Using Universal Design in Assessments and Assignments to Increase Equity

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http://assessment.uncc.edu/

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Why do we assess learning?

Join by Web

1. Go to **PollEv.com**
2. Enter **KARENSINGERF601**
3. Respond to activity

Join by Text

Write this message

1. Text **KARENSINGERF601** to
   22333 **Text message to this number**
2. Text in your message

Why do we assess learning?

knowledge efficientcy instruction inclusive
improvement confirmation
continuous well two
measure students gaps assess
course. sure awareness teacher
celebrate effectiveness improve
make
reflection student say see outcomes confirm
gauge learning outcome
materials
content because
programs ensure learned
outcomes improvement. learn future

Total Results: 39

Why do we assess learning?

Assessment OF Learning
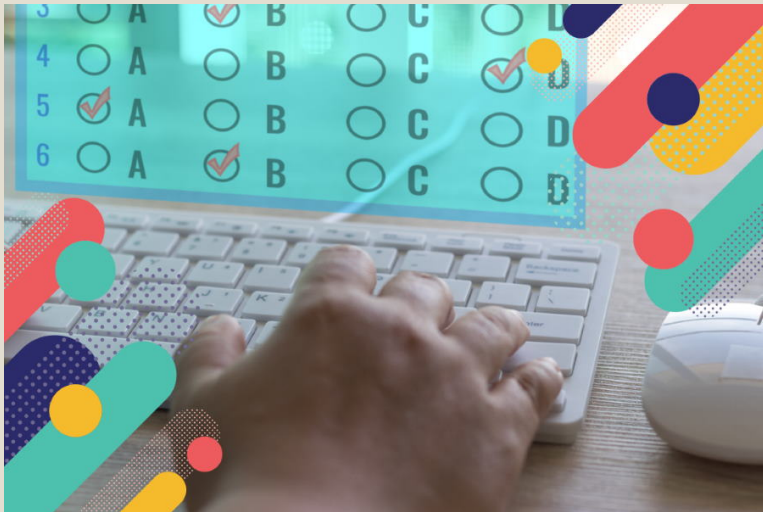
Assessment FOR Learning

Why do students complete assessments?

feedback required requirement grade grades growth learning heard because feel satisfy learning. every class. myself see completed former rating self-reflection assessments progress wanted teacher's told knowledge evaluation competence student compare gauge check

Total Results: 33

Why do students complete assessments?

- Earn a grade

- Learn about the content

- Learn about themselves

- Gain skills

What comes to mind when you think about equity?

field. oppertunity level
authentic individual's uneven
equal opportunity accessibility playing differentiation
currently
needs access fair bias
impartial resources everyone chance same
fairness
providing succeed opportunities
based assessments appropriate
flexibility think

Total Results: 27

Why Equity?

- Social Justice

- Teaching Experiences

- Scholarly Work

Why do you care about creating equitable assessments of learning?

No responses received yet. They will appear here...
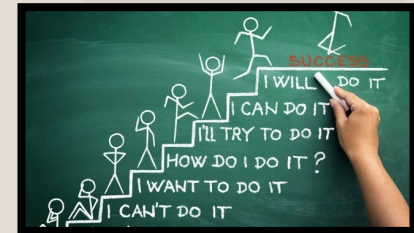
Total Results: 0

Why Equity of Assessments?

Student success and retention

Student academic self-efficacy

Student sense of belonging

Think of the best assignment you ever completed...

- What made it the best?
- What made it memorable?
- What emotions are evoked?
- How has it influenced you?

Think of the best assignment you ever completed... what made it memorable, how did it make you feel, how did it influence you?

connections capable interest shed moment recall history independently
personally choose way) liked company. flex felt newawareness degree. really topic successful
creative light culture questions self-reflection focused high
able scaffolded together. class. confusing final try form course master's learning
pays applicable everything challenging allowed independent amazing. memory
influenced-apply passionate work essay learned students. woven active
application (in evoked-positive aha blew because suddenly exploration mind pull best- good
promoted dive owntopic pride. self-awareness memorable-successful example relevant something.
feedback hard rather capstone current agency good
achievable creativity immediate new flexible

Total Results: 31

Think of the worst assignment you ever completed…

- What made it the worst?
- What made it memorable?
- What emotions are evoked?
- How has it influenced you?

Think of the worst assignment you ever completed… what made it memorable, how did it make you feel, how did it influence you?

mindless frustrated demands 300 form mates bad thinking confusing team embarrassed
arbitrary group irrelevant behaving. poor unimportant transparent consideration purpose
problems. useless 3rd math entire instructions relevant
outside standardized instructor students. assignment work anything day. punitive
feedback acknowledge year never anyone's little
standardized reflective didn't unclear felt boring 9 class pointless punishment horrible critical
applicable livid olds behavior done meaningless consuming
expectations average punished sexist because criteria
content courses impotent avoid grade. directions time upset
obscure take guidance ability

Total Results: 33

Now think about one of your assignments...

How well do each of these statements describe students' likely reactions?

- Results in something I will discuss with others
- Helps me understand myself better
- Improves my understanding of important concepts
- Provides me with experience that will be professionally useful
- Has personal value

Very Much (3), A little (2), Not at all (1)

What do these questions measure?

Utility Value

- Results in something I will discuss with others

Personal Utility Value

- Helps me understand myself better
- Has personal value

Little Miss Helpful
"Just trying to be helpful!"

Academic Utility Value

- Improves my understanding

Professional Utility Value

- Provides me with professionally useful experience

Think about the same assignment…

How well do each of these statements describe students' likely reactions?

- Allows me to express my learning in my own words

- Makes me feel confident I can succeed

- Includes familiar examples and materials

- Measures my true understanding

- Allows me to relate class materials to my experiences

- Includes clear instructions

Very Much (3), A little (2), Not at all (1)

What do these measure?

