellence (Unks, 1979), and as engaging students in active learning. Miller and Shih's results indicated that the faculty perceived on-campus courses to be more rigorous than off-campus courses. The authors believed, however, that these perceptions alone were not strong enough evidence to suggest that the teaching for rigor was different between the two types of courses.

Graham and Essex (2001) interviewed eight faculty and graduate assistants about academic rigor and how it can be ensured in face-to-face and online courses. They asked interviewees for a personal definition of the concept, for comments about the importance of academic rigor, and for strategies to help ensure it. The commonalities they discovered among the personal definitions included the notions of requiring critical thinking and high standards. Two responses that the authors labeled as interesting, but uncommon, were the notions of content coverage and student involvement. The strategies that interviewees suggested for ensuring academic rigor included faculty articulating their expectations, selecting high-quality readings, requiring critical thinking, and modeling scholarship and rigorous thinking. Graham and Essex cautioned, however, that their findings were based on a very small sample from a single institution.

The National Survey of Student Engagement (2012), often referred to as the NSSE (pronounced *Nessie*), provides higher education institutions with students' reflections on their learning, including academic challenge, and on their participation in education-related programs and activities. The

NSSE's explicit aim is to provide information that may be used to improve undergraduate education. In 2000, the NSSE began administration nationwide. Since then, over 1450 institutions have administered the NSSE at least once. In the context of this article, it is important to note that the NSSE is a prominent survey in the United States that taps students' perceptions about academic challenge. This prominence has led to the NSSE being used in research on academic challenge. For example, to facilitate better assessment and improvement in academic challenge at their institution, Payne, Kleine, Purcell, and Carter (2005) intended to develop an internal assessment instrument to monitor academic challenge. They interviewed 29 faculty and more than 40 students about academic challenge and about the appropriateness of the NSSE items for measuring the concept. The authors found a disagreement between faculty members and students. Several faculty believed that critical thinking, reading, and writing are integral to academic challenge. They did not, however, believe the NSSE items adequately reflect those elements. The authors reported that "overall faculty responses were more negative than those of students concerning the appropriateness of certain academic challenge items" (p. 137).

Although the NSSE purports to measure students' perceptions of academic challenge level, it relies on its own characterization of academic challenge. That characterization has been challenged. Porter, Rumann, and Pontius (2009) reported that the NSSE has poor validity. They claimed that the instrument uses educational jargon that students do not necessarily understand. Thus, it is problematic to attempt to measure the level of academic challenge without a commonly accepted definition. Moreover, the investigations reviewed here support the notion that academic challenge definitions must be viewed as contextualized depictions.

The findings from our research on academic challenge also can be viewed as contextualized, but they may be useful as our institution conducts its self-study for accreditation and develops its multi-year strategic plan. Furthermore, our method and findings could be useful to other institutions as they engage in similar investigations related to their claims about academic challenge. Because the center for teaching and learning, with the assistance of a faculty member, conducted the research, the findings would be neutral in the sense that it is the center's role to support all stakeholders' interests in teaching and learning issues.

Method

Participants

During 2009 and 2010 faculty meetings and similar opportunities at

our institution were used to ask faculty to participate in the research and to request that they have their students participate. This resulted in a convenience sample of 138 students and 31 faculty. Besides identifying participants as student or faculty, no other identifying or demographic information was gathered or recorded. Our Institutional Review Board approved this research and did not require informed consent.

Questionnaire Design and Procedure

The initial stage of questionnaire development involved reviewing the literature about academic challenge and considering the contextualized measures and methods that had been used and reported in the literature. The questionnaire began with an open-ended item asking participants to define academic challenge in their own words. Because the NSSE had been administered at our institution, we selected and adjusted some items from the NSSE that are identified on that survey as related to academic challenge. Because the questionnaire was to be used in an applied educational setting, brevity was important. The questionnaire was kept to 10 scaled items. These scaled items were designed to prompt the participants to judge how likely it was that an element would be included in their definitions of academic challenge.

Participants accessed and completed the questionnaire via our institution's website. Once participants typed in their free response about their perceptions of the meaning of academic challenge, they proceeded to the scaled items and were not able to return to the open-ended item. After completion of the scaled items, participants submitted the questionnaire. Responses were sent to an electronic database where student and faculty responses were kept separate.

Results

Scaled Item Analysis

Cronbach's (1951) Alpha was used to assess internal consistency within the scaled questionnaire items. This statistic showed acceptable levels of consistency, suggesting that the questionnaire measured one concept. The results for faculty members' responses were, however, significantly more consistent than those for students, or for when faculty and student responses were combined. These results support the notion that academic challenge can be defined in a manner that is consistently understood by students and faculty even though the two groups may have significantly different perceptions regarding the concept's meaning. The results also

suggest that the students' responses were different enough from the faculty members' to warrant separate analyses.

