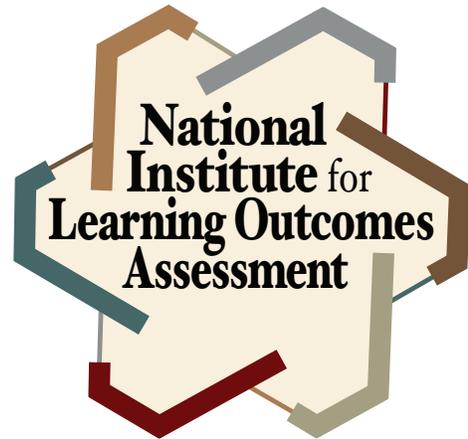


November 2020

Nº 47



Grand Challenges in Assessment: Collective Issues in Need of Solutions

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Contents

Abstract3

Grand Challenges in Assessment: Collective Issues in Need of Solutions4

Grand Challenges and Assessment. . . .4

The Ten Grand Challenge in Assessment5

- Drive Innovation. . . .5
- Inform Budget5
- Immediate Improvements. . . .6
- Increase Equity. . . .6
- Disaggregate Data. . . .7
- Change Over Time. . . .7
- Student Self-Evaluation. . . .8
- ePortfolios. . . .8
- Massive Data. . . .9
- Communicate. . . .9

Final Words. . . .10

References. . . .11

About the Authors. . . .16

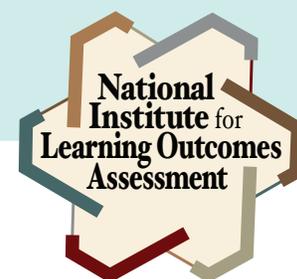
About NILOA. . . .17

Please Cite As:

Singer-Freeman, K., & Robinson, C. (2020, November). *Grand challenges in assessment: Collective issues in need of solutions* (Occasional Paper No. 47). Urbana, IL: University of Illinois and Indiana University, National Institute for Learning Outcomes Assessment.

NILOA Mission

The National Institute for Learning Outcomes Assessment (NILOA), established in 2008, is a research and resource-development organization dedicated to documenting, advocating, and facilitating the systematic use of learning outcomes assessment to improve student learning.



Abstract

A number of national and international organizations have compiled lists of grand challenges to unify the efforts of scholars and practitioners in a field. Unified efforts increase the possibility of creating meaningful and lasting progress. In this paper we share ten grand challenges that were identified through an examination of the assessment literature and a national survey. Each of the grand challenges are described. The four challenges which were identified as being of greatest concern to the assessment community are currently being addressed by the Grand Challenges in Assessment Project for possible collective solutions.

Grand Challenges in Assessment: Collective Issues in Need of Solutions

Karen Singer-Freeman & Christine Robinson

A grand challenge is defined as a problem requiring collective cooperation within a community of scholars to successfully resolve. Grand challenges were first identified via a publication of a list of mathematics problems by Hilbert (1902) in an attempt to advance creative solutions. Since that inception, grand challenges have been identified by national and international organizations who generate lists of challenges to unify and converge the efforts of scholars and practitioners within colleges and universities and affiliated organizations (Omenn, 2006). While grand challenges have been undertaken to address problems such as creating economical sources of solar energy (National Academy of Engineering, 2016), developing renewable fuel alternatives (National Research Council, 2005), and including active science inquiry in all introductory college science classes (Alberts, 2013), the field of assessment had not yet employed the concept of grand challenges to address some of the most enduring issues in need of solutions through collective research and action. This paper explores why grand challenges are a useful conceptual framework to advance assessment efforts and outlines the ten grand challenges identified in a review of the literature—arguing that it is indeed the case that the field of assessment in higher education has grand challenges in need of collective solution development.¹

Grand Challenges and Assessment

Perceptions about the value and worth of assessment in higher education at times are bleak. A survey of chief academic officers found that almost a third thought assessment was for appeasing politicians and accreditors as opposed to improving teaching and learning, while almost a fifth did not agree that systems of assessment have led to improvements in quality of teaching and learning (Jaschik & Lederman, 2020). This is not a new narrative to assessment professionals who are well aware of the negative perceptions bestowed upon assessment, and frequently struggle to assuage negative perceptions of assessment (Ariovich et al., 2019). However, as is often the case with wicked and complex issues, simply ignoring them will not make them go away.

