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Aligning Institutional Processes to Support Academic Rigor

Part three of a three-part series

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Institutional Processes

Academic rigor may be poorly conceptualized and not fully aligned with institutional processes because many assume it is an inherent quality of higher education without the need for examination (e.g., Labaree, 1997; Whitaker, 2016), or some may assume that it cannot be objectively assessed.

Such beliefs may be reflected by the teaching "philosophies" faculty members are expected to produce for job applications and for tenure and promotion portfolios instead of documents explaining the empirical research they use to inform their teaching practices. Though teachers had access to little well-designed empirical research a century ago, advances in research in areas such as education, educational psychology, cognitive psychology, and - more broadly - the scholarship of teaching and learning in multiple disciplines have provided a growing body of knowledge to enable instructors and faculty members to base their teaching practices on evidence to improve learning that goes beyond personal anecdotes, untested theories, and the norms and traditions associated with teaching in higher education. Thus, instead of narratives that describe a philosophy pertaining to one's unique personal beliefs about teaching and preferred teaching activities, scholarly narratives describing the application of research-based evidence on student learning to one's teaching would be more informative of the ways in which academic rigor is fostered in the learning context. This utilization of empirical research on improving learning reflects the shift from teaching as a teacher-centered activity to teaching as a student-centered activity whose purpose is to facilitate student learning.

Defining academic rigor as intentionally crafted and sequenced learning activities and interactions that are supported by research and provide students the opportunity to create and demonstrate their own understanding or interpretation of information and support it with evidence provides a framework for an objective examination of rigor and its alignment with institutional processes. Operationally defining academic rigor as specific observable elements of the learning context that are grounded in lessons gained from experience with—and research on—human learning enables those responsible for making claims regarding rigor to assess it and provide evidence to support the claims. This opportunity to make teaching visible provides the ability to critically examine the alignment of instances of rigor with institutional processes to facilitate and document it.

FACULTY - STUDENT INTERACTIONS AND STUDENTS' EVALUATION OF INSTRUCTION

To expand understanding and implementation of academic rigor, actions that faculty members can perform as they interact with students to facilitate their learning need further investigation. Many studies acknowledge that faculty-student interactions are important, but few provide evidence of specific behaviors that are associated with learning; whereas, others suggest that some faculty behaviors are unrelated, or even negatively related, to student learning. Specifying faculty members' behaviors that support learning is critical because many behaviors evaluated by students and administrators have not been demonstrated to facilitate learning.

The multidimensional model of academic rigor that includes active learning, meaningful content, higher-order thinking, and appropriate expectations proposed by Draeger, Hill, Hunter, and Mahler (2013) acknowledges that faculty members' expectations influence rigor as do the learning experiences faculty require of students, but specific faculty behaviors to foster rigor were not specified. Given its focus on active learning, it was noted that instructor presentation of content (e.g., lecture) was not consistent with active student engagement, so such behavior would not be considered rigorous (p. 274). In related research, Draeger Hill, and Mahler (2015) reported that some students described their interactions with teachers and classmates as related to rigor, but specific faculty behaviors that support rigor were not articulated.

The need to clarify faculty actions that support student learning is highlighted by previous research indicating students' ratings of faculty behaviors may be negatively related to key indicators of academic rigor (i.e., higher-order thinking skills and high academic expectations) and are unrelated to actual student learning. Specifically, Rugutt, Ellett, and Culross (1998) reported that students' perceptions of their relationships with teachers were negatively related to the extent they reported engaging in higher-order thinking skills and their ratings of academic self-efficacy. As such, students in their sample who rated the quality of teaching and learning in their courses more positively, rated interactions with their teachers less positively. These ratings appear to be compatible with the concerns surrounding expression of care noted by Schnee (2008). Though students appreciated the care they received in their program, the way the care was expressed (e.g., by lowering academic expectations) was in direct conflict with upholding academic rigor through high expectations for student work.

Though care was noted in the context of interpersonal interactions with teachers by Jaggars and Xu (2016), the meaning of care differed from that found in Schnee's (2008) results. These researchers examined online course organization and presentation, learning objectives and assessments, interpersonal interaction, and use of technology. Only the quality of interpersonal interactions predicted students' final grades in the course after controlling for student characteristics. Though the researchers called for a "more nuanced assessment of how the teacher communicates interpersonal presence and caring," caring in this study was rated based on meaningful interactions that predominantly focused on course content (i.e., "the types and nature of interactivity are determined by the desired learning goal, not by arbitrary criteria for collaboration or communication") (Jaggars & Xu, 2016, p. 282). This academic focus in which caring was expressed as actions to help students grasp the content in the course was positively associated with students' academic performance. However, expressions of care that lower academic expectations or are irrelevant to the academic content of the course may be harmful or, at best, unrelated to students' academic performance.

Other research utilizing direct assessments of student learning support this interpretation. For example, Pascarella, Terenzini, and Hibel (1978) had students rate their informal interactions with faculty members outside of the classroom and assessed the relationship between type of interaction and students' freshman year grade point average (GPA). After controlling for student characteristics, only the interactions in which students met with faculty to discuss "intellectual or course related matters" and "matters related to my future career" made unique contributions to predicting academic performance. Informal interactions with faculty members that were unrelated to the academic context did not contribute to the prediction (i.e., "to get basic information and advice about my academic program, to help resolve a disturbing personal problem, to discuss a campus issue or problem, and to socialize informally") (Pascarella et al., 1978, p. 457).

When learning gains over time were measured, Arum and Roksa (2011) found students' perceptions of how approachable faculty members were and whether students met with faculty outside of class did not predict student learning. Instead, they found that students who perceived that faculty held high expectations of them performed better on an assessment of learning after three semesters of college than those who perceived faculty held lower expectations. Also predictive of learning gains were indicators of a rigorous academic course design including number of lengthy reading and writing requirements students reported having in their course work (i.e., reading at least 40 pages a week and writing over 20 pages over the course of the semester). Overall, high faculty expectations and lengthy reading and writing assignments were the only significant predictors of academic growth across the first three semesters of college after adjusting for students' characteristics including academic preparation and the type of institution they attended (Arum & Roska, 2011, p. 95).

Micari and Pazos (2012) examined the association between students' self-reported relationship with their faculty instructor and their final course grades in a challenging organic chemistry course. The results indicated that the student-faculty relationship was positively related to students' confidence and course grades, but the relationship was small, which may have been affected by how the relationship was assessed. In addition to assessing qualities of the student-faculty relationship that were related to its academic nature (i.e., student was comfortable asking questions in class, student was comfortable going to the professor's office hours, and professor respects academic abilities of students in the class), the scale also included items that were not related to academic concerns (i.e., professor respects me as a person, and professor is a role model). Items more directly aligned with behaviors associated with student learning may produce a stronger relationship with academic performance.

