



Abstract

A grand challenge is a problem that requires broad cooperation for successful resolution from a community of scholars. Several national and international organizations have generated lists of grand challenges to unify the efforts of scholars and practitioners in a field. However, the field of assessment has yet to identify its own set of grand challenges that could serve to organize and motivate progress toward meaningful goals. This article describes the process by which potential grand challenges were identified and subsequently evaluated by professionals in the field through a national survey. Results of the survey demonstrate broad support for the importance of 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; and 4) Examine changes in institutional effectiveness (including student learning) over time. The article concludes with a discussion of the grand challenges that emerged from this work and a description of an ongoing national effort to address these challenges through strategic planning.

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Grand Challenges for Assessment in Higher Education

A grand challenge is a problem that requires broad cooperation for successful resolution from a community of scholars. Hilbert (1902) first identified grand challenges by publishing a list of mathematics problems with the goal of advancing solution creation. Since that time, national and international organizations have generated lists of grand challenges to unify the efforts of scholars and practitioners at research universities, federal agencies, and non-profit organizations (Omenn, 2006; Popowitz & Dorgelo, 2018; Uehara et al., 2014; Varmus et al., 2003). The articulation of grand challenges has proven useful as a means of creating synergistic research efforts to make a positive difference in the world. Examples of effective grand challenges include 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). However, the field of assessment has yet to identify its own set of grand challenges that could serve to organize and motivate progress. In this study, we sought to identify compelling grand challenges for the field of higher education assessment.

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Why Grand Challenges?

There is a pressing need to improve perceptions about the value of assessment in higher education. In a recent survey of chief academic officers, nearly a third believed their college's assessment efforts were more about keeping politicians and accreditors happy than improving teaching and learning, and nearly a fifth disagreed that assessment

systems have improved the quality of teaching and learning (Jaschik & Lederman, 2020). Assessment professionals report disliking the need to persuade others about the value of assessment (Ariovich et al., 2018). Recent surveys of assessment professionals have focused primarily on demographics, salary, and job responsibilities (Ariovich et al., 2018; Combs & Rose, 2016; Nichols & Slotnick, 2018). To date, there has not been a survey of assessment professionals' beliefs about important future directions for the field. The identification of grand challenges described in this paper served as the starting point for national strategic planning, in which the assessment field will coordinate research and practical efforts to increase the use of assessment findings for improvements in teaching and learning. This national planning effort, which is currently underway, will strengthen the commitment of higher education leaders by improving the quality of assessment and publicizing the positive impact of quality assessment. Strong leadership buy in is essential to increase use of assessment findings in data-driven decision-making (Banta et al., 2016).

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This article describes the process by which potential grand challenges were identified through a national survey of higher education assessment professionals. The survey was conducted by the authors, without support from any organizations. However, since the completion of the survey, the Grand Challenges in Assessment Project has received 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, National Association of Student Personnel Administrators, National Institute of Learning Outcomes Assessment, and Student Affairs Assessment Leaders). The paper concludes with a discussion of the grand challenges that emerged from this project and a description of the Grand Challenges in Assessment Project.

Method

Different fields have approached the selection of grand challenges in different ways, including relying on the work of a single individual, reviewing current literature, holding symposia, or issuing broad calls for proposals (Gould, 2010). For the development of the survey, the authors reviewed current assessment literature and selected challenges that were mentioned frequently. The four characteristics used to identify grand challenges were: (1) Is extremely hard to do, yet doable; (2) Would produce positive outcomes potentially affecting large numbers of people; (3) Is associated with clear metrics and goals so progress and completion can be identified; and (4) Would capture popular imagination, and thus garner political support (Gould, 2010; Stephan et al., 2015). To identify the challenges for inclusion in the survey, the authors reviewed assessment websites, blogs, discussion boards, and publications from 2015 to 2019. Focusing on publications within that specific time frame, rather than conducting a more extensive review, maintained a future-oriented perspective for challenge identification. We chose to include peer-reviewed and non-peer-reviewed publications, blogs, and discussion boards in our review to identify challenges that were generating practical interest, as well as challenges that were discussed in the published literature. In total, we reviewed 83 pieces of writing that included 46 non-peer-reviewed sources, 34 peer-reviewed sources, and 3 blog or discussion board posts. The total number and distributions of materials reviewed is shown in Table 1.

As we read each source, we noted all challenges facing the field of assessment that fulfilled the four defining characteristics of the grand challenges described above. The review resulted in the identification of 10 potential challenges, described in Table 2. Most sources referenced more than one of the 10 challenges that were identified. As shown in Table 2, all challenges were referenced in multiple sources. A full description of these challenges can be found in Singer-Freeman and Robinson (2020).

