

## **Grand Challenges for Assessment in Higher Education**

### **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. Four characteristics used to identify grand challenges were adapted from the fields of science and mathematics education: (1) Extremely hard to do, yet doable; (2) Produce positive outcomes potentially affecting large numbers of people; (3) Associated with clear metrics and goals so progress and completion can be identified; and (4) Capture popular imagination, and thus garner political support. To identify grand challenges in assessment we reviewed assessment publications, websites, blogs, and discussion boards and solicited feedback by broadly surveying members of the assessment community ( $n = 231$ ). We describe each challenge with references to recent scholarly writings and report the results of a survey demonstrating broad support for four challenges: 1) Use assessment findings to increase equity; 2) Use assessment findings to direct immediate pedagogical improvements; 3) Produce visible and actionable assessment findings that drive innovation; 4) Examine changes in institutional effectiveness (including student learning) over time. We conclude with a discussion of ways the community might unify to make progress towards the identified grand challenges.

A grand challenge is a problem facing a community of scholars that requires broad cooperation for successful resolution – they are problems that cannot be solved or done alone. Hilbert (1903) initiated the first attempt to identify grand challenges by publishing a list of mathematics problems with the goal of increasing the speed of progress towards solutions. Since that time, a number of national and international organizations have generated lists of grand challenges to unify the efforts of scholars and practitioners in a field (Omenn, 2006). The articulation of grand challenges has proven useful as a means of creating synergistic research efforts around problems to make a positive difference in the world. Examples of effective grand challenges include creating economical sources of solar energy (National Academy of Engineering, 2008), developing renewable fuel alternatives (Chemistry National Research Council, 2005), and including active science inquiry in all introductory college science classes (Alberts, 2013). We believe that the field of assessment in higher education would benefit from the identification of our own set of grand challenges that could organize and motivate progress towards meaningful goals.

The articulation of grand challenges can serve two pressing needs. First, the selection of grand challenges will strengthen the commitment of leaders to improving assessment by supporting communication between assessment professionals, faculty and staff, students, and the broader community. Strong leadership support is essential to increase the use of assessment findings for data-based decision-making (Banta, Ewell, & Cogswell, 2016). Second, unification around a set of grand challenges can serve as the starting point for national strategic planning in which the field coordinates research and practical efforts to address selected challenges. In the current paper we describe the process by which we identified potential grand challenges and gathered results from a national survey of assessment professionals about the potential challenges. We conclude with a discussion of the grand challenges that emerge from this work and suggestions for ways the community might organize to plan for progress in these areas.

Different fields have approached the selection of grand challenges in different ways, including relying on the work of an individual, reviewing current literature, holding symposia, or issuing broad calls for proposals (Gould, 2010). We reviewed the current assessment literature and selected challenges that were mentioned frequently and fulfilled the four defining characteristics of grand challenges. These

characteristics are: (1) Extremely hard to do, yet doable; (2) Produce positive outcomes potentially affecting large numbers of people; (3) Associated with clear metrics and goals so progress and completion can be identified; and (4) Capture popular imagination, and thus garner political support (Gould, 2010; Stephan et al., 2015). We describe our research design and report the results of a broad survey of assessment professionals below.

**Identification of Grand Challenges.** We reviewed assessment websites, blogs, discussion boards and publications from the past four years. We focused on publications within that time frame rather than conducting a more extensive review to maintain a future oriented perspective. This review resulted in the identification of ten potential challenges. We briefly describe the top four challenges and the sources from which they emerged. A brief name for each challenge is provided in parentheses.

**Use assessment findings to increase equity (Increase 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, Perna, Yamashita, Wright, & Santillan, 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, Bolton, Fine, & Morse, 2018; Jankowski, Timmer, Kinzie, & Kuh, 2018; Klonoski, Barker, & Edghill-Walden, 2018; Kuh & Ikenberry, 2018; Nunez, 2018; Pasquerella, 2018). There has been increasing attention given to the role of assessment choices in perpetuating achievement gaps (Montenegro & Jankowski, 2017a; 2017b; Singer-Freeman & Bastone, 2019b; Singer-Freeman, Hobbs, & Robinson, 2019) and the role that assessment activities play in supporting equity in higher education (Blaich & Wise, 2018). When we identify achievement gaps we must carefully examine the effects of current practices on underserved groups, viewing the gaps as resulting from failures of practice rather than students' problems (Malcom-Piqueux, 2018). We must also consider ways to make the assessment process itself more inclusive. Community interest has resulted in a recent call for articles in *Intersection: A journal at the intersection of assessment and learning* and plans to have equity be the central topic at the next Association for the Assessment of Learning in Higher Education conference.

**Use assessment findings to direct immediate pedagogical improvements. (Immediate Improvements)** Too often the work of closing the loop in the assessment of learning outcomes is too slow to benefit the students who are assessed or to result in improvements in 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 that take place in real time and result in shifting individualized instruction (Deeley, 2017; 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. This might involve expanding the use of ePortfolios to encourage student reflections.