When considering students' ratings of instructors on end-of-semester evaluations, a reexamination of previous research revealed that there was no relationship between students' ratings of teaching effectiveness and student learning. Uttl, White, and Gonzales (2017) noted that it was widely assumed that "students learn more from highly rated professors," and previous meta-analyses appeared to support this claim (p. 22). These meta-analyses were based on multi-section studies, in which multiple faculty members taught the same course, assessed students on the same exam, and were assessed by students on the same student evaluation of teaching instrument. In their research, Uttl et al. (2017) noted several methodological limitations of previous meta-analyses, including a failure to consider the size of the study sample used in each of the studies analyzed. After reanalyzing three previously published meta-analyses and performing a new one, the authors detected small study-size effects, in which studies with smaller sample sizes require larger correlation coefficients to reach statistical significance than studies with larger sample sizes. Because of a publication bias favoring statistically significant results over those that do not reach statistical significance, the large

correlation coefficients in the published literature did not reflect the actual size of the relationship between student ratings and learning. As such, the results of the previous meta-analyses, which were based on a majority of studies with small sample sizes, exaggerated the potential relationship between student ratings of teaching and learning. When the studies included in the meta-analysis were adjusted for small study-size effects, no relationship was found between students' evaluations of teaching (SET) and objectively assessed student learning. The authors concluded, "Universities and colleges focused on student learning may need to give minimal or no weight to SET ratings" (Uttl et al., 2017, p. 40).

Taken together, these results reveal the important role that faculty members' high academic expectations and actions to help students understand course content play in fostering student learning. Perhaps unsurprisingly in hindsight, the results reveal that faculty members' behaviors that directly support student learning (e.g., holding high academic expectations, interacting with students based on learning goals, discussing course-related content and students' career goals) are positively related to direct measures of student learning. More surprising are the findings that indicate that many faculty behaviors that are routinely rated by students and considered by administrators for personnel decisions (i.e., students' evaluations of teaching) are unrelated to student learning. In addition, lowering expectations as a way to show concern, socializing with students, being approachable, and providing advice unrelated to coursework were not related to student learning. If student learning is the goal, behaviors that faculty members display that are positively related to it should be assessed. To facilitate teachers' ability to uphold academic rigor by exhibiting behaviors that support student learning, institutional assessments including students' evaluations of teaching should be aligned to measure behaviors that are consistent with this goal.

Additional research is needed to further specify faculty behaviors that positively affect student learning. For example, Uttl et al. (2017) utilized an overall rating of the instructor or an average

of all behaviors evaluated on the SET in their analyses. It may be more informative to examine the association of specific faculty behaviors to direct measures of student learning. For example, more proximal faculty behaviors that directly support the academic content of the course may be found to be positively associated with student learning. More distal behaviors such as being warm, respectful, approachable, or available to students outside of class are polite social behaviors within relationships, but they do not imply that these behaviors are being deployed to facilitate student mastery of content, so they may be unrelated to student learning. Samudra, Min, Cortina and Miller (2016) took a step toward addressing these predictions by manipulating teachers' first impressions (i.e., good/confident/ enthusiastic vs. bad/monotonous/disinterested) and teaching quality (i.e., good/organized/complete vs. bad/disorganized/undetailed) via a recorded lecture to examine the impact on student learning. Student research participants watched the lecture and rated the teacher's personality (e.g., competent, confident, warm) and instructional quality (e.g., excellent, clear, interesting). Student learning was measured on an end-of-lecture quiz related to the content of the recorded lecture. Student learning was higher in the good teaching quality condition than the bad quality condition, an effect that was replicated in a second study utilizing a different teacher and topic. Overall, the results revealed that good first impressions improved ratings of the teacher's personality after the single lesson, but good teaching quality had a stronger impact on teacher ratings and learning. Despite these differences, the researchers acknowledged that a strong method of quantifying good vs. bad teaching quality is lacking, and the generalization of these findings to actual, interactive teaching and learning contexts needs investigation. The proposed definition of academic rigor may prompt faculty members to specify and test behaviors that define "good" teaching in their disciplines so these behaviors can be aligned with students' evaluations of instruction.

FACULTY TEACHING OBSERVATIONS AND EVALUATION OF TEACHING

Administrative evaluation of faculty provides opportunities for faculty members to demonstrate the variety of ways they promote academic rigor in their learning contexts; however, these processes may need revision to accommodate the multitude of ways rigor can be supported and the implications of upholding it.

Faculty behaviors are formally observed during teaching observations and annual faculty evaluations. These routine institutional processes can serve as opportunities for faculty members to demonstrate the variety of techniques they utilize in their learning contexts to facilitate student learning and provide support for their practices from the research literature and student learning artifacts. Hutchings, Huber, and Ciccone (2011) described calls for "richer representations" of teaching in which multiple lines of evidence are needed to make teaching visible to others, including student learning artifacts (p. 100). Faculty observation and evaluation contexts are an appropriate opportunity for these representations to occur, but existing processes may need revision to fully document the range of work in which faculty engage. Faculty members may be well served by reviewing their institutional procedures and corresponding documentation regarding teaching observation and annual evaluation of teaching to verify how well it accommodates the range of activities they can perform to promote academically rigorous experiences within and beyond the learning context (e.g., academic advising). This activity can stimulate discussions regarding the importance of academic rigor in the expectations of faculty and reveal shortcomings in making teaching visible that need to be addressed. Explicitly considering teaching practices that support academic rigor and facilitate student learning as a frame for revising teaching observation and evaluation processes may prompt better alignment of the goals these processes serve (e.g., retention, promotion, merit pay) with information that is related to student learning instead

of basing personnel decisions regarding teaching efficacy on information that is not related to student learning (e.g., student ratings of instruction as argued in Uttl et al., 2017).

Faculty can document the extent they foster academic rigor in their learning contexts by the inclusion of many types of data they use to inform their teaching. Fundamentally, faculty members can provide evidence that they are implementing the curriculum and expectations for student learning as stated at the program level (e.g., in master syllabi, grading rubrics, learning outcomes). Given concerns surrounding implementation fidelity, Mathers, Finney, and Hathcoat (2018) argued that "evaluating instruction is critical for higher education assessment reformation" (p. 1224). As such, the evaluation process should gauge whether the stated curriculum is explicitly addressed in the learning context, whether the assignments and assessments require the level of mental engagement stated in the learning outcomes, and whether the student artifacts are graded in a manner consistent with the level of cognitive engagement expected. Instead of merely observing what is occurring in the learning context, outcomes and expectations specified in the program context can be used to frame the observation and evaluation so that teaching can be assessed against these standards.

Beyond verifying compliance with program-level expectations, faculty members can document academic rigor in their learning contexts by including evidence that empirical research on student learning in the discipline informs course design and delivery. Instead of describing idiosyncratic beliefs about teaching and learning, faculty members can summarize and cite empirical research on improving student learning and provide course evidence that is a direct application of the research. Though this technique may not include a test of the educational practice in the faculty member's own learning contexts, it does provide evidence that one's teaching techniques are informed by data derived from objective research that extends beyond the faculty member's own anecdotal observations (i.e., it provides evidence of scholarly teaching).