Survey Instrument, Sampling, and Administration

Drafted survey items, which emerged from the literature review, were shared with one assessment professional employed at a community college, one college administrator at a four-year college, and five staff members from a national assessment organization. These

Table 1
Sources Reviewed to Identify Grand Challenges in Assessment Listed in Order of Frequency

Source	References
34 peer-reviewed sources	
<i>Research & Practice in Assessment</i>	6
<i>Assessment & Evaluation in Higher Education</i>	4
<i>Intersection</i>	4
<i>Emerging Dialogues</i>	3
<i>Educational Assessment, Evaluation and Accountability</i>	2
<i>International Journal of ePortfolio</i>	2
<i>Planning for Higher Education</i>	2
<i>Assessment in Education: Principles, Policy, & Practice</i>	1
<i>British Journal of Educational Psychology</i>	1
<i>Journal of Competency-Based Education</i>	1
<i>Educational Planning</i>	1
<i>Journal of Biochemistry and Molecular Biology Education</i>	1
<i>Journal of General Education</i>	1
<i>Journal of Higher Education</i>	1
<i>New Directions for Evaluation</i>	1
<i>Online Learning Journal</i>	1
<i>Journal of Teaching and Learning</i>	1
<i>Urban Education</i>	1
46 non-peer-reviewed sources	
<i>Assessment Update</i>	13
<i>Book Chapters</i>	8
<i>Liberal Education</i>	6
<i>NILOA publications and Occasional Papers</i>	6
<i>AAC&U Reports</i>	5
<i>Viewpoints</i>	3
<i>American Council on Education</i>	1
<i>Inside Higher Education</i>	1
<i>London: Higher Education Commission</i>	1
<i>Lumina Issue Paper</i>	1
<i>Pell Institute for the Study of Opportunity in Higher Education</i>	1
3 blogs and discussion board posts	
<i>Linda Suskie Blog</i>	2
<i>Educause Review</i>	1

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individuals were selected to represent a range of institutional perspectives on assessment. The items were revised in response to their feedback. The final survey contained 44 4-point Likert scale questions (responses: “not at all” = 1, “a little” = 2, “to some extent” = 3, “very much” = 4). Respondents evaluated the extent to which each of the 10 identified grand challenges could be described using each of the four characteristics (Is extremely hard to do, yet doable; Would produce positive outcomes potentially affecting large numbers of people; Is associated with clear metrics and goals so that progress and completion can be identified; and Would capture the popular imagination, and thus garner political support). After evaluating the different challenges, respondents were asked to rank the overall importance of the 10 grand challenges. The survey also included two open-ended questions. The first asked for additions, deletions, or changes to the characteristics of grand challenges. The second asked participants to suggest an additional challenge, if so desired. The survey also included eight demographic questions. The complete survey is included in the Appendix.

Invitations to complete the survey were shared on assessment listservs (ASSESS, AAHLE, SAA-Leaders), the authors’ LinkedIn accounts, and in the National Institute for Learning Outcomes Assessment (NILOA) newsletter. The authors also sent email invitations to personal contacts and requested that all recipients distribute the survey invitation to others in the field. After providing informed consent, participants completed the survey. Initially, the survey was set to require responses to all questions. However, in

Table 2
Challenges Identified from Review of Recent Scholarly Work

Short title	Full challenge	Referenced
RELATED TO CONTINUOUS IMPROVEMENT		
1. DRIVE INNOVATION	Produce visible and actionable assessment findings that drive innovation.	22
2. INFORM BUDGET	Use assessment findings to inform budgetary initiatives	6
3. IMMEDIATE IMPROVEMENTS	Use assessment findings to direct immediate pedagogical improvements.	8
RELATED TO ADDRESSING INEQUITIES		
4. INCREASE EQUITY	Use assessment findings to increase equity.	12
5. DISAGGREGATE DATA	Disaggregate data to include important student characteristics.	8
RELATED TO IMPROVING MEASUREMENT		
6. CHANGE OVER TIME	Examine changes in institutional effectiveness (including student learning) over time.	11
7. STUDENT SELF-EVALUATION	Involve students in authentic self-evaluation of their learning.	8
8. ePORTFOLIOS	Use ePortfolios to capture students' learning over the entire span of their education.	11
9. MASSIVE DATA	Leverage technology to analyze massive data sets within and across institutions.	12
10. COMMUNICATE	Communicate relevant, timely, and contextualized information about student learning to stakeholders.	13

response to constructive feedback from several respondents in the first week of the launch, the questionnaire was reset to allow participants to skip any item. Participants spent between four and 76 minutes on the survey, with an average completion time of 14.66 minutes ($SD = 10.73$).