To identify the grand challenges of assessment in higher education, we reviewed assessment websites, blogs, discussion boards and publications from 2015-2019. We chose to limit the review to this time period to maintain a future oriented perspective. The reviewed materials included 83 pieces of writing with 46 non-peer-reviewed sources, 34 peer-reviewed sources, and three blog or discussion board posts. This review resulted in the identification of ten potential challenges that were frequently mentioned and fulfilled the four defining characteristics of grand challenges:

1. Extremely hard to do, yet doable.
2. Produces positive outcomes potentially affecting large numbers of people.
3. Associated with clear metrics and goals so progress and completion can be identified.
4. Captures popular imagination, and thus garners political support (Gould, 2010; Stephan et al., 2015).

¹To learn about the full process of identifying and narrowing the grand challenges for assessment see Singer-Freeman and Robinson (2020).

Grand challenges address enduring issues in need of solution through collective research and action. This paper presents ten grand challenges in assessment.

These challenges were included in a national survey of higher education assessment professionals (Singer-Freeman & Robinson, 2020). The four challenges with broad support now serve as a starting point for strategic planning and collective problem solving, an effort currently underway, with endorsements from nine national organizations (American College Personnel Association, Indiana University-Purdue University Indianapolis Assessment Institute, Association for Institutional Research, Association for the Assessment of Learning in Higher Education, Association of American Colleges and Universities, Council for the Advancement of Standards in Higher Education, NASPA: Association of Student Personnel Administrators, National Institute for Learning Outcomes Assessment, and Student Affairs Assessment Leaders). In this paper we describe all ten challenges and invite assessment professionals to begin the important work of creating solutions.

The Ten Grand Challenges in Assessment

Drive Innovation. The process of assessment should produce visible and actionable assessment findings that drive innovation. Innovation requires future-oriented considerations of change that brings together assessment and planning activities (Jorgensen, 2018). The field of assessment has shifted from conducting assessment to demonstrate compliance towards producing actionable assessment findings to drive learning improvement and informed decision making (Baer, 2017; Blaich & Wise, 2018; Horst & Ames, 2018; Ikenberry & Kuh, 2015; Jankowski, 2018; Kuh et al., 2015; Pasquerella, 2018; Roscoe, 2017; Stanny, 2018a, 2018b; Suskie, 2019). Although there *has* been an increase in the use of data-driven decision making, there is not evidence that data-driven decisions have *improved* students' experiences or outcomes (Cox et al., 2017). This finding might be explained by a lingering challenge. To effectively drive innovation, it is essential to improve assessment methodology so that evidence gathered informs our understanding of the outcomes associated with innovative practices. In addition, we must identify the causes of gaps in student learning, identify evidence-based solutions from the research literature, determine whether selected interventions are implemented with high fidelity, and measure the extent to which the interventions drive learning improvements (Eubanks, 2017; Fulcher et al., 2017; Smith et al., 2017; Stitt-Bergh et al., 2018). Assessments that drive innovation also require authentic faculty involvement (Neuschel & Rego, 2018; Rickards & Stitt-Bergh, 2016; Roscoe, 2017; Stevenson et al., 2017; Suskie, 2015). As one of the four challenges with broad support, this challenge is currently being addressed by the Grand Challenges in Assessment Project (Singer-Freeman & Robinson, 2020).