Surpassing a scholarly approach to teaching, faculty members can actively contribute to the scholarship of teaching and learning by conducting research within their own learning contexts with the goal of improving student learning. This approach may involve crafting a teaching technique, receiving approval for the research proposal from the Institutional Review Board, implementing the technique, and using student learning artifacts as data to test the efficacy of the technique. When effective techniques are shared with the broader teaching community, such research not only serves the purpose of documenting academic rigor in one's own learning contexts, it also facilitates the inclusion of such techniques in others' learning contexts to further promote rigorous academic practices. This work may also benefit faculty members by supporting their obligations to conduct research, making it particularly fruitful.

When faculty members create research projects to test their own teaching techniques, they are systematically using student learning artifacts to create improvements to their teaching practices. But, even when faculty members are not engaged in formal research, they can still provide evidence that student learning data informs course revisions to document academic rigor in their learning contexts. Through course activities and assessments, faculty members routinely have access to a variety of data regarding students' learning such as performance on exams, writing assignments, demonstrations, and reflections. When faculty members examine these learning artifacts and identify needs to be addressed, they can make intentional course revisions to address these needs. After revisions are made, faculty members can compare subsequent student performance to student performance prior to the revision to gauge the efficacy of course revisions in addressing students' learning needs. Such course revisions that are clearly related to student learning needs and result in improvement of student learning provide evidence of academic rigor in the learning context. Arbitrary changes in the learning context (e.g., those not linked to student learning needs, those not linked to improving student learning) are not evidence of academically rigorous teaching practices.

To document academic rigor, faculty members can also provide evidence of engagement with students related to the academic content of the learning context (see Arum & Roksa, 2011; Jaggars & Xu, 2016; Micari & Pazos, 2012; Pascarella et al., 1978). Student-instructor interaction that is mutual and occurs in a variety of contexts such as formal discussions, informal question-and-answer sessions, and assignment feedback can support students' ability to learn when it is task focused (see Kluger & DeNisi, 1996). Such feedback also reflects the teacher's cognitive engagement in the learning activity. Though other types of student-faculty interactions may occur in the learning context, the empirical research to date does not indicate a positive relationship with student learning, so nonacademic types of interactions do not provide strong evidence of academically rigorous teaching practices.

Faculty members can also provide evidence of a sustained commitment to teaching and learning to document academic rigor in their learning contexts. For example, engagement in professional development activities related to teaching and learning that is linked to improvements in student learning is consistent with academic rigor. Likewise, incorporating institutional initiatives intended to enhance student learning into the learning context and assessing student artifacts for improvements in learning is consistent with academically rigorous teaching practices.

Obviously, these examples do not comprise an exhaustive list, but they do provide suggestions to support the multiple ways that faculty members can document claims of academic rigor in the learning context that can be evaluated in terms of their impact on student learning. Faculty members need flexible opportunities to explain and document with evidence their full array of techniques to support student learning as noted in the Statement on Teaching Evaluation, "The full dimensions of teaching should not be slighted in the desire to arrive at defensible data and systematic practices" (American Association of University Professors, 1975, p. 202). As such, faculty observations and annual evaluations provide platforms (with revisions as needed) to

showcase the extent of faculty members' work and provide opportunities for faculty to articulate the techniques they employ to support academic rigor. Further, not only can faculty practices be leveraged to document the academic rigor of their courses, unused or underutilized techniques that are consistent with academic rigor can be suggested for consideration to further expand faculty members' teaching repertoires.

To foster the inclusion of academically rigorous teaching practices in the learning context and subsequently support student learning, faculty observation and evaluation processes need to review and reward faculty members for using them. If faculty members are rewarded for indicators that may be antithetical to academic rigor (or threatened by them with loss of jobs or funding) such as retention and graduation rates, they may have little incentive to increase the academic rigor of their courses.

ASSESSMENT OF STUDENT LEARNING AND ENGAGEMENT

Though academic rigor is a quality of the learning context, it is of little value when removed from a consideration of what students know and can do as a result of participating in that learning context. However, existing assessments of student learning may fail to fully capture learning due to poor test construction or lack of relevance to real world applications of the information. Assessment of student learning may need revision to more closely reflect real world tasks and may need to be supplemented with opportunities for students to report behaviors related to engagement in the learning context.

Because the goal of academic rigor is to promote student learning, the assessment of student learning is a critical part of gathering evidence to support academically rigorous techniques. A learning context may contain an impressive array of research-based practices demonstrated to support student learning, but if the assessments of student learning are poorly designed, then there may be no evidence of learning despite the learning that is occurring. To provide

evidence of learning, sensitive measures of student learning that are relevant to students' future use of the information are needed.

Considering only the utility of assessment within the learning context is short sighted, as Figure 1 illustrates. Faculty members are well served by considering applications of the assessment measures they develop that extend beyond the learning context. Assessments have many applications within the institutional context to improve student learning in addition to providing a snapshot of one individual's learning on a specific assignment. To capitalize on the potential of assessment, faculty members can craft assessments with multiple contexts in mind. Though assessment of each student's learning in the immediate learning context may be the initial priority, the information gleaned from student artifacts can be used in aggregate to inform revisions to curriculum at the program level, revisions to teaching practices in the learning context, and support broader institutional assessment efforts. The use of student learning artifacts from course-level learning contexts to inform assessment needs within the institution is a current focus in higher education that is gaining traction (Kuh et al., 2015), and institutional processes can be benefitted by its expansion.

Considering the relevance of assessments of student learning to contexts external to the institution (i.e., the real world) may require a reconsideration of assessment scope and design. In designing assessments, the most useful may be those that allow students to practice transferring their knowledge and abilities to real world scenarios. Such assessments can reveal the depth of student learning and skills in need of remediation in the learning context, and they can facilitate students' ability to use information outside the learning context. In a meta-analysis of learning transfer in studies employing the testing effect, Pan and Rickard (2018) found that response congruency, elaborated retrieval practice, and high initial test performance were factors associated with the highest levels of transfer. Response congruency was defined as the extent to which the appropriate response in the new context was similar to the appropriate response in the initial testing context.

The more closely the initial testing responses were to responses required in the new context, the more likely transfer of learning was to occur. This effect implies that the more closely the learning context resembles the real world (or other contexts to which students are expected to apply what they have learned), the more likely students will be to use what they have learned in that context. Elaborated retrieval practice was defined as instructions to think about related information in addition to the information being tested and/or providing access to materials after the initial test that would help improve performance on a subsequent test. Results indicated that being prompted to consider all information studied in the learning context and/or having access to restudy materials after the initial testing increased the likelihood of transfer of the information to the new context. These results imply that students need practice in using information in context and discovering connections and distinctions among information instead of practicing it in discrete units, and students need an opportunity to restudy materials after testing (instead of merely being provided with a correct answer) to increase the likelihood of transfer of learning. This technique reflects the use of testing in the learning context as a formative assessment that not only evaluates knowledge of content but also serves as a learning opportunity prior to a summative assessment of the information. Finally, high initial test performance was associated with higher rates of transfer. This finding implies that students need adequate opportunities to practice their knowledge and skills before the initial testing experience. These practice opportunities can be provided in the learning context under the direction and guidance of the teacher to bolster mastery prior to testing. Overall, these results provide recommendations to assist teachers in creating learning contexts to facilitate learning and in designing assessments to both test and demonstrate it that have direct relevance to the real world in which students will be expected to transfer this learning, practices that support claims regarding the academic rigor of the learning context. These techniques also provide insights for increasing the relevance of students' coursework to their work and day-to-day lives, a critical predictor of students' perceptions of

the value and quality of their educational experiences (Strada Education Network and Gallup, 2018, May).