Participants

A total of 231 individuals submitted completed or partially completed surveys. An additional 176 individuals followed the link to the survey but did not complete or submit the survey. Because the survey was advertised broadly, it is difficult to calculate an accurate response rate. Of the individuals who followed the link, the response rate was 57%. A popular listserv that we used for distribution, ASSESS, is reported to have over 1,500 subscribers (Fuller et al., 2015). Assuming most assessment professionals we reached through other forms of outreach also subscribe to this listserv, that would result in a response rate of 15%. All submitted surveys were included in analyses, including those that were only partially completed. We received responses to the eight individual demographic questions from between 204 and 216 participants. Participants reported spending between two and 47 years employed in higher education with an average of 18.41 years ($SD = 9.34$). Participants reported spending between zero and 40 years involved in assessment activities with an average

The challenge “Increase Equity” received the highest average score ($M = 3.20$), which was significantly higher than the average scores received for all other challenges, except “Drive Innovation” ($M = 3.08$) and “Change Over Time” ($M = 3.05$).

of 11.73 years ($SD = 8.28$). Most participants (72%) reported working at public institutions of higher education, with less representation from other types of institution (27% private non-profit institutions and less than 2% for-profit institutions). Participants who selected multiple positions were included in all groups they selected. Most respondents reported working primarily in administrative roles (78%), with less representation from respondents in other roles (13% teaching, 12% research, 6% combined position, 3% professional organization, and 1% accrediting organization). Participants reported their gender as female (70%), male (29%), and genderqueer (1%). Participants who selected multiple race and ethnicity categories were included in all groups they selected. Participants reported their ethnicity and race as White (86%), Black or African American (10%), Asian (3%), Hispanic or Latino (2%), American Indian (2%), and Pacific Islander (less than 1%). Our sample was smaller than some other recent surveys (See Table 3); however, we believe our sample represents the assessment community and note that our sample shares similar demographics with other samples (Combs & Rose, 2016; Nichols & Slotnick, 2018).

Table 3
Comparison of Current Sample to Other Surveys of Assessment Professionals

	n	% primarily administrator	% primarily faculty or research	% White
Our Sample	231	78	23	86
Nichols & Slotnick (2018)	324	84	16	89
Ariovich et al. (2016)	1074	57	43	
Combs & Rose (2016)	377	81	5	
Frew et al. (2007)	203	> 66		

Results

Comprehensiveness of Characteristics Used to Assess Grand Challenges

When given the opportunity to suggest additions, deletions, or changes to the characteristics used to assess grand challenges (see above for characteristics), 177 participants (77%) provided no response or indicated that no changes were needed, and 54 (23%) provided suggestions. There were 34 suggestions of additional characteristics. One predominant theme emerged: Support sustainability of high-quality assessment by engaging broad participation or overcoming negativity (15 responses). In addition, there were 14 suggestions about ways to rephrase specific characteristics and seven concerns about whether the characteristics were a good fit for the field of assessment. Because data collection was complete, no actions were taken to alter the characteristics used to evaluate the challenges in response to these suggestions.

Extent to Which Grand Challenges Fulfill Each Characteristic

To investigate participant responses to the 10 challenges, we assigned each Likert response an ordinal score (“not at all” = 1, “a little” = 2, “to some extent” = 3, “very much” = 4) and calculated the average rating of the extent to which participants reported the four characteristics could be applied to each challenge. These scores are reported along with standard deviations in Table 4. Scores ranged from 1 to 4 on all items. An average score across the four characteristics of grand challenges measures the extent to which a challenge holistically exemplifies the characteristics of grand challenges. The use of parametric analyses has been deemed appropriate for aggregated Likert ratings (Harpe, 2015). To test for differences in the extent to which the 10 challenges met the characteristics of grand challenges, a single-factor within-subjects Analysis of Variance (ANOVA) was performed on the average rating for each challenge. Mauchly’s test indicated that the assumption of sphericity had been violated ($\chi^2(44) = 141.96, p < .01$); therefore, degrees of freedom were corrected using Huynh-Feldt estimates of sphericity ($\epsilon = .90$). A significant difference was found between the 10 challenges, Wilks’ $\chi^2 = .62, F(8.07, 1662.91) = 14.45, p < .001$ with a small effect size (Partial Eta Squared = .07). The results of post hoc comparisons using the Bonferroni correction are shown in Table 4. The challenge “Increase Equity” received the highest average score ($M = 3.20$), which was significantly higher than the average scores

received for all other challenges, except “Drive Innovation” ($M = 3.08$) and “Change Over Time” ($M = 3.05$). The challenge “ePortfolio” received the lowest average score ($M = 2.73$), which was significantly lower than the average scores received for all other challenges, except “Inform Budget” ($M = 2.90$). The remaining five challenges did not significantly differ from each other, with means ranging from 2.93 to 3.04.