**Produce visible and actionable assessment findings that drive innovation (Drive Innovation).**

Innovation requires future-oriented considerations of change that brings together assessment and planning activities (Jorgensen, 2018). The field of assessment has shifted away from conducting assessment to demonstrate compliance and 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, 2018a; Kuh, et al., 2015; Pasquerella, 2018; Roscoe, 2017; Stanny, 2018a; Stanny 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 we gather evidence that informs our understanding of the outcomes associated with innovative practices. 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, Smith, Sanchez, Ames, & Meixner, 2017; Smith, Finney, & Fulcher, 2017; Stitt-Bergh, Kinzie, & Fulcher, 2018). Conducting assessments that determine whether learning improvement has occurred would be supported by analyses of large data sets (see challenge #9). Assessments that drive innovation also require authentic faculty involvement (Neuschel & Rego, 2018; Rickards & Stitt-Bergh, 2016; Roscoe, 2017; Stevenson, Finan, & Martel, 2017; Suskie, 2015). This challenge is related to many other identified challenges. Successful innovations might increase equity or support rapid improvements in pedagogy.

**Examine changes in institutional effectiveness (including student learning) over time (Change over Time).**

Strategic planning in business effectively supports continuous improvement because of rigorous follow-up which includes monitoring of progress towards goals, attention to changes in market conditions, and responsive resetting of 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 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 (see challenge #2). One key element of tracking institutional effectiveness is the measurement of individual students' learning (Eubanks, 2019; 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 expanded use of ePortfolios that document student learning over time or the use of more sophisticated databases and analyses. However, there is also a tension between the need for longitudinal data and the need to make rapid changes in instruction or services to support student success. To resolve this apparent conflict it will be important to identify broad metrics that allow the accurate tracking of progress towards goals in a constantly shifting educational landscape.

**Discussion**

The results of our study identified four challenges with strong support from assessment professionals. The most important challenge to assessment professionals was “*Use assessment findings to increase equity.*” This challenge was listed as a top challenge most frequently, had the highest overall average score across the four characteristics and the highest median rank. “*Produce visible and actionable assessment findings that drive innovation*” and “*Use assessment findings to direct immediate pedagogical improvements*” and “*Examine changes in institutional effectiveness (including student learning) over time*” also emerged as having high levels of support, being listed among the top three challenges for 35%-45% of respondents and receiving high ratings across three characteristics. However, all three were rated lower than other challenges in their ability to “capture the popular imagination, and thus garner political support.”

We observed intermediate levels of support for “*Use assessment findings to inform budgetary initiatives,*” “*Involve students in authentic self-evaluation of their own learning,*” and “*Communicate relevant, timely and contextualized information about student learning to stakeholders.*” These challenges were ranked as among the top three challenges for 26-32% of respondents, and their overall score across characteristics and rankings were significantly lower than the top challenges. Finally, we observed the lowest levels of support for “*Disaggregate data to include important student characteristics,*” “*Use ePortfolios to capture students’ learning over the entire span of their education,*” and “*Leverage technology to analyze massive data sets within and across institutions.*” These challenges were only ranked as among the top three challenges by 11%-16% of respondents. Interestingly, each of these challenges describe a mechanism by which other more highly rated challenges might be achieved. Data disaggregation is an important tool used to increase equity. The analysis of massive data sets is a tool used to produce actionable assessment findings. Finally, ePortfolios are used to examine changes in learning over time and engage students in self-evaluation of learning. We believe this might help to explain why these challenges received lower ratings.

**Future Directions.** We believe that the top challenges that emerged from this study provide confirmation that the field of assessment is motivated to move beyond conducting assessment to demonstrate compliance and is ready to fully embrace the use of assessment for improvement. The participants in this study wish to increase equity, drive innovation, improve pedagogy, and measure progress over time. If we successfully address these challenges we will also successfully transform assessment from being primarily compliance-driven to becoming largely improvement-oriented. The identification of grand challenges is only a starting point. For grand challenges to meet the goal of increasing the speed of progress they must be used to coordinate efforts, strengthen commitment from stakeholders, support communication with the public, and attract funds (Gould, 2010; Stephan et al., 2015; Weiss & Khademian, 2019). Since the completion of this survey we have discussed these challenges at conferences and with individuals who are interested in beginning to work on addressing key challenges. From these meetings we have learned that there is interest in initiating national strategic planning in which the field coordinates research and practical efforts to address selected challenges (132 individuals have expressed an interest in being involved in efforts to make progress on these challenges). The group includes individuals from over 100 colleges or universities, 9 community colleges, and 1 system office. This group includes many full-time assessment professionals from offices of assessment, institutional effectiveness and institutional research as well as faculty members, representatives from professional organizations, and representatives from industry. We have also received endorsements from 8 professional organizations and gathered a leadership team with representation from these organizations. As we move forward in this work it will be necessary to fully define each challenge, determine pathways to success, and identify sources of support. We hope you will join us in this work.

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