10-Item Smallest Space Analysis

Having used Cronbach's Alpha to determine that the 10 scaled questionnaire items acceptably measured a single academic challenge concept, the variances between responses to individual scaled items were investigated by using Smallest Space Analysis (SSA) (Canter, 1985; Guttman, 1968). SSA is useful in determining conceptual differentiations; therefore, we used it to reveal similarities in responses to individual items. Because there was no pre-existing structure in the questionnaire design, and we had no expectations as to how items would be evaluated, SSA was used as an exploratory technique.

Student results. The coefficient of alienation is the amount of unexplained variance in a sample. A coefficient of alienation of .20 or below is desirable (Borg & Lingoes, 1987; Donald, 1995; Hackett, 1995). The student sample's coefficient of alienation was 0.09561. The SSA analysis of the student sample (*n* = 138) revealed two facets. This two-facet solution (see Figure 1) embodied a *process* facet and a *focus* facet. The *process* facet differentiated items in terms of the stage in the process of academic challenge work that was present. We differentiated items into the three facet elements of input, output, and process. *Input* elements referred to these questionnaire items that describe academic challenge: number of assigned course readings, total pages written per course, average pages written per assignment, time spent studying or preparing for class, and time spent memorizing course material. *Output* elements referred to two items that describe academic challenge: taking examinations and the amount of effort required, and the frequency with which students exceed their perceived ability. *Process* elements included analyzing material content and judging material content. As can be seen from what made up each facet element, the input element contained items that made reference to the amount of effort and time associated with preparing or inputting course content. The output element contained items that were related to the end point of a course, including its assessment and faculty evaluations. The process element constituted questions that focused upon the need for students to analyze and judge the content of course materials. The arrangement of facet elements was circular, which suggests that differences between items and elements were qualitative in nature.

The *focus* facet differentiated questionnaire items in terms of their centrality to participants' perceptions of the academic challenge concept and, thus, had both *central* and *peripheral* elements. The *central* element com-

Figure 1
Student SSA 2 Dimensions, Coefficient of Alienation = 0.09561
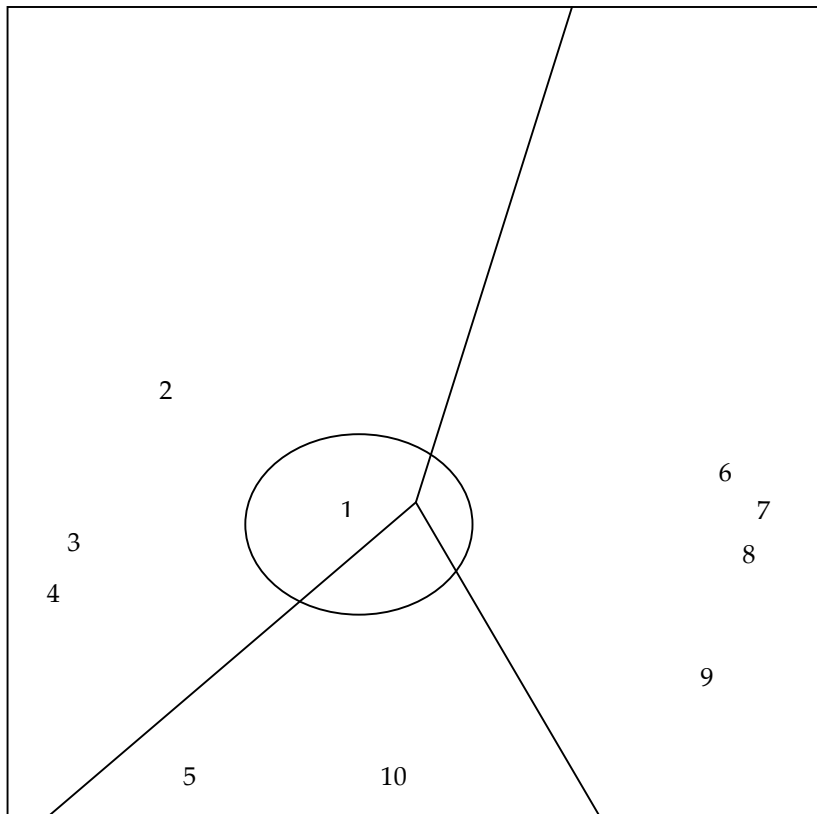
prised a single item. It asked respondents to rate how likely the amount of time spent on academic activities would be included in their definition of academic challenge. For students, the displacement of this item from the circular arrangement (qualitative) to a more central position suggested that this item, the time spent on academic work, was more related to all other items than to any other single item. Thus, for the student sample, the *focus* second facet suggested that the amount of time spent studying, reading, writing, and rehearsing for class was central to students' definitions of academic challenge (see Table 1 for details of facet structure).