Viewing assessments of learning from a research-based perspective may also be useful in strengthening their design and expanding their use. From this frame, a measure is one of many operational definitions that is selected because it accurately reflects the broader construct. Applied to the learning context, a specific assessment of student learning is one of many options to demonstrate mastery of the content. This perspective enables an explicit consideration of the alignment of the assessment with the nature of content and the expectations for learning. The assessment can be revised or replaced if it fails to provide an appropriate operational definition of the content. This perspective also supports the need to objectively test that revisions to rigorous academic practices in the learning context lead to increased student learning. Considering assessment of student learning in a manner that can contribute to the scholarship of teaching and learning literature can provide valuable results beyond the single learning context.

Students' self-reports of their engagement in practices that support their academic success may also be useful to inform the quality of students' academic experiences. As Coates (2005) noted, "a measure which focuses on teaching alone would provide a significant, although insufficient, index of the quality of education" (p. 29). Though students' self-reports of their own learning are not valid substitutes for direct measures of learning, students may be relatively accurate at rating how frequently they engage in specific behaviors related to their education. Coates (2005) defined student engagement as "the extent to which students are engaging in a range of educational activities that research has shown as likely to lead to high quality learning" (p. 26). Such qualities are assessed by the National Survey of Student Engagement ("About NSSE," 2019) and include participation in educational activities, level of challenging coursework, perceptions of the campus environment, perceptions of educational and personal growth, and background information. In addition to these measures, educators may want

to request that students assess the frequency of specific faculty behaviors that foster academic rigor in the learning context. For example, students are first-hand observers of faculty behaviors such as whether the faculty member adhered to stated course requirements and expectations (i.e., converging evidence regarding implementation fidelity as noted in Mathers et al., 2018). These observations may include students' reports of faculty behaviors that support learning such as enforcing high expectations of student work, providing thorough responses to questions about academic content, and documenting the frequency the faculty member was absent from the learning context or ended class early. In addition, students can report the extent of their engagement with course materials such as the use of resources and the time spent with them, which can be tested as moderators in research studies of the relationship between academic rigor and student learning. In sum, these types of behaviors may be better evaluated by students than making estimates of their own learning and can be used as evidence of faculty and student behaviors in the learning context that support academic rigor. Taken together, these elements provide a more comprehensive examination of the extent of academic rigor in the learning context than may have been previously available.

SUPPORT FOR TEACHING

In their efforts to make teaching visible and document academic rigor in the learning context, faculty members may benefit from peer support for teaching. However, low participation rates in professional development opportunities and the stigma associated with seeking teaching support may inhibit meaningful collaborations among faculty, to the detriment of student learning.

As noted in Hutchings et al. (2011), teaching is not a siloed activity that occurs in isolation of colleagues; however, many make this choice. Arum and Roksa (2011) observed that in higher education "transformational change will remain elusive as long as the principle tenets of the academy remain in place" (p. 134). These tenets include the practices that teaching is a solitary activity, that faculty have little

incentive and time to reflect on and conduct research on teaching, and that the doctorate is a research degree instead of, in part, a teaching degree.

Such assumptions may be partly responsible for the low participation rates in professional development opportunities offered to faculty by their institutions. Sweet, Carpenter, and Blythe (2017) openly addressed this "undiscussed problem" in their description of initiatives intended to increase faculty participation in professional development events (p. 73). They described reviewing the literature on faculty development and finding that there were virtually no numerical reports of faculty participation rates at events sponsored by faculty centers for teaching and learning, except "a rare, out-of-date 1993 study," which stated that the number of faculty members participating in events rose from 10% to 70%, an initial estimate similar to the 15% participation rate they reported (p. 74). In a summary of international faculty development activities, Fink (2013) provided an estimate that 30-40% of 2-year and 4-year colleges in the U.S. have faculty development programs, and, in general, about 20-35% of faculty members participate each year at a level that could lead to changes in their teaching.

Though reasons provided for these low participation rates in institution-sponsored professional development activities may vary (e.g., scheduling conflicts, lack of time), poor participation rates signal faculty members' low prioritization of these activities. This lack of participation is strikingly similar to students' low participation rates in academic support services, which is consistent with their beliefs that they do not need them (Cheatle & Bullerjahn, 2015). It can be argued that if faculty members expect students to seek support for learning, then faculty members would seek support for teaching. But, this rationale (i.e., leading by example) is not likely to be sufficient in prompting faculty to change their behavior.

Additionally, the stigma associated with seeking teaching support needs to be replaced with a new frame that explicitly acknowledges the value of these opportunities. Hutchings et al. (2011, p. 13) noted that,

in the past, interventions for teaching were responses to crisis when faculty members did not have sufficient skills to manage their classrooms or were not up-to-date with new pedagogical approaches. However, more recently, professional development activities offered by institutions are couched (and perceived by some) as opportunities for growth instead of remediation. This growth perspective may foster faculty participation rates, which in the U.S. are predominantly voluntary (Fink, 2013). However, it may take a more aggressive approach to shift perceptions at the institutional level that includes efforts to reach all faculty such as implementing required trainings (e.g., Fink, 2013) or recruiting faculty members in each department to serve as facilitators for peers (e.g., Sweet et al., 2017).

Many benefits can be realized by faculty members who collaborate with colleagues to discuss effective teaching practices and ways to enhance student learning. Beyond more common faculty development topics such as writing measurable learning outcomes and providing helpful feedback on writing assignments, when implementing an evidence-based definition of academic rigor, faculty members may also benefit from exposure to empirical research on learning-related topics as it may be outside of their typical disciplinary focus. Such collaborations among faculty members in the same program, perhaps aided by support from the library or faculty centers for teaching and learning, can lead to an exchange of discipline-specific research on effective teaching practices that can be directly implemented into the learning context to support student learning. Similarly, collaborations among faculty members in different disciplines can provide opportunities to learn about research demonstrated to improve student learning beyond the scope of one's discipline and spark new ways to examine teaching and learning within the faculty member's own discipline. These discussions may also lead to interdisciplinary approaches to improve teaching and learning from faculty members who possess differing skill sets.