Inform Budget. Assessment findings should be used to inform budgetary decisions. As the cost of higher education rises precipitously, there is increasing urgency in finding ways to reduce institutional costs and direct funds strategically for improvement (Kuh & Ikenberry, 2018; Suskie, 2016). Performance-based funding for state colleges and universities has been identified as a top issue facing higher education by the American Association of State Colleges and Universities and has been recommended as a best practice by both the Lumina and Gates Foundations (Baer, 2017). Return on investment tools estimate the extent to which instructional improvement efforts (Rossman et al., 2019) and student success initiatives (Desrochers & Staisloff, 2018) are likely to provide value beyond their predicted costs. Tools like these have the potential to integrate assessment findings with research findings. Nonetheless, inherent in performance-based funding is



the tendency for funds to flow towards current success which may conflict with long term strategic priorities. For example, performance-based funding might negatively impact equitable access to higher education if institutions only admit students who are most likely to graduate based on previous success rates. To maintain a focus on student success, it is important that we increase the extent to which we effectively assess progress towards strategic objectives and establish performance metrics that are in alignment with strategic goals. One element of a successful approach to this challenge is ensuring that sufficient funds are set aside to support high quality assessment activities and appropriate levels of staffing in offices of assessment (Ewell & Ikenberry, 2015). High quality assessment findings must be communicated with those responsible for budget decisions in order to successfully align assessment findings and budget allocations. We encourage institutions to take steps towards increasing the integration of planning, assessment, and budgeting.

Immediate Improvements. Assessment findings should be used to direct immediate pedagogical improvements. Too often, assessment findings are not utilized to direct immediate pedagogical improvements, in part because the work of closing the loop in student learning outcomes assessment is too slow to benefit the students who are assessed or to improve the instruction or course design of those who are teaching (Eubanks, 2017; Maki, 2017). We must find ways to make changes in response to assessment findings within the space of a single class through formative assessments (Dirlam, 2017; López-Pastor & Sicilia-Camacho, 2017; Maki, 2017). The rapid increase in online teaching and adaptive learning provides opportunities for assessments to take place in real time and may result in a shift to individualized instruction (Deeley, 2018; Neuman, 2017). Integration of information about student cognitive skills, social-emotional development, and current academic accomplishments can now be provided rapidly to faculty and students (Baer, 2017). This information can be used to improve pedagogy by providing faculty with information about how their current pedagogy is impacting individual students. If technology provides timely data to students and faculty, these data can support the rapid delivery of interventions to enhance and support student success (Baer, 2017; Shacklock, 2016). To measure the success of immediate pedagogical improvements, it will be important to measure student learning over time and encourage students to reflect on their own learning which might involve expanding the use of ePortfolios to encourage student reflections. As one of the four challenges with broad support, this challenge is currently being addressed by the Grand Challenges in Assessment Project (Singer-Freeman & Robinson, 2020).

Increase Equity. Assessment findings should be used to increase educational equity. A goal in higher education is that every student has an equal opportunity to succeed regardless of ethnicity, gender, socioeconomic status, ability, or family educational history. There is compelling evidence that we are not meeting this goal (Cahalan et al., 2018). We must design and analyze assessments to reveal the extent to which institutions of higher education are providing access to high quality education for all students (Gavin et al., 2018; Jankowski, et al., 2018; Klonoski et al., 2018; Kuh & Ikenberry, 2018; Nunez, 2018; Pasquerella, 2018). There has been increasing attention given to the role of assessment choices in perpetuating equity gaps (Montenegro & Jankowski, 2017a; 2017b; 2020; Singer-Freeman & Bastone, 2019a; Singer-Freeman et al., 2019) and the role that assessment activities play in supporting educational equity in higher education (Blach & Wise, 2018). When we identify educational inequities, we must carefully examine the effects of current practices on underserved groups, viewing the gaps as resulting from

We encourage institutions to take steps towards increasing the integration of planning, assessment, and budgeting.

failures of practice rather than students' problems (Malcom-Piqueux, 2018). We must also consider ways to make the assessment process itself fair. To effectively increase equity in higher education, we must increase our use of data disaggregation. As the challenge with the broadest support, the challenge of increasing equity is currently being addressed by the Grand Challenges in Assessment Project (Singer-Freeman & Robinson, 2020).