Inclusive Content is equally accessible to all students

- Express learning in my own words
- Feel confident I can succeed
- Includes familiar materials
- Measures my true understanding
- Relates materials to my experiences
- Includes clear instructions
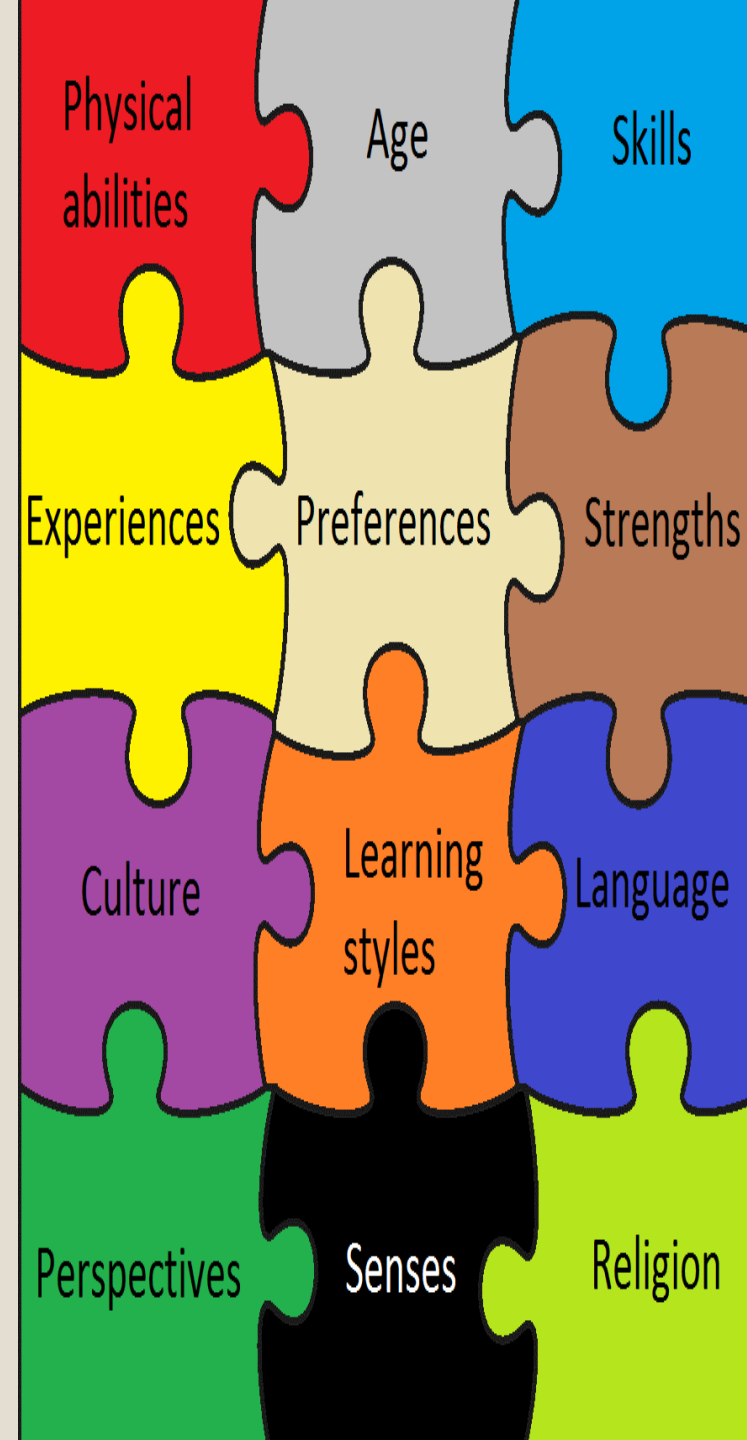
Culturally Relevant Assessment
(Singer-Freeman, Hobbs, & Robinson, 2019)

- High utility value
  - Work has meaning beyond the academic context
- Inclusive content - Limits effects of prior knowledge and privilege
  - Aligned with teaching
  - Accessible materials
  - Clear instructions
  - Scaffolding
  - Inclusive environment

Summary of Research
(Hobbs, Singer-Freeman, & Robinson, 2021)

More Risky

- Tests
  - Low stakes or high stakes
  - Multiple choice
  - Open-book and Online
- "Homework"
- Formal Writing

Less Risky

- Writing
  - Writing in the discipline
  - Reflective writing
  - Inclusive projects
- Oral Reports
- Group Projects
- ePortfolios
- Work for flipped class

Finding a Focus for Improvements

- Consider who in your class lacks privilege
  - Underrepresented ethnic minority students
  - First generation college students
  - Transfer students
  - Students with different abilities
  - Students with limited financial resources

- Consider which assignments might benefit
  - Reflect on previous student performance
  - Talk to students
  - Survey students
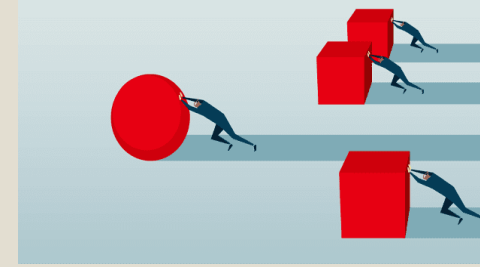
Increase Utility Value – 1ˢᵗ Day

Present your logic model

Skills

Academic
- Writing
- Observation
- Reasoning

Professional
- Progress reports
- Teaching

Personal
- Parenting
- Arguing

Activities

- Internship
- Observational reports
- Class Discussions
- Reflective writing

Outcomes

Academic
- Concise Writing
- Support for positions

Professional
- Childcare positions

Personal
- Parenting
- Relationships

Increase Utility Value – 1st Day

Draft the beginning of your logic model -

Skills

What will students learn in your class that will help them in future classes, future jobs, or in their lives…

Activities

How will each activity and assignment support students' acquisition of these skills?

Outcomes

What new skills will they have if successful in your class?