To perform their own research studies on learning, faculty members may need opportunities to learn about research designs and analysis techniques

that are relevant to their needs, or they may need opportunities to partner with offices of research or colleagues trained in these areas. Further, research indicates that faculty members may need support in understanding how to leverage the data they collect on student learning via the artifacts in their courses beyond recording it as a grade. In a survey of faculty members at U.S. institutions, Jaschik and Lederman (2016) found that only 27% of faculty agreed that assessment data has improved the quality of teaching and learning at their institution while 42% disagreed with this statement. From this survey, it is not clear what data faculty members were referencing, but direct assessment of student learning from faculty members' own learning contexts should be directly relevant to improving teaching and learning. If it is not, then the validity of the artifacts faculty members are using to assess student learning is in question, a significant issue that needs to be addressed. Perhaps instead, faculty members do not see the relevance of the artifacts documenting student learning from their courses as useful for assessment purposes. Data provided by Jaschik and Lederman (2016) reveal that this is likely as "nearly two-thirds of faculty members strongly agree or agree these assessment efforts are primarily aimed at satisfying outside groups, like politicians or accreditors" (p. 11). Only 19% of faculty members disagreed with this statement. Given these perceptions, faculty members may need assistance linking the data they already have on student learning to assessment processes to improve the curriculum, teaching and learning, and academic support services for students (see Figure 1) instead of assuming that a different type of data is needed that is unrelated to student learning (see Kuh et al., 2015). When support is provided in a nonthreatening context (i.e., in terms of continuous improvement not evaluation), faculty members will have a venue for sharing existing—and exploring new—teaching techniques to articulate and expand the academic rigor of their courses.

Adjunct faculty members need to be included in these discussions as well. Gaining their participation may be difficult if faculty members are remote and do not get compensated for their time, but web conferences and asynchronous opportunities to participate in discussions (e.g., forums hosted through the learning management system) may help to address some of these issues; however, other incentives may be needed to facilitate the participation of all faculty. In addition, academic student support services need to be included in discussion regarding student learning. Such collaborations between faculty members and student support service leaders can provide a context to more fully align these activities and the co-curriculum with the curriculum to enhance student learning. If institutional processes are aligned with a focus on documenting and enhancing academic rigor and making better use of students' assessment artifacts, faculty members may realize they cannot do this alone, which may also serve as an incentive to seek collaborations with others.

INSTITUTION AND PROGRAM MARKETING

Institutional communications to the public should reflect the value assigned and activities supported to foster academically rigorous experiences for the advancement of student learning. Institutions may need to reconsider marketing strategies to clarify the messages they are communicating to prospects, parents, students, and other stakeholders regarding the purpose of a higher education and their identity as an institution of higher education.

Though posting assessment data on institution websites has not been as useful as anticipated (Kuh et al., 2015), posting information about the academic experiences that students will have may be more helpful. Numerical data and explanations of prior revisions to the curriculum based on assessment activities and tests that are not personally relevant may not be easy to interpret because it may not be clear how this information affects the student. Instead, prospective students and parents may be more likely to understand and use information describing the learning experiences students will actually receive. As such, institutions may consider highlighting the techniques faculty members use to craft a quality educational experience for students. Such a description would not focus on the personal achievements of the faculty member; instead, it would focus on the types of evidence faculty use to craft meaningful experiences for students. This

type of message would convey the central focus and value of student learning. Pleitz, MacDougall, Terry, Buckley, and Campbell (2015) noted that discrepancies between initial expectations and actual experiences of 252 traditional college students were higher for academic experiences (e.g., level of rigor, studying, time pressures) than for expectations regarding social life (e.g., making friends, missing family, finding clubs) and fit with the institution (e.g., diversity of student body, living in dorms, sense of belonging). Marketing the institution's commitment to academic rigor and student learning may improve students' ability to formulate realistic expectations.

This focus on student learning via providing academically rigorous experiences is also a step toward addressing misperceptions regarding the college experience that have emerged in U.S. culture. For example, when institutions choose to focus on other aspects such as the monetary value of their endowments in their public communications, this focus increases the perception of prestige and resources at the institution, but the presence of these resources does not communicate any information about how the endowment will be utilized to facilitate learning opportunities for students. Misperceptions about the wealth of colleges (Jaschik & Lederman, 2018) can be perpetuated by this focus. To clarify some of this misperception, institutions can articulate the educational opportunities for students that are enabled by the endowment. For institutions that value student learning, increased learning opportunities for students can be marketed

as the source of pride, not the status associated with financial resources, which may not be explicitly linked to improving student learning. Though wealth will continue to be associated with status in the broader U.S. culture, institutions can leverage the resources they have in support of fair and equitable practices for students and make the public aware of it.

In addition, public perceptions of institutions as having misplaced priorities (Jaschik & Lederman, 2018) can be clarified when institutions of higher education focus on education in their communications instead of incentives to attract students that are unrelated to learning. In fact, it is not surprising that the public questions the value of a higher education when it is marketed in a way that does not appear to be about education. Institutions need to acknowledge the time and effort required for learning by highlighting the actions expected of both faculty members (i.e., the creation of academically rigorous learning experiences in addition to subject matter expertise in the discipline) and students (e.g., reading, performing research, writing over long periods of time) to achieve it. The purposes this learning serves in the broader community should also be communicated in addition to its applications to students' careers. This inclusion may assist institutions in expanding ways for students to practice their education in real world contexts to facilitate transfer of it when they enter the workplace, improving employers' perceptions of the value as well.

Implications of an Observable Definition of Academic Rigor

QUALITY EDUCATION FOR ALL LEARNERS

Definitions of academic rigor that are based on selecting the most qualified and well-prepared students do not provide access to a college education for many individuals. Creating processes that allow all learners, not only those who are already well prepared, access to a quality higher education and the resources they need to succeed are essential.

As Keller (2018) acknowledged,

> Reaching national educational attainment goals and meeting workforce needs are made even more difficult if institutional performance is judged solely by measures of "exclusivity" and "selectivity" that limit how student success outcomes are defined and do not recognize institutional efforts to address the underlying challenges faced by many students. (p. 91)

These challenges are reflected in the differential preparation students receive prior to enrolling in college and are deeply embedded in the culture. As Schnee (2008) noted, institutions are challenged to increase access to college for students with varying levels of academic preparation while maintaining academically rigorous standards for their learning. It will take realignment of multiple processes across the institution to support students in this endeavor; faculty members cannot do it alone. With the inclusion of more academically rigorous teaching practices and the corresponding expectations for them, institutions must provide academic support for students to help them meet these demands.