Disaggregate Data. Data on learning should be disaggregated to consider important student characteristics. For the most part, assessment data are reported and reviewed in ways that mask inequities because student learning outcome reports aggregate assessment results across all sections of courses and instructors. To reveal the extent to which institutions of higher education are providing equal education to all students, we must examine disaggregated outcome results (Garrigan et al., 2018; Gavin et al., 2018; Harper et al., 2018; Klonoski et al., 2018; Singer-Freeman et al., 2019). Yet, a NILOA survey of provosts revealed that the use of assessment data to improve educational equity in higher education is uncommon (Jankowski et al., 2018). Disaggregation along with the consideration of other variables, including previous educational experiences, can also be used to assess the extent to which curricular and co-curricular experiences support student success (Brown, 2017; McNair, 2018). As we increase the use of disaggregation practices, we must carefully consider which groupings of students are appropriate. For example, we lump a large number of ethnicities into the group "Asian American." When groupings are too broad, we cannot assume that what is revealed is true for everyone in that group. Maximally useful data disaggregation would be supported by the availability of large data sets. We encourage institutions to increase the disaggregation of student learning outcome assessment results to reveal whether the attainment of learning is equitable across the institution.

Change Over Time. To identify progress, it is essential to examine changes in institutional effectiveness (including student learning) over time. Strategic planning in business effectively supports continuous improvement because of rigorous follow-up which includes monitoring progress towards goals, attending to changes in market conditions, and responding by resetting tactics (Gordon & Fischer, 2015). Unfortunately, higher education strategic planning can be ineffective at driving improvement because of limited follow-up (Gordon & Fischer, 2015). Gordon and Fischer (2015) found that in higher education, strategic planning is frequently viewed as a task that must be completed to meet accreditation standards and that strategic plans are often viewed as a means of communicating with an external audience rather than as realistic plans for future activities. To maximize the usefulness of strategic plans, there must be meaningful tracking of progress towards institutional effectiveness goals over time (Harvey, 2017; Jorgensen, 2018; Suskie, 2015) and linkages between strategic planning and budget allocations. One key element of tracking institutional effectiveness is the measurement of individual students' learning (Eubanks, 2019a; 2019b; Hundley, 2019; Jankowski & Marshall, 2017). This might include tracking of long-term outcomes-based performance measures including successfully paying off student loans, post-graduation earnings, and research or innovation that benefits society (Baer, 2017; Miller, 2016; Pasquerella, 2018; Rickards & Stitt-Bergh, 2016). If we are to track learning over time effectively, we must increase the use of technology that provides longitudinal student data. This might involve the expanded use of ePortfolios that document student learning over time or the use of more sophisticated databases and analyses. As one of the four challenges with broad support, this challenge is currently being addressed by the Grand Challenges in Assessment Project (Singer-Freeman & Robinson, 2020).



Student Self-Evaluation. Involving students in authentic self-evaluation of their own learning enhances the learning process. A key element of student learning that may predict students' long-term success is their capacity to learn (Boud & Soler, 2016). To develop a capacity for learning, it is helpful for students to become explicitly aware of their learning (Havnes & Proitz, 2016). Students who engage in self-assessments become more aware of their own learning and feel a sense of ownership over this learning. Additionally, students' assessment of their own learning provide rich evidence of learning that can be used for improvement (Bourke, 2018; López-Pastor & Sicilia-Camacho, 2017; Lurie & Garrett, 2017; Zeng et al., 2018). Competency-based education or ePortfolios are ways to encourage students to evaluate their learning and increase their awareness of accomplishments (Singer-Freeman & Bastone, 2019b). Dann (2014) links the use of self-assessment activities to increased curiosity, awareness of learning gaps, and self-regulation around educational efforts. A new model of the student as a partner and change agent in assessment has emerged (Healey et al., 2014) in which student self-reflections improve our understanding of more traditional assessment results. To fully integrate self-evaluation of learning into pedagogy, it will also be important to provide faculty with training on best practices in evaluative student reflections. Increasing student self-evaluations has the potential to improve both student learning and the assessment of student learning. We encourage institutions to consider including reflective questions as part of the assessment of student learning.