To test for differences in the extent to which the four characteristics of grand challenges were applied to the challenges, a single-factor within-subjects ANOVA was performed on the average rating for each characteristic. Mauchly’s test indicated that the assumption of sphericity had been violated ($\chi^2(5) = 55.60, p < .01$), therefore degrees of freedom were corrected using Huynh-Feldt estimates of sphericity ($\epsilon = .88$). A significant difference was found between the four challenges, Wilks’ $\lambda = .53 F(2.64, 603.32) = 46.17, p < .001$ with a large effect size (Partial Eta Squared = .47). The results of post hoc comparisons using the Bonferroni correction are shown in Table 4. Participants indicated the challenges most strongly fulfilled the characteristic “Would produce positive outcomes potentially affecting large numbers of people” ($M = 3.23$). This characteristic received significantly higher ratings than the other three characteristics. Participants indicated the challenges least strongly fulfilled the characteristic “Would capture the popular imagination, and thus garner political support” ($M = 2.77$). This characteristic received significantly lower ratings than the other three characteristics. The characteristics “Is extremely hard to do, yet doable” and “Is associated with clear metrics and goals so that progress and completion can be identified” received intermediate mean scores of 3.02 and 2.97 respectively and did not differ significantly from each other.

Participants indicated the challenges most strongly fulfilled the characteristic “Would produce positive outcomes potentially affecting large numbers of people” ($M = 3.23$).

Table 4
Extent to Which Challenges Fulfill Characteristics of Grand Challenges

Challenge	Hard but Doable	Positive Outcomes	Clear Metrics	Popular	Average
Increase Equity	3.12 (.87)	3.54 (.73)	3.04 (.88)	3.23 (.86)	3.20 _a (.60)
Drive Innovation	3.05 (.78)	3.35 (.75)	2.99 (.96)	2.91 (.86)	3.08 _{ab} (.60)
Change Over Time	3.16 (.83)	3.27 (.79)	3.01 (.93)	2.77 (.95)	3.05 _{abc} (.66)
Massive Data	3.23 (.83)	3.28 (.77)	2.93 (.90)	2.93 (.88)	3.04 _{bc} (.63)
Immediate Improvements	3.09 (.89)	3.40 (.74)	3.07 (.81)	2.60 (.97)	3.01 _{bc} (.59)
Disaggregate Data	2.82 (1.02)	3.21 (.81)	3.10 (.89)	2.80 (.86)	2.95 _c (.63)
Student Self-Evaluation	2.97 (.87)	3.23 (.85)	2.92 (.88)	2.58 (.94)	2.94 _c (.60)
Communicate	3.01 (.92)	3.09 (.77)	2.85 (.88)	2.80 (.93)	2.93 _c (.63)
Inform Budget	2.91 (.93)	3.04 (.80)	2.95 (.91)	2.61 (.94)	2.90 _{cd} (.62)
ePortfolios	2.84 (1.01)	2.88 (.85)	2.83 (.95)	2.42 (.93)	2.73 _d (.71)
Average	3.02 _c (.04)	3.23 (.04)	2.97 _c (.05)	2.77 (.05)	

Note: Challenges are listed in order of overall score with standard deviations reported in parentheses. Means that do not share subscripts differ at $p < .05$ with the Bonferroni correction.

Rankings of Grand Challenges

In addition to rating challenges using the four characteristics, participants ranked all 10 challenges in order of importance. Table 5 reports the percentage of participants who ranked each challenge as either the top challenge or among the top three. Challenges are ordered from the most to least frequently listed in the top three positions. Table 5 demonstrates a similar pattern as seen in the average scores: Challenges “Increase Equity,” “Drive Innovation,” and “Change Over Time” were frequently considered among the top three challenges. However, unlike the results of average scores, “Immediate Improvements,” appeared frequently among the top challenges and “Massive Data” was rarely listed among the top challenges.