A definition of academic rigor that is based on evidential support of the instructional techniques in the learning context creates an opportunity for all learners to gain access to a high-quality education. Such an approach allows the instructional techniques to be observed, assessed, and improved with the goal of facilitating student learning, rendering them less

vulnerable to negotiation (e.g., lowering standards noted by Schnee, 2008; weak implementation fidelity noted by Mathers et al., 2018). This opportunity for observation is consistent with institutional requirements for teaching observation and evaluation (by administrators, peers, students, and external agencies) and goals for continuous improvement via assessment activities. This approach brings the scholarship underlying teaching and learning center stage to be leveraged in support of the goals of improving both teaching and learning. As Hutchings et al. (2011) observed,

> teaching has had pitifully few mechanisms to improve itself. What's needed is a set of practices that have traditionally been missing, and that the scholarship of teaching and learning is now bringing much more widely into play: habits of inquiry, analysis, exchange, and knowledge building that can be harnessed to campus agendas for improvement and woven into the institutional fabric in ways that make a difference for teachers and learning. (p. 41)

New developments in research can expand teaching repertoires that are aligned with this definition of academic rigor. This approach is not limited to specific disciplines or techniques, though the application of this definition of rigor will enable ineffective teaching practices to be replaced by techniques that promote learning, and it will provide evidential justification for doing so. This approach welcomes information regarding human learning and the scholarship of teaching and learning across all disciplines so that relevant techniques from any discipline can be leveraged to create a context to foster learning; territorial disputes and tending academic silos are poor uses of time when student learning is at stake. Though teaching and learning are situated in the context of specific disciplines, when research evidence can be meaningfully applied, it should be utilized, and a research-based conception of academic rigor fosters its use.

This definition of academic rigor also distinguishes decisions that reside in the learning context from decisions that reside at the program level regarding the curriculum. As Cain (2014) pointed out in the context of academic freedom, "in shared curricular decisions, the rights of the faculty as a group can in some circumstances take precedence over the rights of individual faculty" (p. 13). Distinguishing the program context in which curriculum decisions are made from the learning context in which teaching decisions are made clarifies faculty members' control of the teaching techniques and research evidence they leverage to support student learning. In sum, this approach to academic rigor supports students' access to college and outlines a pathway to quality learning that is paved with research evidence in support of the faculty member's approach to teaching and students' ability to learn. This definition can be applied to any learning context in higher education for any group of learners at any level of the curriculum.

STUDENTS VALUE RIGOR

Despite the challenges it adds, research indicates that students value academic rigor in their learning experiences. Students report being better prepared for the real world having been academically challenged, and their evaluations of their teachers are not compromised by rigorous learning experiences.

Based on students' memoirs, Schnee (2008) reported that some students are well aware of the challenges they will face in the real world and expect their educational experiences to prepare them for what is ahead. Supporting this claim, T. Tran (2018) summarized results from a recent Gallup-Purdue poll stating that students who strongly agreed that they were challenged academically were more likely to indicate that their alma mater prepared them well for life outside college (50% vs. 15%) and that their education was worth the cost (75% vs. 31%) compared to those who did not strongly agree that they were challenged. This author concluded, "Faced with the national trend of grade inflation, higher-education institutions should focus on challenging students academically rather than boosting their grades to improve short-term outcomes" (T. Tran, 2018).

Issues of grade inflation are compatible with concerns that academic rigor is a negotiable standard and reflect perceptions that reporting high grades for students will bolster their evaluations of faculty, which are considered in faculty retention and promotion decisions. However, research on students' evaluations of instructors indicated that rigorous grading standards are not associated with reductions in students' evaluations of the instructors as teachers (Schwartz, 2009). Capitalizing on a university-wide policy change that set targets for GPAs of undergraduate and graduate students in an attempt to curb grade inflation, Schwartz (2009) reviewed students' GPAs and their evaluations of instructors before and after implementation of the policy in several hundred courses in a school of business. The results revealed that while the policy was effective in reducing GPAs (i.e., an average decline of 12.6% for undergraduate students and 5.2% for graduate students), the reduction in GPA did not correspond to a reduction in students' evaluations of the instructor, which remained virtually unchanged from scores provided before the policy was implemented. These results revealed that even an intentional policy to lower grades did not correspond to a decline in students' ratings of their instructors as excellent teachers on indicators such as "gave clear examples, was receptive to questions, stimulated critical thinking, encouraged students to make independent judgements" (p. 165).

To examine the assumption "that lower student grades will result in lower course evaluations," Culver (2010, p. 331) examined the relationship between students' overall rating of the instructor, their level of engagement with the course materials, and their expected course grades using 320,557 evaluations of teaching from an undergraduate student sample. Quality of engagement was defined as low, medium, and high on items assessing the educational value of out-of-class assignments, time and effort required, and perceptions of gains in knowledge, critical thinking, and appreciation of the subject matter. The results revealed a significant main effect for both expected grades and quality of engagement on instructor evaluations, but these effects were qualified by a significant interaction. Those who

reported higher quality engagement with course materials provided high ratings of the instructor regardless of their expected grades; whereas, those who reported lower quality engagement with course materials rated the instructor higher when they anticipated higher grades. Given the finding that student engagement moderates ratings of course instructors, faculty members would be better served by creating materials that are engaging and effortful (i.e., academically rigorous) instead of assuming that higher grades alone improve ratings. Strikingly, students who expected to receive a D or F in a course in which they were highly engaged provided higher instructor ratings than students who expected to receive an A in a course in which they reported a low quality of engagement.

Taken together, these results reveal that students value academic rigor in their coursework when assignments challenge them to engage with the learning materials and content in meaningful ways. Such experiences do not appear to negatively affect their perceptions of the instructor, and these practices can bolster students' learning. When students realize that their learning experiences are applicable preparation for the real world, they view their effort as worth it.

PATHWAYS TO DEGREE COMPLETION

Defining academic rigor in assessable terms contributes to a shared understanding of factors that can promote student learning even beyond the higher education context. Adults today have access to a variety of opportunities for learning such as open access online courses, employee-sponsored training, job experiences, and collaborations with others on special interest projects. Because of the rapid increase of learning opportunities outside of the traditional higher education classroom and the increased mobility of adults into and out of higher education, a shared definition of academic rigor may facilitate students' ability to translate their prior learning experiences into college credit.

Prior learning assessment (PLA) is "the process by which many colleges evaluate for academic credit the college-level knowledge and skills an individual has gained outside of the classroom" (Klein-Collins, 2010, p. 6). In a large-scale examination of the outcomes of 62,475 students across 48 institutions, students who earned PLA credit had higher graduation rates (56%) than students who did not have any PLA credit (21%) over the seven years of data included in the study (Klein-Collins, 2010). Of the students who did not complete a degree in this time frame, students with PLA credit (56%) were more likely to complete 80% or more of the credits required for a degree than students with no PLA credit (22%). These results were similar to a subsequent study of the records of 26,122 students across six institutions in which students with PLA credit were more likely to graduate (42%) than students with no PLA credit (26%), though the retention rates for the last three semesters of the study (48%) did not differ between groups (Klein-Collins & Hudson, 2018). These results reveal that translating prior learning to college credit is associated with students' likelihood of completing academic degrees.