Increase Utility Value - Assignments

- Explain academic, professional, and personal value

- Provide feedback about improved skills and their value
  - *Your improved ability to separate observations from interpretations will help you in future research classes*

- Create social pedagogy – intense communication around an authentic task
  - Pair and share
  - ePortfolios
  - Blogs
  - Teaching videos

- Create reflective assignments
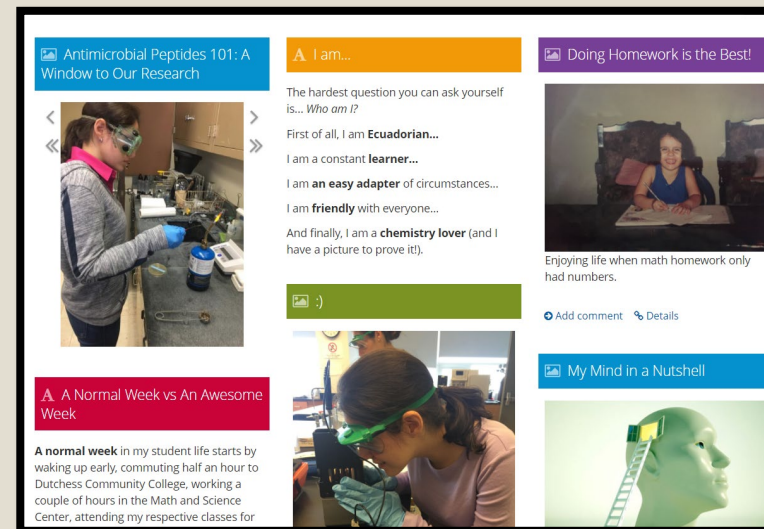
Create Reflective Assignments

1) Evaluate value of learning
- Which information did you find most affirming or helpful?
- What pieces of your work would benefit from more study?
- How is this an example of <u>this learning outcome?</u>

2) Make connections with lived experiences
- What would you want to tell a friend about this work?
- Use concepts to explain something you have seen in the world.
- What values are shared between your family and this discipline?

3) Plan or "envision a future self."
- Describe a way you will change your future work or plans.
- What do you want to be sure to remember?

Increase Utility Value – Last Day

- **Return to logic model**
  - Ask students to reflect on learning and provide suggestions
  - Suggest lines for resume
- **Encourage saving, sharing, and practicing**
  - Curate student work
  - Highlight useful documents
  - Provide tips for practice

Skills	Assignments	Outcomes
Academic • Writing • Observation • Reasoning **Professional** • Progress reports • Teaching **Personal** • Parenting • Arguing	• Observational reports • Reflective writing	**Academic** • Writing • Logic **Professional** • Childcare positions **Personal** • Parenting • Relationships

Increase inclusive content – 1st Day

- Select accessible materials (consider cost and content)
  - Open resources vs. expensive textbooks
  - Free software vs. expensive software (R vs. SPSS)
- Provide clear routes to support
  - Self-assessments
  - Welcoming office hours
- Establish a supportive environment
  - Value questions
  - Consider criterion-based grading
  - Help students form relationships

Increase Inclusive Content – Assignments

- Provide and discuss rubrics
  - Clarifies expectations for students
  - Focuses faculty grading
- Include clear and explicit instructions that align with rubrics
- Limit reliance on material you haven't taught
  - Provide scaffolding with links to just-in-time information
  - Have students record video tutorials
- Provide feedback that is growth oriented and notes improvements

Create Inclusive Assessment Environment

- Encourage questions
  - Use them to improve current and future assignments
  - Share answers to questions with all students
- Create a welcoming environment
  - Reduce stress
  - Reduce factors that highlight privilege
- Use unidentified assignments for grading
- Provide diverse faculty and teaching support staff
- Share your own struggles and the struggles of leaders in your discipline

What about tests?

- Use test blueprints to identify questions with equity gaps
- Have students provide feedback on (or write) questions
- Encourage questions during testing
  - Provide answers to entire class
- Limit test anxiety
  - Open book
  - Untimed
  - Provide all questions in advance
- Increase utility value
  - Explain why memorization, fast response, skills in multiple choice testing is necessary for academic of professional success

Apply to an assignment

- Describe an assignment in chat and propose
  - A way to increase utility value
  - Concerns you have with implementing this tactic

Thinking of the same assignment

- Describe a way to increase inclusive content in this assignment

- Concerns you have with implementing this tactic

Now consider a class you teach…

- Write in the chat
    - Some things you might do to increase the utility value of the class to students
    - Questions or concerns with implementing these tactics

Considering the same class…

- Write in the chat
  - Things you might do to increase the extent to which your class is inclusive
  - Questions or concerns with implementing these tactics

Inclusion

Exclusion   Segregation   Integration
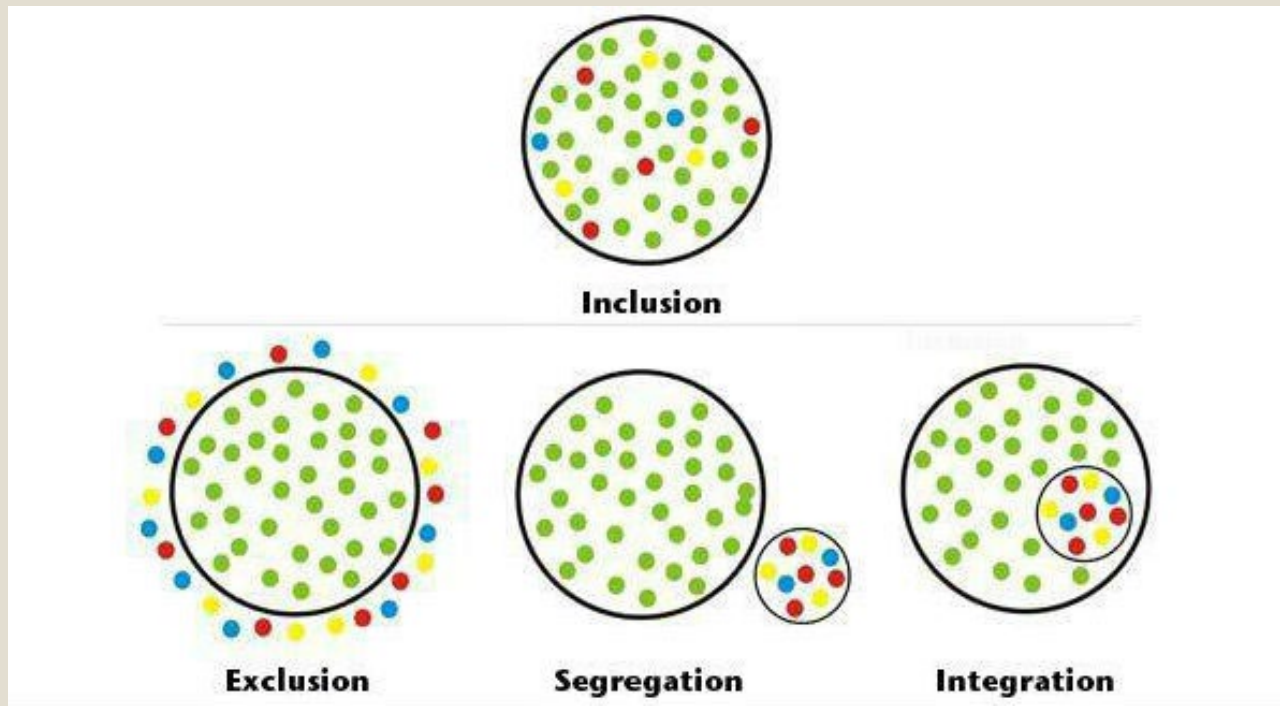
Conclusions