To determine whether the differences in rankings were significant, a Friedman test was calculated on rankings which indicated a significant difference, $\chi^2(9, n = 212) = 246.55, p < .001$. Average and median rankings for each challenge are reported in Table 6. Inspection of average rankings revealed four gaps of greater than .60 between challenges “Increase Equity,”

Table 5
Percentage of participants selecting each challenge among the most important challenges

Challenge	% listed in top 3 challenges	% listed in top challenge
Increase Equity	51	21
Immediate Improvement	45	16
Drive Innovation	43	16
Change Over Time	35	8
Student Self-evaluation	32	16
Communicate	28	11
Inform Budget	26	8
Disaggregate Data	16	1
ePortfolios	12	1
Massive Data	11	2

Table 6
Average and Median Rankings of Challenges

Challenge	Median ranking	Average ranking	Standard deviation
Increase Equity	3	4.23	2.87
Drive Innovation	4	4.43	2.66
Immediate Improvement	4	4.21	2.53
Change Over Time	5	4.91	2.43
Communicate	5	5.15	3.00
Student Self-evaluation	5	5.32	2.98
Inform Budget	6	6.83	2.73
Disaggregate Data	6	6.92	2.33
Massive Data	7	7.49	2.69
ePortfolios	8	8.48	2.66

Note: Challenges are listed in order of average ranking. Line breaks indicate significant differences between Challenges.

The first and most common theme was the need to improve the culture of assessment. This theme was expressed by 66 participants (29% of the total sample) and included suggestions regarding the need to increase buy-in, reduce fear or negativity, integrate assessment with teaching, and engage groups of stakeholders.

“Change Over Time,” “Inform Budget,” “Massive Data,” and “ePortfolios.” Accordingly, four Wilcoxon Signed-Rank Tests were calculated, comparing challenge “Increase Equity” to “Change Over Time,” challenge “Change Over Time” to “Inform Budget,” challenge “Inform Budget” to “Massive Data,” and challenge “Massive Data” to “ePortfolios.” Using a Bonferonni adjusted alpha value of .0125 no significant difference was found between challenge “Increase Equity” and “Change Over Time” ($z = 2.40, p = .02, ns$) or between challenge “Massive Data” and “ePortfolios” ($z = 1.81, p = .07, ns$). However, significant differences were observed between “Change Over Time” and “Inform Budget,” $z = 3.72, p < .001$ and between challenge “Inform Budget” and “Massive Data,” $z = 4.55, p < .001$.

Additional Challenges

In addition to collecting ratings of the 10 challenges, we provided space for participants to propose a challenge. We coded these responses using the grounded theory approach (Charmaz, 2014). This approach includes two phases of coding. During the first phase, narrative data is labeled and categorized according to themes. During the second phase, the labeled categories are reviewed and finalized. The first author grouped the suggestions into categories based on similarity of responses. In instances in which a response included more than one theme, it was divided into separate phrases to group each theme with similar responses. The second author then reviewed the groupings. There were no disagreements in the coding of these responses. A total of 135 suggestions were received (42% of total sample), which were classified into six broad themes. Sample qualitative responses for each theme are reported in Table 7.

As shown in Table 7, the first and most common theme was the need to improve the culture of assessment. This theme was expressed by 66 participants (29% of the total sample) and included suggestions regarding the need to increase buy-in, reduce fear or

Table 7
Sample Challenges Proposed by Participants

Theme	Sample response
Improve Culture of Assessment	Increase buy in. There are too many people who don't see the value. Build assessment into the ongoing, regular routines of higher education. See assessment as an important part of effective teaching and learning.
Improve Measurement of Learning	Determine ways to measure and encourage deep student learning. Develop tools to evaluate learning that are meaningful and actionable. Demonstrate student learning that occurs outside of the classroom.
Use Findings to Improve Learning	Shift focus from box checking towards learning improvement. Use results to improve educational programs. Consistently closing the loop with assessment findings.
Assess Learning Over Time and Across Institutions	Develop valid and reliable assessments for use by multiple institutions. Measure achievement across courses, majors, institutions and over time. Track far-transfer and longitudinal learning.
Increase Resources for Assessment	Financial and human investment in assessment activities. Make assessment less expensive (money and human resources).
Increase Equity for Specific Groups	Use data to remove systemic barriers for marginalized groups. Make race, gender, and SES non-predictive of STEM persistence.

negativity, integrate assessment with teaching, and engage groups of stakeholders. The second theme, which was expressed by 28 participants (12% of total sample), was to improve the measurement of student learning. Participants mentioned the need to consider adopting standard forms of measurement, making comparisons across institutions, and improving the validity and reliability of measures. The third theme, which was expressed by 14 participants (6% of the total sample), was to increase the use of assessment findings to improve student learning. The fourth theme, which was expressed by 13 participants (6% of the total sample), was to increase the assessment of learning over time and across institutions. Several of these suggestions included elements that were similar to “Change Over Time” but included references to specific long-term outcomes of interest, such as graduation rates and employment outcomes. Finally, seven responses (3% of the total sample) indicated a need for increased financial resources to support assessment or less expensive means of assessing student learning, and six responses (3% of the total sample) referred to the need to increase equity for specific underserved groups.