ePortfolios. Increasing the use of ePortfolios can capture student learning over the entire span of their educational career. ePortfolios provide students with a place to collect examples of their work, reflect on their progress towards personal and educational goals, and share their work with faculty, family, and future employers. ePortfolio practice was recently added to the list of High Impact Practices (HIPs) (Watson et al., 2016). HIPs describe a wide range of college experiences that have been shown to increase rates of student retention and engagement. ePortfolios are hypothesized to function as a meta-HIP by increasing the impact of other HIPs such as undergraduate research, learning communities, internships, writing-intensive classes, and study abroad (Kuh et al., 2018). ePortfolio practice has become increasingly common in institutions of higher education with over half of U.S. colleges reporting ePortfolio use to capture students' learning (Eynon & Gambino, 2017). ePortfolio use is likely to increase as employers report that they find them to be more useful than resumes for hiring decisions (Hart Research Associates, 2018; Watson & McConnell, 2018). At the heart of ePortfolio practice is the documentation of and reflection on learning. Reflection on learning supports students' self-evaluative abilities (Singer-Freeman & Bastone, 2019b). A high quality ePortfolio curates curricular and co-curricular experiences into a cohesive picture of a student's education. As such, it has the potential to document the full range of learning that students experience across time and different institutions (Hundley, 2019; Kinzie & Jankowski, 2015). When ePortfolios are created over the full span of a student's educational experiences they can be used to measure changes in learning over time. ePortfolios also stimulate and measure students' awareness of their own learning (Singer-Freeman & Bastone, 2018; 2019a; 2019b). Reflection is increasingly viewed as an essential element of higher education (Hutchings, 2018). The fact that ePortfolios encourage and document reflection positions them to be a significant tool for both assessment and learning improvement (Hutchings et al., 2015). We encourage institutions to increase the use of ePortfolios to provide students with documentation of their own learning over time and to provide them with opportunities to reflect on their learning.

We encourage institutions to increase the use of ePortfolios to provide students with documentation of their own learning over time and to provide them with opportunities to reflect on their learning.

Massive Data. It is time to consider leveraging technology to analyze massive data sets within and across institutions. In so doing, we may improve the quality of our data and the sophistication of our analyses to maximize the usefulness of assessment findings (Avella et al., 2016; Baer, 2017; Brown, 2017; Eubanks, 2019a; 2019b). Evolving technologies (e.g., MOOCs, course management systems, artificial intelligence, and adaptive learning platforms) now collect large data sets with a wide range of variables including individual assignment and problem grades, time spent on tasks, and use of linked resources. These data present institutions with opportunities to look in more nuanced ways at evidence of learning (Dirlam, 2017; Pena, 2018; Suskie, 2016), including disaggregation and effects of prior learning. Technology also could enable small institutions to conduct higher quality assessment by sharing data, data systems and assessment personnel (Ariovich et al., 2019). A crucial step towards analyses that span institutional boundaries will be consensus on what should be measured, what common metrics might be used, and how the resulting findings will be ethically and purposefully used (Banta et al., 2016; Lingenfelter, 2016). Competency-based education (CBE) might be one approach to the creation of uniform metrics that can be compared and transferred between institutions, however; there are currently many different approaches to measuring competencies. Lurie and Garrett (2017) describe current implementation of competency-based education stating “There is a tension between the logic of CBE, which pushes a more standardized approach to establishing competencies, curricula, and course content, and the decentralized culture of higher education” (p. 18). This tension captures the general concern among faculty that the desire to create uniformity in metrics may come at the cost of using more authentic forms of measurement of student learning (Braun, 2019). If we successfully address this challenge, we might begin to engage in “meta-assessment” by examining the relative efficacy of different assessment methods and exploring the extent to which assessment findings are driving improvements. We encourage assessment organizations and higher education organizations to consider ways in which they might contribute to cooperation around the determination of metrics and analyses that span institutional boundaries.