- Increasing equity in assessments benefits all students by creating more accurate assessments

- Equitable assessments require
  - A logical plan
  - Perspective taking
  - Willingness to examine our practices and own our role in student failures

To Learn More

Hobbs, H., Singer-Freeman, K. E., & Robinson, C. (2021). Considering the effects of assignment choices on equity gaps. *Journal of Research and Practice in Assessment, 16(1). link*

Singer-Freeman, K. E. & Bastone, L. (2021). Social sciences general education: Incorporating self-relevant academic writing using ePortfolios. D. Kelly-Riley & E. Norbert (Eds.), *Improving Outcomes: Disciplinary Writing, Local Assessment, and the Aim of Fairness.* Modern Language Association: New York. link

Singer-Freeman, K. E. & Cottenoir, M. (2020). The value of your curriculum map to minimize harm from emergency remote instruction. *Emerging Dialogues. Fall* link

Singer-Freeman, K. E. & Bastone, L. (2019). Supporting persistence and identity development during applied learning experiences. *Journal of Applied Learning in Higher Education, 8,* 59-78 link

Singer-Freeman, K. E. & Bastone, L. (2019). Increasing equity in general education using self-relevant writing. *Intersection: A Journal at the Intersection of Assessment and Learning.* 24-27 *link*

Singer-Freeman, K. E. & Bastone, L. (2019). Developmental science concepts guide effective support of underrepresented STEM students. *Journal of Biochemistry and Molecular Biology Education. 47(5)* 506-512. link

Singer-Freeman, K. E., Hobbs, H., & Robinson, C. (2019). Theoretical matrix of culturally relevant assessment. *Assessment Update, 31(4).* link

Singer-Freeman, K. E. & Bastone, L. (2018). ePortfolio and declarations of academic self: A tale of two contexts. In B. Eynon and L. Gambino (Eds.) *Catalyst in Action: Case Studies of High-Impact ePortfolio Practice.* Virginia: Stylus Publishing, LLC. 84-97.

Singer-Freeman, K. E. & Bastone, L. (2016). *Pedagogical Choices Make Large Classes Feel Small* (NILOA Occasional Paper No. 27). Urbana, IL: University of Illinois and Indiana University, National Institute for Learning Outcomes Assessment. link

Singer-Freeman, K. E., Bastone, L., & Skrivanek, J. (2016). Using ePortfolios to assess applied and collaborative learning, academic identity and future orientation in a summer research program for community college students. *International Journal of ePortfolio, 6(1),* 45-57. link

Singer-Freeman, K.E. (2015). MMR vaccine and autism: Scientific inquiry, ethics, and evidence-based problem solving. *AAC&U Scientific Thinking and Integrative Reasoning Skills Case Study.* link

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6 Online Self-Paced Modules

- IEC101 Introduction to Careers in Institutional Effectiveness (4 weeks)
- IEC102 Student Learning Outcomes (8 weeks)
- IEC103 Strategic Planning and Implementation (6 weeks)
- IEC104 Accreditation (6 weeks)
- IEC105 Building Relationships for Institutional Effectiveness (5 weeks)
- IEC106 Institutional Research (6 weeks)

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- Higher Education Professionals who wish to transition into institutional effectiveness
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- Faculty embarking on new roles in one or more areas of institutional effectiveness

Abstract

This paper examines students' patterns of success in classes with high DFW rates at a research-intensive university. We investigated whether certain assignment types were associated with inequitable grade distributions for underrepresented minority (URM) and transfer students and whether assignment grade patterns were similar to final grade patterns. Across eight classes, 745 students' grades were analyzed from 27 assignments including tests, papers, projects, homework, and oral reports. In every class, URM students received lower final grades than non-URM students, and transfer students received lower final grades than non-transfer students. In five classes, different patterns of equity emerged across different assignment types and different groups of students. These findings support the importance of going beyond the disaggregation of final grades by disaggregating grades on individual assignments, and the need to develop institutional practices that examine the presence of equity gaps in the classroom.
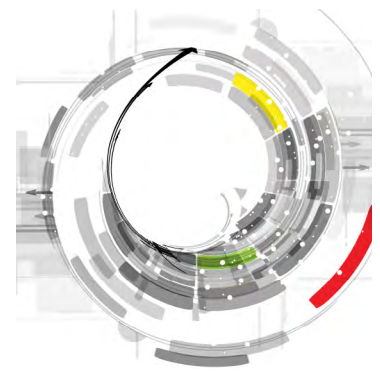
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Considering the Effects of Assignment Choices on Equity Gaps

The Aspen Education and Society Program and the Council of Chief State School Officers (2017) defined equitable institutions as those in which "every student has access to the resources and educational rigor they need at the right moment in their education, despite race, gender, ethnicity, language, disability, family background, or family income" (p. 3). However, as a nation, we are failing to create equitable institutions of higher education. Many colleges and universities still require standardized scores from the SAT or ACT for entry, despite evidence that historically underserved students receive lower scores than other students (College Board, 2018; National Center for Education Statistics, 2019). Lower scores may reduce financial aid awards and discourage students from applying to or being admitted by competitive institutions (Zwick, 2019). Once students gain admission to a college, over a fifth leave without obtaining a credential (Rosenbaum et al., 2015), and over a third of students who matriculate at four-year public universities fail to graduate (Shapiro et al., 2018). A disproportionately high number of students leaving college without degrees are from underrepresented ethnic minority populations (URM) or low-income families. For URM students who transfer between institutions, the completion gaps are larger (Shapiro et al., 2018).