Discussion

This study was designed to identify the most pressing grand challenges facing the field of assessment in higher education. A review of recent literature revealed active consideration of 10 important challenges facing the field, which were ranked and evaluated by assessment professionals using four characteristics of grand challenges (Singer-Freeman & Robinson, 2020). Some interesting differences emerged regarding how assessment professionals viewed the characteristics of grand challenges, as they relate to assessment. Assessment professionals were most confident that addressing assessment challenges could “produce positive outcomes potentially affecting large numbers of people.” However, assessment professionals were less confident that the challenges would “capture the popular imagination, and thus garner political support.” Although the challenge “Communicate” did not emerge as a highly endorsed challenge, limited confidence that assessment challenges will “capture the popular imagination, and thus garner political support,” may indicate that there is a need to improve communication about the benefits of assessment with individuals outside of higher education.

To learn more about assessment professionals’ beliefs about how the characteristics of grand challenges should be weighted, audience members at a national assessment conference presentation completed a brief survey in which they reported whether the four characteristics

Assessment professionals were most confident that addressing assessment challenges could produce positive outcomes potentially affecting large numbers of people. However, assessment professionals were less confident that the challenges would capture the popular imagination, and thus garner political support.

We view existing educational equity gaps as resulting from failures of practice and are exploring ways assessment and assignment choices can support increased equity in higher education

should be given equal weight, and if not weighed equally, describe how they should be ranked (prior to the presentation of survey results). Among the 16 attendees who provided feedback, all reported that the characteristics should not be given equal weight. There was a strong consensus that “produce positive outcomes potentially affecting large numbers of people” and “associated with clear metrics and goals so progress and completion can be identified” were more important than being “extremely hard to do, yet doable” or “capture popular imagination, and thus garner political support.” Thus, from this small sample, it appears that the characteristics survey respondents felt most fully described the challenges were also the characteristics assessment professionals believe to be the most important.

The survey results identified four challenges that have strong support from assessment professionals. “Use assessment findings to increase equity,” which was listed as a top challenge by 51% of respondents, had the highest overall average score across the four characteristics and the highest median rank. As we work to address this challenge in the Grand Challenges in Assessment Project, we are investigating effects of current practices on underserved groups. We view existing educational equity gaps as resulting from failures of practice and are exploring ways assessment and assignment choices can support increased equity in higher education (Blaich & Wise, 2018; Malcom-Piqueux, 2018; Montenegro & Jankowski, 2017; 2020; Singer-Freeman & Bastone, 2019; Singer-Freeman et al., 2019).

The challenge “Produce visible and actionable assessment findings that drive innovation,” was listed as a top challenge by 43% of respondents and did not differ from the “Increase Equity” challenge in overall average score or rank. This challenge is related to other highly rated challenges. Successful innovations might increase equity or support rapid improvements in pedagogy. As we work to address this challenge in the Grand Challenges in Assessment Project, we are seeking ways to improve assessment methodology so that we gather evidence that informs our understanding of the outcomes associated with innovative practices. We are reviewing strategies that engage faculty partners to identify causes of gaps in student learning, identify evidence-based solutions, 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; Stevenson et al., 2017; Stitt-Bergh et al., 2018).

The challenge “Examine changes in institutional effectiveness (including student learning) over time” was listed as a top challenge by 35% of respondents and did not differ from the “Increase Equity” challenge in overall average score or rank. As we work to address this challenge in the Grand Challenges in Assessment Project, we are reviewing strategies to improve measurement and tracking of individual students’ learning (Baer, 2017; Eubanks, 2019; Miller, 2016; Pasquerella, 2018) as well as progress toward broad institutional goals. To track learning over time effectively, we must find better sources of longitudinal student data. 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 tension, it will be important to identify broad metrics that allow the accurate tracking of progress toward goals in a constantly shifting educational landscape.

Finally, the challenge “Use assessment findings to direct immediate pedagogical improvements” was listed as a top challenge by 45% of respondents and did not differ from the “Increase Equity” challenge in median ranking; however, it received a lower overall score than the “Increase Equity” challenge. As we work to address this challenge in the Grand Challenges in Assessment Project, we are seeking to identify new models and methods of assessment and accountability that use relevant findings to make immediate pedagogical changes (Eubanks, 2017; Maki, 2017). To identify effective models, we are evaluating practices and technologies from a range of disciplines, considering socio-cognitive factors that influence student learning, and seeking effective measures of student learning over time (Eynon & Gambino, 2017; López-Pastor & Sicilia-Camacho 2017).