Faculty member results. The faculty members ($n = 31$) SSA (coefficient of alienation of 0.13841) revealed a facet structure that was both similar

Table 1
Student Responses: Item Facet Element Composition

Referent Facet

Element	Questions	Element Components
Input (reading/writing)	2. Number of assigned course readings. 3. Number of total pages written for a course. 4. Average number of pages per writing assignment.	reading, writing, quantity
	1. Amount of time studying, reading, writing, or rehearsing for class. 5. Memorizing facts, ideas, experiences, or methods.	studying, rehearsing
Output	10. Examinations that require students to do their best work. 9. Frequency with which students exceed their perceived ability to achieve.	output, achievement
Processes	6. Analyzing the basic elements of an idea, experience, or theory. 7. Making judgments about the value of information, arguments, and methods. 8. Applying theories or concepts to problems or situations.	analysis, judgments, application, ideas, theories, methods, arguments, information, problems, situations

Table 1 (*continued*)
Student Responses: Item Facet Element Composition

Centrality Facet

Element	**Questions**	**Element components**
Central	1. Amount of time studying, reading, writing, or rehearsing for class.	studying, rehearsing
Peripheral	2. Number of assigned course readings. 3. Number of total pages written for a course. 4. Average number of pages per writing assignment. 5. Memorizing facts, ideas, experiences, or methods. 10. Examinations that require students to do their best work. 9. Frequency with which students exceed their perceived ability to achieve. 6. Analyzing the basic elements of an idea, experience, or theory. 7. Making judgments about the value of information, arguments, and methods. 8. Applying theories or concepts to problems or situations	output, achievement, analysis, judgments, application, ideas, theories, methods, arguments, information, problems, situations

and different to the student data analysis. In the *process* facet revealed in the faculty data analysis, the element structure was similar to the student analysis, with a circular arrangement of input, output, and process elements (see Figure 2). However, no items were displaced from this circular arrangement. That is, a centrality of focus did not occur in the faculty data. This suggested that all aspects of academic challenge were qualitatively differentiated features of the concept, with none of these being more central to faculty members' perceptions of the meaning of academic challenge. The faculty member process elements are detailed in Table 2.

Open-Ended Item Analysis

Students' and faculty members' responses to the open-ended item were analyzed both together and separately. Inspection of all student responses demonstrated that several students defined academic challenge as "something that challenges my mind" or "how challenging a difficult a course is." These responses were labeled as *challenge*. Other definitions reflected and were labeled *cognitive* ("learning new material" or "critical thinking"), *physical* ("stretch my capacity to understand" or "pushing students past their limits"), or *educational* ("amount of work required" or "how hard a class is"). All responses were categorized according to their correspondence to one of the four prevalent ways of defining the concept. In the student data set, 14.6% of the responses fit into the *challenge* category, 42% met the *cognitive* category, 15.4% met the *physical* category, and 27.7% met the *educational* category. In the faculty data set, 1% of the responses fit into the *challenge* category, 56% met the *cognitive* category, 16.6% met the *physical* category, and 25.7% met the *educational* category.

Discussion

Analysis of the data accomplished two things. First, a structural understanding of the academic challenge perceptions among the students and faculty was developed. This structure emerged from an analysis of responses and was not imposed *a priori*. Second, the separate analysis of students' and faculty members' responses identified a similarity and differentiation between the two groups. Analysis of students' and faculty's responses to the scaled items revealed a common structure within their perceptions of the processes involved in learning academically challenging material. This common structure involved both participant groups subclassifying the different processes in learning academically challenging material into input, output, and process activities. Furthermore, it did