Transferring between institutions creates stress for students and is followed by a period of adaptation called "transfer shock" (Diaz, 1992; Fauria & Fuller, 2015). For

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example, transfer students in Texas were four times less likely to be retained after one year than non-transfer students (Fauria & Slate, 2014). Many transfer students experience a dip in grade point average (GPA) during the first or second semester at a new institution (Jacobson et al., 2017). Low grades can contribute to students' doubts about their ability to succeed. Ishitani (2008) found that transfer students with higher first semester GPAs were more likely to persist than students with lower first semester GPAs.

For many students, the first step toward leaving college can be a low or failing grade in a class.

Students who leave college without credentials have invested substantial amounts of time and money in the pursuit of higher education without any tangible benefit. Rosenbaum et al. (2015) called these students the "new forgotten half." With rapid demographic, economic, and cultural transitions, even more students will transfer between institutions of higher education and be first-generation, low-income, and students of color (McGee, 2015). Consequently, it is essential that institutions of higher education initiate practices to increase completion rates of underserved students (Association of American Colleges and Universities, 2018; Harper & Harris, 2012; Olson, 2020).

For many students, the first step toward leaving college can be a low or failing grade in a class. At our institution, we found that among students experiencing financial distress, every unit increase in GPA increased the odds the student would be retained by a factor of 1.68. Thus, closing gaps in class grades is an important element of closing gaps in college completion. Differences in college GPA are only partially explained by differences in income and prior academic preparation (Fletcher & Tienda, 2010; Lorah & Ndum, 2013). Spenner et al. (2004) found that only 40% of the variance between White and Black students' first semester grades could be explained by differences in socioeconomic background and academic preparation, leaving 60% of the gap unexplained.

Even when low assignment grades do not impact a student's final grade, low assignment grades can negatively impact retention by reducing a student's sense of academic self-efficacy (Montenegro et al., 2020). Academic self-efficacy describes students' beliefs about their ability to execute a course of action to successfully complete an academic task (Bandura, 1997). When students lack a sense of academic self-efficacy, they are less likely to persist to overcome academic challenges (Chemers et al., 2001; Han et al., 2017; Shen et al., 2016). Thus, even in instances in which low assignment grades do not translate directly to low course grades, when low assignment grades reduce students' sense of academic self-efficacy, there could be long-term reductions in academic success.

Because educational equity gaps represent institutional failure, improving equity requires organizational change and faculty engagement (Bensimon, 2005). To engage faculty, institutions must create cultures of inquiry in which the examination of data informs faculty-driven responses to inequities (Bensimon, 2005). Disaggregation of student learning data reveals educational equity gaps and supports the establishment of institutional cultures of inquiry (Maki, 2017). Currently, most colleges and universities only report aggregated student outcomes data, which obscures evidence of privilege-based stratification (Bauman et al., 2005; Singer-Freeman et al., 2021). To date, little research examines equity gaps within assignments. Campuses that disaggregate grades do so based on course grades. When faculty learn of equity gaps in their classes, it can be difficult for them to determine the source of the inequity. An examination of disaggregated data across different assignments in a course can provide faculty with actionable information. Identifying assignments that result in inequitable patterns of performance can lead to evidence-based assignment modifications. Demonstrating that different patterns of equity exist across different assignment types can be the first step toward engaging faculty in disaggregating assignment grades in their classes.

In the current work, we examined disaggregated grades across different assignments in classes with 50 or more enrolled students and with high numbers of D, F, or W (withdrawal) grades at a research-intensive university. This work did not involve direct contact with either students or faculty. Our goal was to determine whether grading distributions differed for URM and transfer students compared to non-URM and non-transfer students across different assignments and final grades within classes. We focused our exploratory work on large classes in which many students received grades of D, F, or W (DFW rates) because success or failure

in these classes has consequences for retention in the major and at the university. Because faculty and administrators are currently examining the role these classes play in student success, evidence of different grading distributions on assignments in these classes will help to establish the importance of disaggregating assignment grades.

Methods

Procedure

We obtained a list of 88 classes enrolling 50 or more students that had DFW rates of 30% or higher during the fall and spring semesters in 2017 and 2018. The courses that were listed included multiple sections taught by different instructors. We reviewed assignments from all sections of each course that recorded grades in the university's learning management system. The review of assignments revealed eight classes that stored grades in the learning management system and included graded assignments other than quizzes, tests, exams, or completion-based grades (such as attendance grades or assignments in which students received full credit for completion). Because we wished to examine patterns of performance across different assignment types, we excluded the 80 classes that did not offer forms of assignments other than quizzes, tests, exams, or completion-based assignments. Of the classes that did not include different forms of assignments, 42 (53%) were introductory-level classes and 57 (71%) were science, technology, engineering, and mathematics (STEM) classes. The eight remaining classes included in analyses were four introductory classes: Pre-Calculus (MATH), Introduction to Communication Theory (COMM), Network Theory II (ENGR), and Principles of Accounting (ACCT) and four advanced classes: Organic Chemistry Lab (CHEM), Design & Implementation – Object-Oriented Systems (INFO), Physiological Psychology (PSYC), and Sociology of Health and Illness (SOCY).