Intermediate levels of support were observed for challenges “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 only 26 to 32% of respondents, and their overall scores across characteristics and rankings were significantly lower than those for the challenge “Increase Equity.” Finally, the lowest levels of support were observed for challenges “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 to 16% of respondents. Interestingly, each of these challenges describe a mechanism by which other, more highly-rated challenges might be achieved. For instance, data disaggregation is an important tool employed to increase equity, and the analysis of massive data sets is a tool that can be 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. It may be the connected nature of those challenges as enablers of other challenges that led to the lower ratings.

Limitations

Although we found clear patterns of support for certain challenges in the current study, our findings are limited by the use of a survey design. Because the challenges were listed without detailed descriptions of the research literature from which they emerged, it is possible that individuals differed in their interpretation of the stated challenges in ways that influenced their rankings and ratings. We were also limited by the relatively small number of responses to our survey. In particular, we lacked adequate representation from Asian and Hispanic or Latinx assessment professionals and professionals employed at private, non-profit institutions of higher education.

Future Directions

The top challenges that emerged from this study provide confirmation that the field of assessment has moved 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. The identification of grand challenges is only a starting point. For grand challenges to increase the speed of progress in the field of assessment 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 launched the Grand Challenges in Assessment Project to create strategic plans that will coordinate research and practical efforts to address the four challenges with the broadest support. The project has endorsements from nine national organizations. Nearly 100 faculty, staff, and students are collaborating in four working groups to create national strategic plans to address the top four challenges identified in the survey. This work is being overseen and supported by a steering committee with representation from each of the endorsing organizations. The working groups include full-time assessment professionals from offices of assessment, institutional effectiveness, and institutional research, as well as faculty members, students, representatives from professional organizations, and representatives from higher education organizations. There is also representation from all types of institutions of higher education from all accrediting regions. The represented institutions include private, public, religious, historically black colleges and universities, community colleges, liberal arts colleges, and research universities. After fully defining each challenge, working groups researched evidence-based routes to improvement, and are currently creating actionable strategic plans for improvement that can be enacted both nationally and locally.

The top challenges that emerged from this study provide confirmation that the field of assessment has moved beyond conducting assessment to demonstrate compliance and is ready to fully embrace the use of assessment for improvement.

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Appendix

Grand Challenges Survey

Dear Colleague,

I hope you will take a few minutes to consider helping us to identify and prioritize grand challenges facing assessment professionals. A number of national and international organizations have compiled lists of grand challenges in their fields. For example, see Omenn’s (2006) discussion of great challenges in [Science](#). The identification of grand challenges can be a useful process that unifies the efforts of practitioners in a field. Unified efforts increase the possibility of creating meaningful and lasting progress. For the purposes of our work we modified the set of characteristics for grand challenges proposed by Gould (2010) and Stephan et al. (2015) resulting in the following characteristics of grand challenges:

- (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 that progress and completion can be identified
- (4) Capture the popular imagination, and thus garner political support.

Do you believe there should be any additions, deletions, or changes to the characteristics of grand challenges described above? If so, please share your suggestions here.

For each of the following goals, please indicate the extent to which you believe it fulfills the four characteristics of grand challenges.

Involve students in authentic self-evaluation of their own learning.

For each of the following goals, please indicate the extent to which you believe it fulfills the four characteristics of grand challenges.

Involve students in authentic self-evaluation of their own learning.

	Not at all	A little	To some extent	Very much
1) Extremely hard to do, yet doable.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Would produce positive outcomes potentially affecting large numbers of people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Is associated with clear metrics and goals so that progress and completion can be identified.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Would capture the popular imagination, and thus garner political support.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Use assessment findings to increase equity.

	Not at all	A little	To some extent	Very much
1) Extremely hard to do, yet doable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Would produce positive outcomes potentially affecting large numbers of people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Is associated with clear metrics and goals so that progress and completion can be identified.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Would capture the popular imagination, and thus garner political support.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Produce visible and actionable assessment findings that drive innovation.

	Not at all	A little	To some extent	Very much
1) Extremely hard to do, yet doable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Would produce positive outcomes potentially affecting large numbers of people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Is associated with clear metrics and goals so that progress and completion can be identified.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Would capture the popular imagination, and thus garner political support.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Use ePortfolios to capture students' learning over the entire span of their education.