Figure 2
Faculty SSA 2 Dimensions, Coefficient of Alienation = 0.13841
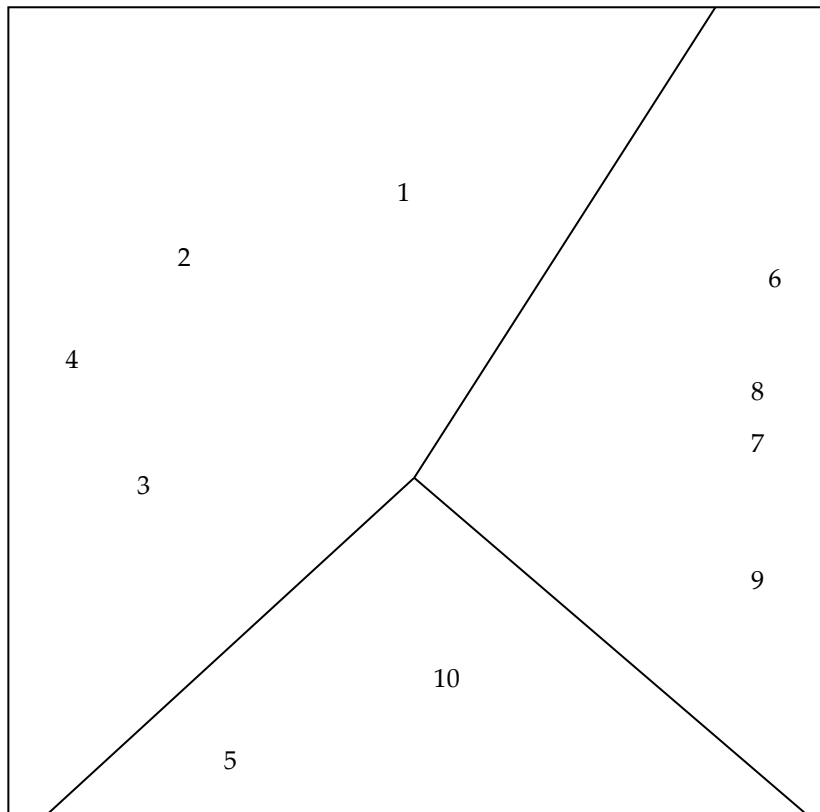
not appear that faculty and students perceived any of these processes as being more important than any other. Students also, however, simultaneously differentiated between different academically challenging activities in terms of the varied time implications associated with these activities. The implications of this are that faculty and students have a similar perception of the different forms of learning that are present in academically challenging material. For students, however, how long each form of learning will take is important, while faculty members do not tend to differentiate activities on the basis of the time they will take.

The discovery of a one-facet structure for the faculty and the two-facet structure for the students prompted our further investigation into

Table 2
Faculty Responses: Item Facet Element Composition

Referent Facet

Element	Questions	Element Components
Input (reading/writing)	2. Number of assigned course readings. 3. Number of total pages written for a course. 4. Average number of pages per writing assignment.	reading, writing, quantity
	1. Amount of time studying, reading, writing, or rehearsing for class. 5. Memorizing facts, ideas, experiences, or methods.	studying, rehearsing
Output	10. Examinations that require students to do their best work. 9. Frequency with which students exceed their perceived ability to achieve.	output, achievement
Processes	6. Analyzing the basic elements of an idea, experience, or theory. 7. Making judgments about the value of information, arguments, and methods. 8. Applying theories or concepts to problems or situations.	analysis, judgments, application, ideas, theories, methods, arguments, information, problems, situations

time references in responses to the open-ended item. Only one faculty participant (3.2% of all faculty) mentioned time spent or required in the open-ended item. The faculty member's response was "[work involved] spending a significant amount of time on material." Twelve students (8.7% of all students) referred to time spent or required for coursework. These frequencies are in agreement with the SSA plots, suggesting that time was a more important, or central, aspect of academic challenge for students

than it was for faculty. Students' references to time spent or required included the following: "a time-consuming piece of work that pushes me to my mental limits, but is ultimately rewarding," "the difficulty of an assignment, class, school, etc., usually determined by amount of time dedicated," "how rigorous the course load is and how much time is spent on outside work," "something fairly time consuming," and "a course that demands a great amount of time and effort."

The students' responses reflected both negative and positive perceptions. Because the faculty members' response was singular and relatively neutral, little can be said about how time relates to the meaning of academic challenge for faculty. In addition, because the faculty sample size was smaller than the student sample, the time aspect requires further research. Nevertheless, the differences between faculty and student responses illustrated the need to approach conversations about academic challenge from both perspectives. It is possible that faculty could more effectively communicate their expectations for the work they are requiring by explicitly addressing how long such work is expected to take. How this message should be communicated and the educational consequences of it are, obviously, questions for further research.

Another caveat must be considered here. Among the 10 scaled items there was one item related to the amount of time spent on coursework. The time item was also the first question in the scale, which may have had an effect. However, only students differentiated the item. While this article was in preparation, further research was being undertaken with middle school students (P. M. W. Hackett & J. Gorcos, personal communication, November 19, 2010) in which other questions related to time were included.