When a class was taught by the same instructor using the same assignments for more than one semester, we included data from all offerings between 2016 and 2018. The classes are listed in Table 1, along with the number of class offerings, percentage of students receiving final grades of D or F (DF rates), and special features of the class. We do not report withdrawal rates because this information was not available in the learning management system. As seen in Table 1, DF rates varied widely between classes ranging from 3% in ENGR to 25% in SOCY. Most of the classes were offered in the College of Liberal Arts. Several classes required completion of prerequisite courses (with a final grade of C or above) prior to enrollment.

Even in instances in which low assignment grades do not translate directly to low course grades, when low assignment grades reduce students' sense of academic self-efficacy, there could be long-term reductions in academic success.

Table 1
Classes Included in the Study

Class	Sections	% DF Rates	College	Special Features
MATH	2	19%	Liberal Arts	Prerequisite for Engineering Calculus
COMM	1	16%	Liberal Arts	——
ENGR	1	3%	Engineering	3 prerequisites required for enrollment
ACCT	1	13%	Business	Flipped Delivery – students viewed lectures online at home and spent class time working on problems
CHEM	9	14%	Liberal Arts	Lab, 1 prerequisite required for enrollment
INFO	1	5%	Computing	——
PSYC	1	11%	Liberal Arts	4 prerequisites required for enrollment, online delivery
SOCY	3	25%	Liberal Arts	1 prerequisite required for enrollment

Every class included at least two different forms of graded assignments. The types of assignments included exams (cumulative finals and mid-terms), tests (covering several weeks of work), quizzes (low-stakes frequent assessments covering a single week or day of work), homework (frequent low stakes work to check for understanding and allow practice), writing (scientific lab reports, formal essays, and reading responses), group projects, in-class activities, and oral reports. The proportion of the final class grade determined by each assignment type is reported in Table 2. Tests were the most common form of assignment, followed by homework and writing. Generally, introductory classes (the first four in the table) relied more heavily on tests and homework than advanced courses which were more likely to include writing assignments, projects, activities, or an oral report.

Table 2
Proportion of Final Class Grade Determined by each Assignment

Class	Exams, Quizzes or Tests	Homework	Writing	Group Project	Class Activity	Oral Report
MATH	80%	20%				
COMM	83%		8%			
ENGR	85%	15%				
ACCT	72%	7%		14%		
CHEM	5%		95%			
INFO	50%	40%			10%	
PSYC	75%					15%
SOCY	30%	20%	30%			

Note. Rows may not total to 100% because completion-based grades were excluded.

Participants

We report the number of participants and demographic information in Table 3. We had a total sample size of 745 students which included 53% female, 47% transfer, 51% White, 23% African American, 14% Hispanic, 8% Asian, 3% two or more races, and .01% Native American. Four percent of the sample did not provide information about their race or ethnicity.

Table 3
Demographic Information

Class	Total	Female	Transfer	White	African American	Hispanic	Asian	2 or more Races	Native American	No report
MATH	109	36	20	56	23	10	13	6	1	1
COMM	146	81	93	79	35	19	3	4	0	6
ENGR	41	2	17	22	4	4	7	1	0	3
ACCT	53	13	31	30	7	11	2	1	0	2
CHEM	150	101	57	74	24	19	24	1	0	9
INFO	61	12	16	30	9	2	15	4	0	1
PSYC	54	43	37	33	15	3	1	1	0	3
SOCY	131	107	81	50	51	13	5	6	0	6
Total	745	395	352	379	169	103	62	24	1	31
%		53%	47%	51%	23%	14%	8%	3%	.01%	4%

Because many classes had limited enrollment of students from certain underserved groups, we compared URM students, which included African American, Hispanic, and Native American students (37% of total sample), to non-URM students which included White and Asian students (59% of total sample). We chose to classify both White and Asian students as non-URM because students from these groups are either well-represented or over-represented at four-year institutions of higher education in the United States when compared to their representation in the population of the United States (Monarrez & Washington, 2020). We excluded participants who did not report race or ethnicity or reported two or more races. We compared students who transferred to the university (transfer students) to students who began their studies at the university (non-transfer students).

Coding

To compare patterns of performance on different assignment types without influence of assignment weighting, we converted scores into percentages and created a single average score for each assignment type for each student. We included scores of 0 for missing assignments in average scores. For example, a single average homework score was created by totaling the number of homework points received and dividing it by the total number of possible homework points. Independent samples t-tests were conducted using SPSS to evaluate differences between URM and non-URM students and differences between transfer and non-transfer students on individual assignments and in final grades. Cohen's *d* was calculated by hand.

Results

Final course grades are reported as a function of URM and transfer status in Tables 4 and 5. An inspection of scores prior to data analysis revealed that in every class, URM students received lower final grades than non-URM students, and transfer students received lower final grades than non-transfer students. To determine if these differences were statistically significant, we calculated independent samples t-tests comparing final grades of URM students to non-URM students and transfer students to non-transfer students. We observed significant differences with moderate effect sizes in SOCY in which URM students received lower average grades (70%) than non-URM students (77%), $t(102) = 2.75$, $p =.01$, $d = .57$ and transfer students received lower average grades (71%) than non-transfer students (76%), $t(129) = 2.29$, $p = .02$, $d = .39$. A significant difference was observed for transfer students in ACCT $t(51) = 2.18$, $p = .04$, $d = .54$ such that transfer students received lower average grades (74%) than non-transfer students (79%).

Demonstrating that different patterns of equity exist across different assignment types can be the first step toward engaging faculty in disaggregating assignment grades in their classes.

Table 4
Non-URM and URM Student Final Grades Reported as Percentages with Corresponding t-Tests

Class	Non-URM	URM	t-test	*p*	Cohen's *d*
MATH	76% (17)	75% (14)	$t(99) = .28$	.78	.06
COMM	72% (11)	70% (12)	$t(134) = .91$	.37	.17
ENGR	55% (16)	54% (5)	$t(40) = .17$	.87	.08
ACCT	77% (9)	75% (9)	$t(48) = .74$	.46	.22
CHEM	81% (18)	76% (20)	$t(139) = 1.37$	.18	.26
INFO	90% (12)	84% (12)	$t(58) = 1.66$	.10	.50
PSYC	82% (16)	81% (14)	$t(49) = .32$	.75	.07
SOCY	77% (9)	70% (15)	$t(102) = 2.75$	.01	.57

Note. Standard deviations are reported in parentheses.