	Not at all	A little	To some extent	Very much
1) Extremely hard to do, yet doable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Would produce positive outcomes potentially affecting large numbers of people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Not at all	A little	To some extent	Very much
3) Is associated with clear metrics and goals so that progress and completion can be identified.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Would capture the popular imagination, and thus garner political support.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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

	Not at all	A little	To some extent	Very much
1) Extremely hard to do, yet doable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Would produce positive outcomes potentially affecting large numbers of people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Is associated with clear metrics and goals so that progress and completion can be identified.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Would capture the popular imagination, and thus garner political support.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Use assessment findings to direct immediate pedagogical improvements.

	Not at all	A little	To some extent	Very much
1) Extremely hard to do, yet doable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Would produce positive outcomes potentially affecting large numbers of people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Is associated with clear metrics and goals so that progress and completion can be identified.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Would capture the popular imagination, and	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Not at all	A little	To some extent	Very much
thus garner political support.				

Use assessment findings to inform budgetary initiatives.

	Not at all	A little	To some extent	Very much
1) Extremely hard to do, yet doable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Would produce positive outcomes potentially affecting large numbers of people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Is associated with clear metrics and goals so that progress and completion can be identified.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Would capture the popular imagination, and thus garner political support.	<input type="radio"/>	<input type="radio"/>		

Disaggregate data to consider important student characteristics.

	Not at all	A little	To some extent	Very much
1) Extremely hard to do, yet doable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Would produce positive outcomes potentially affecting large numbers of people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Is associated with clear metrics and goals so that progress and completion can be identified.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Would capture the popular imagination, and thus garner political support.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Leverage technology to analyze massive data sets within and across institutions.

	Not at all	A little	To some extent	Very much
1) Extremely hard to do, yet doable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Would produce positive outcomes potentially affecting large numbers of people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Is associated with clear metrics and goals so that progress and completion can be identified.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Would capture the popular imagination, and thus garner political support.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Communicate relevant, timely, and contextualized information about student learning to stakeholders.

	Not at all	A little	To some extent	Very much
1) Extremely hard to do, yet doable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2) Would produce positive outcomes potentially affecting large numbers of people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Is associated with clear metrics and goals so that progress and completion can be identified.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Would capture the popular imagination, and thus garner political support.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

What would you propose as a grand challenge for assessment in higher education?

Please rate the challenge you proposed using the four characteristics of grand challenges.

	Not at all	A little	To some extent	Very much
1) Extremely hard to do, yet doable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Not at all	A little	To some extent	Very much
2) Would produce positive outcomes potentially affecting large numbers of people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3) Is associated with clear metrics and goals so that progress and completion can be identified.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4) Would capture the popular imagination, and thus garner political support.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please rank order these challenges from least to most important. If you did not propose a grand challenge please select "least important" for line #11.

	Least important	1	2	3	4	5	6	7	8	9	Most Important
1) Involve students in authentic self-evaluation of their own learning.	<input type="radio"/>										
2) Use assessment findings to increase equity.	<input type="radio"/>										
3) Produce visible and actionable assessment findings that drive innovation.	<input type="radio"/>										
4) Use ePortfolios to capture students' learning over the entire span of their education.	<input type="radio"/>										
5) Examine changes in student learning and institutional effectiveness over time.	<input type="radio"/>										
6) Use assessment findings to direct immediate pedagogical improvements.	<input type="radio"/>										

	Least important	1	2	3	4	5	6	7	8	9	Most Important
7) Use assessment findings to inform budgetary initiatives.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>							
8) Disaggregate data to consider important student characteristics.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>							
9) Leverage technology to analyze massive data sets within and across institutions.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>							
10) Communicate relevant, timely and contextualized information about student learning to stakeholders.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>						
11) The Grand Challenge you proposed above.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>							

How many years have you been employed in higher education?

How many years have you been involved in assessment activities?

Which of the following best describes your current institution:

- Two-Year Institution
- Four-Year Primarily Undergraduate Institution
- Undergraduate and Graduate Institution
- Primarily Graduate Institution
- Other (please explain)

Which of the following best describes your current institution?

- Public
- Private Non-profit
- Private For-profit

Which of the following describes your current position?

- Higher education administration
- Higher education teaching
- Higher education research
- Professional organization serving higher education
- Accrediting organization
- Other (please explain)

Sex

- Female
- Male
- Another

Race and Ethnicity (please select all that apply)

- Alaska Native
- American Indian
- Asian
- Black or African American
- Hispanic or Latino
- Native Hawaiian
- Other Pacific Islander
- White

Age

Thank you for completing our survey!

If you would like to be invited to future conversations about the grand challenges facing assessment practitioners or receive information about the results of this survey, please provide contact information below.

Please be sure to click on "finish" below so your answers will be submitted.