Klein-Collins and Hudson (2018) further examined the type of PLA experience students pursued to earn their PLA credits. Results indicated that those who demonstrated their prior learning by completing a portfolio assessment (66%) or passing a standardized exam (56%) or a combination of methods that included portfolio assessment (50%) had higher graduation rates than those who pursued methods for PLA credit that did not include these activities (46% for external-evaluated programs only and 22% for other methods such as credit for work-related licensure). Though the data included in the study could not reveal why this pattern emerged, the authors speculated that in addition to selection bias, in which the most motivated and higher-performing students opted for portfolio assessment or standardized testing, a cognitive factor could be at work. When students complete a portfolio assessment or take a standardized exam of their knowledge, they must review and "re-engage with what they have learned" (Klein-Collins & Hudson, p. 11). It may be that when PLA credit is awarded without having to demonstrate one's knowledge at the time of assessment, this method may be less helpful for

students' subsequent academic success than when students must demonstrate their knowledge at the time of PLA assessment. At this time, this prediction is purely speculative, and the authors "suggest exercising caution before concluding that some PLA methods might be better than others when it comes to student outcomes" (p. 11).

In light of the definition of academic rigor, practices that require students to re-engage with the academic content they have previously learned facilitate learning (e.g., testing effect, Roediger & Karpicke, 2006; spaced practice, Donovan & Radosevich, 1999). And, elaborative retrieval practice, in which students reactivate all knowledge learned instead of just item-specific information, facilitates students' ability to use information outside the learning context (i.e., transfer, Pan & Rickards, 2018). It may be that PLA methods that capitalize on the techniques known to enhance learning and transfer of learning may impact students' success beyond the immediate assessment context (i.e., the determination of credit). If so, earning PLA credits has benefits far beyond the obvious ones of saving students time and money, but research is needed in this area to test

the relationship between learning facilitated by PLA assessment and subsequent college performance.

A shared definition of academic rigor can also assist educational and training providers outside of higher education when crafting learning opportunities so that they facilitate learning and transfer of the content. As demonstrated by PLA practices, higher education organizations are not the only institutions who can provide quality, college-level learning experiences, and a shared definition of academic rigor can be utilized to support the design and delivery of these learning experiences. When institutions share an understanding of the conditions that facilitate learning and the assessment of it, more clear pathways to credit learning experiences can be created to strengthen the ability of higher education institutions and other agencies such as the American Council on Education and the Council for Adult & Experiential Learning to map prior learning experiences onto existing college coursework. Developing processes to better connect students' higher education with other learning experiences enables institutions to recognize the value of prior learning and credit students for it, facilitating their degree completion.

Conclusion

Aligning institutional processes with an observable definition of academic rigor – one that is based on research evidence and makes central the importance of student learning – requires a critical examination of existing procedures and documents to verify they acknowledge the multiple, evidence-based ways to demonstrate rigor and accommodate the implications of doing so. A more explicit and aligned approach to demonstrating rigor facilitates clear communication with stakeholders regarding the value of student learning to the institution.

A definition of academic rigor that encompasses support for teaching practices from the range of disciplines and research on human learning is not only measurable, it can be generalized across learning contexts, enabling institutions to communicate more

clearly with each other about students' learning experiences, creating pathways to facilitate students' entry into higher education. Most importantly, the definition of academic rigor proposed in this series places student learning as the goal of teaching and as the purpose of higher education.

No longer are good intentions and tradition sufficient frames for teaching-related decisions; today, empirical research on teaching practices is available and growing rapidly, so research-informed practices are possible. Faculty members today are in a position they have never been before to craft learning experiences for students based on evidence as we uphold our commitment to being "above all effective teachers and scholars" (American Association of University Professors, 2009).

References

About NSSE. (2019, March 15). Retrieved from http://nsse.indiana.edu/html/about.cfm

American Association of University Professors. (1975). Statement on teaching evaluation. *AAUP Bulletin, 61*(2), 200-202.

American Association of University Professors. (2009). *Statement on professional ethics.* Retrieved from the American Association of University Professors website: https://www.aaup.org/report/statement-professional-ethics

Arum, R., & Roksa, J. (2011). *Academically adrift: Limited learning on college campuses.* Chicago, IL: University of Chicago Press.

Cain, T. R. (2014, November). *Assessment and academic freedom: In concert, not conflict.* (Occasional Paper #22). Urbana, IL: University of Illinois and Indiana University, National Institute for Learning Outcomes Assessment. Retrieved from http://www.learningoutcomesassessment.org/documents/OP2211-17-14.pdf

Cheatle, J., & Bullerjahn, M. (2015). Undergraduate student perceptions and the writing center. *Writing Lab Newsletter, 40,* 19-26.

Coates, H. (2005). The value of student engagement for higher education quality assurance. *Quality in Higher Education, 11*(1), 25-36. doi: 10.1080/13538320500074915

Culver, S. (2010). Course grades, quality of student engagement, and students' evaluation of instructors. *International Journal of Teaching and Learning in Higher Education, 33*(3), 331-336.

Donovan, J. J., & Radosevich, D. J. (1999). A meta-analytic review of the distribution of practice effect: Now you see it, now you don't. *Journal of Applied Psychology, 84*(5), 795-805.

Draeger, J., del Prado Hill, P., Hunter, L. R., & Mahler, R. (2013). The anatomy of academic rigor: The story of one institutional journey. *Innovative Higher Education, 38,* 267-279.

Draeger, J., del Prado Hill, P., & Mahler, R. (2015). Developing a student conception of academic rigor. *Innovative Higher Education, 40*(3), 215-228. doi: 10.1007/s1075 5-014-9308-1

Fink, L. D. (2013). The current status of faculty development internationally. *International Journal for the Scholarship of Teaching and Learning, 7*(2), Article 4, 1-9.

Hutchings, P. Huber, M. T., & Ciccone, A. (2011). *The scholarship of teaching and learning reconsidered: Institutional integration and impact.* San Francisco, CA: Jossey-Bass.

Jaggars, S. S., & Xu, D. (2016). How do online course design features influence student performance? *Computers & Education, 95,* 270-284. doi: 10.1016/j.compedu.2016.01.014

Jaschik, S., & Lederman, D. (2016). The 2016 Inside Higher Ed survey of faculty attitudes on technology: A study by Gallup and Inside Higher Ed. Retrieved from https://www.insidehighered.com/booklet/2016-survey-faculty-attitudes-technology?utm_source=link_newsv9&utm_campaign=item_197870&utm_medium=copy

Jaschik, S., & Lederman, D. (2018). 2018 survey of college and university presidents: A study by Inside Higher Ed and Gallup. Retrieved from https://www.insidehighered.com/booklet/2018-survey-college-and-university-presidents

Keller, C. M. (2018). Reframing rigor: Implications for institutional practice and policy. *New Directions for Higher Education, 181,* 89-96. Retrieved from https://onlinelibrary.wiley.com/doi/full/10.1002/he.20273

Klein-Collins, R. (2010). *Fueling the race to postsecondary success: A 48-institution study of prior learning assessment and adult student outcomes.* Retrieved from https://www.cael.org/pla/publication/fueling-the-race-to-postsecondary-success

Klein-Collins, R., & Hudson, S. (2018). Do methods matter? PLA, portfolio assessment, and the road to completion and persistence. Retrieved from the Council for Adult & Experiential Learning website: https://www.cael.org/

Kluger, A. N., & DeNisi, A. (1996). The effects of feedback interventions on performance: A historical review, a meta-analysis, and a preliminary feedback intervention theory. *Psychological Bulletin, 119*(2), 254-284.