Table 5
Non-Transfer and Transfer Student Final Grades Reported as Percentages with Corresponding t-Tests

Class	Non-Transfer	Transfer	t-test	p	Cohen's d
MATH	76% (17)	75% (6)	$t(105) = .14$	.78	.06
COMM	73% (13)	69% (15)	$t(144) = 1.72$	.09	.29
ENGR	57% (14)	54% (15)	$t(43) = .66$	.51	.21
ACCT	79% (7)	74% (11)	$t(51) = 2.18$	.04	.54
CHEM	81% (17)	78% (17)	$t(137) = .94$	.35	.18
INFO	89% (13)	87% (10)	$t(59) = .65$	.52	.17
PSYC	82% (19)	80% (15)	$t(53) = .52$	.60	.12
SOCY	76% (13)	71% (13)	$t(129) = 2.29$	.02	.39

Note. Standard deviations are reported in parentheses.

Table 6
Non-URM and URM Student Quiz, Test, and Exam Grades Reported as Percentages with Corresponding t-Tests

Class	Test Type	Non-URM	URM	t-test	p	Cohen's d
MATH	FR Test	78% (15)	78% (12)	$t(99)=.12$	.81	0
	FR Exam	72% (21)	70% (21)	$t(99) =.44$	.78	.10
ACCT	MC Quiz*	83% (13)	81% (22)	$t(48) =.25$	.80	.11
	MC Exam	74% (10)	69% (14)	$t(48)=1.31$	.20	.41
COMM	MC Exam	73% (15)	71% (15)	$t(134)=.65$	.52	.13
ENGR	MC Quiz	67% (21)	62% (17)	$t(40)= .61$	.54	.26
	FR Test	53% (13)	53% (6)	$t(40)=.004$	.99	0
	FR Exam	72% (15)	65% (10)	$t(40)=1.28$	.21	.55
CHEM	MC Quiz*	78% (23)	70% (31)	$t(139)= 1.62$	.10	.29
INFO	MC Exam*	91% (9)	90% (7)	$t(58) =.39$	.70	.12
PSYC	MC Quiz*	87% (8)	83% (8)	$t(49)=1.59$	.12	.50
	MC Exam*	80% (11)	79% (12)	$t(49)= .53$	.60	.09
SOCY	MC Exam*	77% (12)	71% (11)	$t(116)= 2.71$	.01	.52

Note. Online assessments are marked with an asterisk. Standard deviations are reported in parentheses.

To investigate the extent to which different assignment types resulted in different grading distributions, we conducted independent samples *t*-tests comparing assignment grades of URM students to non-URM students and transfer students to non-transfer students. Every class included quizzes, tests, or exams. Quizzes included frequent low-stakes assessments

that covered a small amount of material, tests included non-cumulative assessments that were given to cover several weeks of material, and exams included cumulative mid-terms or finals. Each assessment included either multiple-choice question formats (MC) or free response question formats (FR). As seen in Tables 6 and 7, across the eight classes, three had significant grade differences, with moderate to large effect sizes. In SOCY, non-URM students received higher online multiple-choice exam grades (77%) than URM students (71%), $t(116) = 2.71$, $p = .01$, $d = .52$ and non-transfer students received higher online multiple-choice exam grades (77%) than transfer students (71%), $t(128) = 2.50$, $p = .01$, $d = .50$. In ACCT, non-transfer students received higher multiple-choice exam grades (77%) than transfer students (69%), $t(51) = 2.62$, $p = .01$, $d = .72$. In PSYC non-transfer students received higher online multiple-choice exam grades (84%) than transfer students (77%), $t(53) = 2.02$, $p = .05$, $d = .63$ and non-transfer students received higher online multiple-choice quiz grades (88%) than transfer students (84%), $t(52) = 2.58$, $p = .05$, $d = .53$

Table 7
Non-Transfer and Transfer Student Quiz, Test, and Exam Grades Reported as Percentages with Corresponding t-Tests

Class	Test Type	Non-transfer	Transfer	t-test	p	Cohen's d
MATH	FR Test	78% (15)	76% (15)	$t(105)=.51$	.78	.13
	FR Exam	72% (21)	72% (20)	$t(105)=.03$	.78	0
ACCT	MC Quiz*	87% (11)	78% (22)	$t(47)=1.90$	.06	.82
	MC Exam	77% (9)	69% (13)	$t(51) = 2.62$	.01	.72
COMM	MC Exam	73% (15)	71% (15)	$t(144) =.57$	.57	.13
ENGR	MC Quiz	70% (18)	63% (23)	$t(43) = 1.23$	.23	.34
	FR Test	53% (13)	53% (8)	$t(42) =.14$	.89	0
	FR Exam	72% (15)	71% (12)	$t(41) =.16$	.87	.07
CHEM	MC Quiz*	77% (27)	74% (24)	$t(137) =.63$	.53	.12
INFO	MC Exam*	91% (9)	89% (6)	$t(59) =.75$	.46	.26
PSYC	MC Quiz*	88% (7)	84% (8)	$t(52) = 2.58$	.05	.53
	MC Exam*	84% (10)	77% (12)	$t(53) = 2.02$	.05	.63
SOCY	MC Exam*	77% (11)	71% (13)	$t(128) = 2.50$	.01	.50

Note. Online assessments are marked with an asterisk. Standard deviations are reported in parentheses.

Five classes included homework assignments. Average homework grades are reported as a function of URM and Transfer status in Tables 8 and 9. Significant differences with moderate effect sizes were observed in SOCY in which non-URM students received higher homework (reading response) grades (78%) than URM students (72%), $t(103) = 2.24$, $p = .03$, $d = .37$ and non-transfer students received higher homework (reading response) grades (80%) than transfer students (72%), $t(129) = 2.87$, $p = .01$, $d = .52$.