Communicate. Finally, effectively communicating relevant, timely, and contextualized information about the full range of experiences to stakeholders will contribute to student learning and success (Hundley, 2019; Jankowski et al., 2018). With attention to the needs of different audiences, we must begin to offer clear information about why we provide students with different experiences in higher education and how those specific experiences benefit students (Jankowski & Cain, 2015; Jankowski & Marshall, 2017). The key to improving assessment is collecting information that informs decisions and effectively communicating this information to all stakeholders (Hutchings et al., 2015). One important element of effective communication might be to make incremental improvements that accumulate over time visible to students and other stakeholders (Stanny, 2018a; 2018b). Reframing assessment as a process of “meaning making” will improve an institution’s ability to communicate with stakeholders effectively (Penn, 2018; Rhodes, 2018; Watson & McConnell, 2018). The most recent strategic plan for the Association of American Colleges and Universities and a recent statement in NILOA Viewpoints (Higher Education Assessment Practitioners, 2018) call for an acceleration in advocacy and outreach. Clear communication is also needed internally. We must improve the extent to which we share meaningful assessment findings with students, faculty, and other stakeholders to accomplish meaningful improvements in response to assessment findings (Horst & Ames, 2018; Kuh & Ikenberry, 2018). Successful progress towards the resolution of any of the other challenges will require improvements in communication in order to identify solutions, generate funding, and coordinate progress towards goals.



Final Words

Assessment in higher education has a range of challenges related to improving measurement, addressing inequities, and fostering continuous improvement. To enable collective solutions to these grand challenges, the shift away from compliance towards assessment for improvement needs to be fully realized. It is clear from the responses of assessment professionals to these challenges (Singer-Freeman & Robinson, 2020) that they are ready to use assessment to increase equity, innovation, pedagogy, and document progress over time. The concept of grand challenges is an effective one for the assessment community because we do have challenges, we cannot solve them alone, and we need the collective efforts of the assessment community in order to move the needle. We hope you will join us in creatively addressing these problems.

*Join us in creatively
addressing the
grand challenges of
assessment.*

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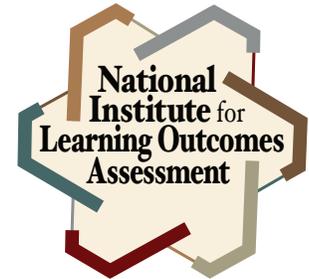
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Dr. Karen Singer-Freeman is the Director of Academic Planning and Assessment in the Office of Assessment and Accreditation at the University of North Carolina at Charlotte where she works with faculty and staff to support program reviews and strategic planning. She co-chairs the Grand Challenges in Assessment Project, a national project to create a strategic plan for assessment in higher education. Dr. Singer-Freeman holds a BA in psychology and anthropology from the University of Michigan, a Ph.D. in cognitive developmental psychology from the University of Minnesota and completed post-doctoral work at Cambridge University and University College London. Previously, Dr. Singer-Freeman served as Chair of the Psychology Department and the director and associate director of NIH/NIGMS funded programs for science students at Purchase College, State University of New York. Dr. Singer-Freeman's research examines effects of classroom assessments on equity gaps and educational interventions that support student success. She received the Purchase College Guiding Light Award for Excellence in Mentorship, the Chancellor's Award for Excellence in Teaching, and was named a Scientific Thinking and Integrative Reasoning Scholar by the Association of American Colleges and Universities.

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About NILOA

- The National Institute for Learning Outcomes Assessment (NILOA) was established in December 2008.
- NILOA is co-located at the University of Illinois and Indiana University.
- The NILOA website contains free assessment resources and can be found at <http://www.learningoutcomesassessment.org>.
- The NILOA research team has scanned institutional websites, surveyed chief academic officers, and commissioned a series of occasional papers.
- NILOA's Founding Director, George Kuh, founded the National Survey for Student Engagement (NSSE).
- The other co-principal investigator for NILOA, Stanley Ikenberry, was president of the University of Illinois from 1979 to 1995 and of the American Council of Education from 1996 to 2001.



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