Kuh, G. D., Ikenberry, S. O., Jankowski, N. A., Cain, T. R., Ewell, P. T., Hutchings, P., & Kinzie, J. (2015). *Using evidence of student learning to improve higher education.* San Francisco, CA: Jossey-Bass.

Labaree, D. F. (1997). Public goods, private goods: The American struggle over educational goals. *American Educational Research Journal, 34*(1), 39-81.

Mathers, C. E., Finney, S. J., & Hathcoat, J. D. (2018). Student learning in higher education: A longitudinal analysis and faculty discussion. *Assessment & Evaluation in Higher Education, 43*(8), 1211-1227.

Micari, M., & Pazos, P. (2012). Connecting to the professor: Impact of the student-faculty relationship in a highly challenging course. *College Teaching, 60,* 41-47. doi: 10.1080/87567555.2011.627576

Pan, S. C., & Rickards, T. C. (2018). Transfer of test-enhanced learning: Meta-analytic review and synthesis. *Psychological Bulletin, 144*(7), 710-756. doi: 10.1037/bul0000151

Pascarella, E. T., Terenzini, P. T., & Hibel, J. (1978). Student-faculty interactional settings and their relationship to predicted academic performance. *Journal of Higher Education, 49*(5), 450-463.

Pleitz, J. D., MacDougall, A. E., Terry, R. A., Buckley, M. R., & Campbell, N. J. (2015). Great expectations: Examining the discrepancy between expectations and experiences on college student retention. *Journal of College Student Retention: Research, Theory & Practice, 17*(1), 88-104.

Roediger, H. L., & Karpicke, J. D. (2006). The power of testing memory: Basic research and implications for educational practice. *Perspectives on Psychological Science, 1,* 181-210. doi: 10.1111/j.1745-6916.2006.00012.x

Rugutt, J. K., Ellett, C. D., & Culross, R. R. (1998, January). *Discriminating student learning and efficacy levels in higher education: Contributions of classroom environment and teaching and learning effectiveness.* Paper presented at the Annual Meeting of the Southwest Educational Research Association, Houston, TX.

Samudra, P. G., Min, I., Cortina, K. S., & Miller, K. F. (2016). No second chance to make a first impression: The "thin-slice" effect on instructor ratings and learning outcomes in higher education. *Journal of Educational Measurement, 53*(3), 313-331.

Schnee, E. (2008). "In the real world no one drops their standards for you": Academic rigor in a college worker education program. *Equity & Excellence in Education, 41*(1), 62-80. doi: 10.1080/10665680701764502

Schwartz, D. A. (2009). The impact of more rigorous grading on instructor evaluations: A longitudinal study. *Journal of Research in Innovative Teaching, 2*(1), 162-172. Retrieved from https://www.nu.edu/wp-content/uploads/2018/11/7638_JournalofResearch09.pdf

Strada Education Network and Gallup (2018, May). From college to life: Relevance and the value of higher education. Retrieved from http://www.stradaeducation.org/consumer-insights/relevance-and-higher-education/

Sweet, C., Carpenter, R., & Blythe, H. (2017). Reaching those faculty not easily reached: How CTLs can improve participation in faculty development programming through faculty innovators and online instruction. *Journal on Centers for Teaching and Learning, 9,* 73-83.

T Tran. (2018, February 26). Academic rigor linked to alumni perceptions of college value [Web log post]. Retrieved from https://news.gallup.com/opinion/gallup/228263/academic-rigor-linked-alumni-perceptions-college-value.aspx?g_source=link_NEWSV9&g_medium=SIDEBOTTOM&g_campaign=item_226934&g_ent=Academic%2520Rigor%2520Linked%2520to%2520Alumni%2520Perceptions%2520of%2520College%2520Value

Uttl, B., White, C. A., & Gonzalez, D. W. (2017). Meta-analysis of faculty's teaching effectiveness: Student evaluation of teaching ratings and student learning are not related. *Studies in Educational Evaluation, 54,* 22-42. doi: 10.1016/j.stueduc.2016.08.007

Whitaker, M. (2016). (Re)defining academic rigor: From theory to praxis in college classrooms. *Currents in Teaching & Learning, 8*(1), 4-17.
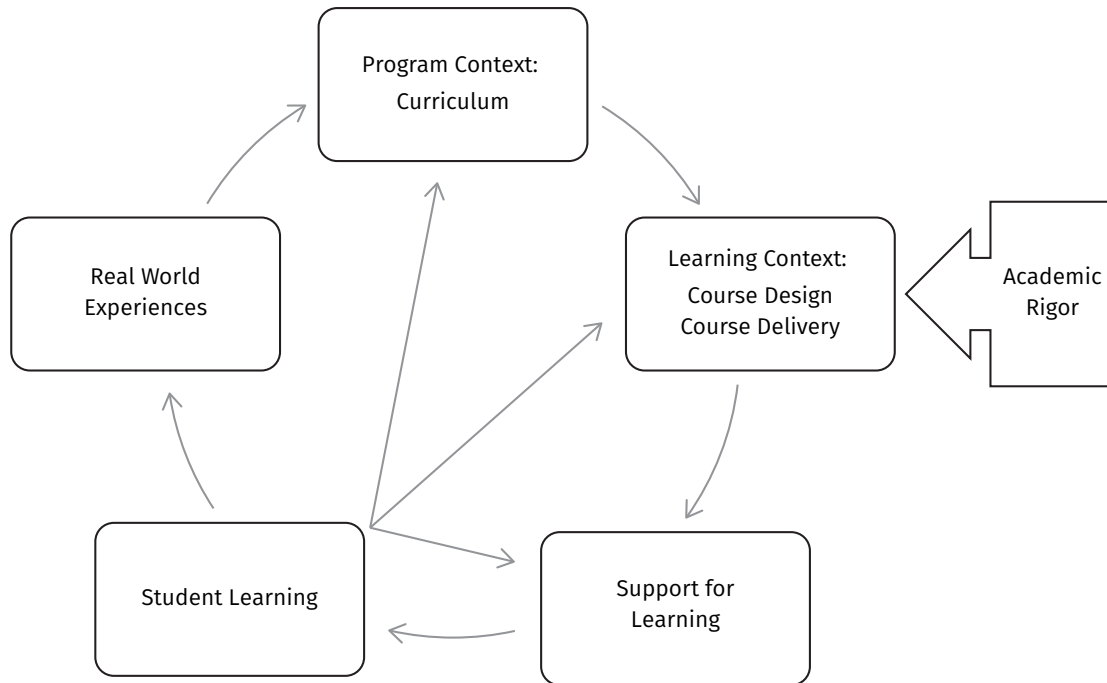
Figure 1. *Location of academic rigor in the context of students' personal and professional lives in the real world and within the institutional context of programs, learning context, student support for learning, and assessments of student learning. Student learning assessments can be used internally to the institution for revisions to the program curriculum, the learning context, and support services provided for learning.*