Our qualitative analysis of the open-ended questionnaire items unexpectedly revealed another structure within the responses. Our imposed *cognitive* response category that emerged from the analysis relates to a well-known cognitive classification system. In 1956, Benjamin Bloom and colleagues published a classification system that distinguished among levels of cognitive educational goals. It is referred to as *Bloom's Taxonomy*. The taxonomy was revised by Bloom's colleagues (Anderson & Krathwohl, 2001). Currently, Bloom's cognitive educational goals, in ascending order of complexity, are remembering, understanding, applying, analyzing, evaluating, and creating. Creating reflects the highest form of cognitive learning goals in Bloom's Taxonomy. Each level of the taxonomy must be achieved before moving to the next. Thus, remembering and understanding must be accomplished before evaluating or creating.

Two studies we reviewed for this research referred to Bloom's Tax-

onomy. Miller and Shih (1999) and Payne et al. (2005) described academic challenge, or rigor, as having qualities that align with the higher levels of cognitive educational goals in Bloom's Taxonomy. In addition, Clifton, Etcheverry, Hasinoff, and Roberts (1996), and Cohen, Clifton, and Roberts (2001) investigated the structure of Bloom's Taxonomy using factor analysis and the type of analyses used in our research, respectively. They found broad support for Bloom's components but did not concentrate on academic challenge.

The findings from our analysis of the open-ended responses also aligned with Bloom's Taxonomy in that the responses categorized as cognitive included terms similar to Bloom's cognitive educational goals. The following examples illustrate the similarity to Bloom's Taxonomy: "understanding in an academic discipline" (understand), "gathering data as part of analysis" (analyze), and "critically analyzing material" (evaluate). Because the participants began the questionnaire by responding to the open-ended item and could not go back and change their response after they completed the scaled items that approximate many of Bloom's terms, their responses were not prompted by their exposure to the scaled items. Therefore, the findings lend support to the appropriateness of using Bloom's Taxonomy as a basis for operationally defining academic challenge. Our future research plans include investigating the relevance of using Bloom's Taxonomy in this way. Discussions have been undertaken through concurrent and poster sessions about this research at a regional faculty development conference (St.Clair & Hackett, 2010), and through a poster session and proceedings for a conference focusing on research using the statistics employed in our research (Hackett, St.Clair, Gorcos, & McCarthy, 2011).

Besides the contributions of the data analyses as they relate to the academic challenge concept, this research addressed how centers for teaching and learning can contribute to the ongoing dialogue about issues that students, faculty, and administrators encounter. Not only can centers be viewed as liaisons between faculty and administrators, but also between faculty and students when it comes to teaching and learning issues. This research showed that the academic challenge concept is complex, and definitions can differ between students and faculty. Thus, by providing information, grounded in research, about the perceptions of academic challenge on a campus, the center can assume an impartial, yet helpful, role. The information is useful in terms of describing academic rigor, but the center does not evaluate how rigorous a faculty member's courses are. That typically would be taken up between administrators and faculty. By offering the information about the difference in expecta-

tions about challenge, administrators and faculty could narrow any gap in expectations about rigor.

Discussions about the meaning of academic challenge could facilitate an alignment between faculty and students as well. Through campus sessions that bring faculty and students together, commonalities about academic challenge can be built upon. On our campus, a student panel on the degree of academic challenge brought faculty and administrators into that conversation and we presented what were, at that time, our preliminary findings. Although no action was immediately forthcoming, it was a first step in generating awareness and encouraging conversation.

Regarding the organizational development function that centers for teaching and learning undertake, our confirmation of the contextualized nature of academic challenge underscores the need for institutions to operationally define academic challenge when promoting the value of their existence. When higher education institutions depict themselves as academically challenging, what does that mean? An institution cannot determine the level of challenge without having a way to define it. The center for teaching and learning is positioned to answer the question without passing judgment on the institution's choices to depict itself one way or another. The teaching and learning center's placement among the constituents who have interests in academic challenge—administrators, students, and faculty—and its role in enhancing teaching and learning make it the place to undertake research on academic challenge. Our research can be viewed as a step toward concerted efforts to depict academic challenge accurately.

Finally, although the center for teaching and learning at our institution does not require or expect the director to engage in the scholarship of teaching and learning, Karen has collaborated with faculty at our institution and at neighboring institutions on other research projects involving reflective practice and teamwork. Our research on academic challenge was a modest attempt to contribute to the literature and, potentially, to the practices about the concept in higher education. This and other projects not only reflect the level of commitment and professionalism of our center, but also provide a way for the faculty who collaborate with the center to boost their scholarship levels.

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