Three classes included writing assignments. Average writing grades are reported as a function of URM and Transfer status in Tables 10 and 11. Significant differences with moderate to large effect sizes were observed. In COMM non-URM students received higher in-class writing grades (88%) than URM students (80%), $t(134) = 2.79$, $p = .01$, $d =.43$. In SOCY

Table 8

Non-URM and URM Student Homework Grades Reported as Percentages with Corresponding t-Tests

Class	Assignment	Non-URM	URM	t-test	p	Cohen's d
MATH	Problem Sets	77% (23)	76% (23)	$t(99)=.18$	.78	.04
ACCT	Problem Sets	71% (22)	69% (27)	$t(48)=.21$	.84	.20
ENGR	Problem Sets	70% (21)	60% (17)	$t(40)=1.24$	.22	.52
INFO	Programming	91% (16)	81% (23)	$t(58) = 1.87$	.07	.51
SOCY	Reading Responses	78% (11)	72% (20)	$t(103) = 2.24$	.03	.37

Note. Standard deviations are reported in parentheses.

Table 9

Non-Transfer and Transfer Student Homework Grades Reported as Percentages with Corresponding t-Tests

Class	Assignment	Non-Transfer	Transfer	t-test	p	Cohen's d
MATH	Problem Sets	76% (24)	76% (21)	$t(105)=.04$	.78	0
ACCT	Problem Sets	74% (16)	67% (30)	$t(51)=1.11$	.27	.29
ENGR	Problem Sets	69% (18)	67% (24)	$t(43) = .40$	.69	.09
INFO	Programming	90% (20)	86% (15)	$t(59) =.59$	.56	.23
SOCY	Reading Responses	80% (15)	72% (16)	$t(129) = 2.87$	.01	.52

Note. Standard deviations are reported in parentheses.

Table 10

Non-URM and URM Student Writing Grades Reported as Percentages with Corresponding t-Tests

Non-URM and URM Student Writing Grades in Percentages with Corresponding t-Tests

Class	Assignment	Non-URM	URM	t-test	p	Cohen's d
COMM	In Class	88% (13)	80% (23)	$t(134) = 2.79$	.01	.43
CHEM	Lab Report	80% (19)	75% (21)	$t(139)=1.35$	.18	.25
SOCY	Essay	82% (7)	78% (13)	$t(93) = 2.07$	.04	.38

Note. Standard deviations are reported in parentheses.

non-URM students received higher essay grades (82%) than URM students (78%), $t(93) = 2.07$, $p = .04$, $d = .38$, and non-transfer students received higher essay grades (84%) than transfer students (77%), $t(125) = 3.95$, $p = .00$, $d = .74$.

Three classes included other forms of assignments: a group project, in-class activities, and an oral report. Average assignment grades are reported as a function of URM and Transfer status in Tables 12 and 13. A significant difference with a moderate effect size was observed in INFO in which non-URM students received higher in-class activity grades (83%) than URM students (70%), $t(58) = 2.16$, $p = .04$, $d = .60$.

Table 11
Non-URM and URM Student Writing Grades Reported as Percentages with Corresponding t-Tests

Class	Assignment	Non-transfer	Transfer	t-test	p	Cohen's d
COMM	In Class	85% (15)	85% (16)	$t(144)=.22$	.82	0
CHEM	Lab Report	80% (18)	77% (18)	$t(137)=1.03$	.31	.17
SOCY	Essay	84% (6)	77% (12)	$t(125) = 3.95$	.00	.74

Note. Standard deviations are reported in parentheses.

Table 12
Non-URM and URM Assignment Grades Reported as Percentages with Corresponding t-Tests

Class	Assignment	Non-URM	URM	t-test	p	Cohen's d
ACCT	Group Project	86% (9)	91% (9)	$t(48) = 1.90$	.06	.56
INFO	Class Activities	83% (20)	70% (23)	$t(58) = 2.16$	.04	.60
PSYC	Oral Report	97% (12)	94% (11)	$t(49) = .73$	.47	.26

Note. Standard deviations are reported in parentheses.

Table 13
Non-transfer and Transfer Student Assignment Grades Reported as Percentages with Corresponding t-Tests

Class	Assignment	Non-transfer	Transfer	t-test	p	Cohen's d
ACCT	Group Project	86% (12)	89% (8)	$t(51)=1.05$	.30	.29
INFO	Class Activities	81% (23)	80% (15)	$t(59) =.12$	.90	.05
PSYC	Oral Report	93% (16)	96% (10)	$t(53) =.82$	.93	.23

Note. Standard deviations are reported in parentheses.

Discussion

We began this work with the goal of demonstrating the importance of disaggregating assignment and final grades as a first step towards identifying patterns of performance in different student populations. We investigated whether certain assignments were associated with grade distributions in which URM or transfer students received lower grades than non-URM or non-transfer students. Both URM students and transfer students have been shown to be underserved by institutions of higher education (Bensimon, 2005; Nuñez & Yoshimi, 2017). We hypothesized that differing grade distributions in which students from underserved groups receive lower grades than those from other groups are evidence of educational equity gaps. Further, we hypothesized that examining assignments with uneven distributions of grades will engage faculty in a culture of equity in which changes to assignment design might be a route to improving equity in educational attainment.

We found a great deal of variability in the patterns of performance that emerged from final grades and individual assignment grades. In four of the eight classes, different patterns of performance emerged across individual assignments and final grades. These results support the importance of considering patterns of performance on assignments to clarify and address educational equity gaps. In every class, we found URM students received lower final grades than non-URM students and transfer students received lower final grades than non-transfer students. There were several instances in which these differences had moderate effect sizes despite not reaching conventional levels of significance. Strikingly, of the 27 assignments analyzed across eight classes, non-URM students received higher average grades than URM students in 23 assignments (85%), and non-transfer students received higher average grades than transfer students in 21 assignments (78%). For both URM and transfer students, significant differences were observed in six assignments (22%).

> **Structuring assignments so that content is equally familiar to all students reduces educational equity gaps by limiting the effects of prior knowledge and privilege.**

Given the prevalence of assignment grade distributions that favored students from well-served groups over students from underserved groups, it is likely that small, non-significant, grade differences across several assignments did contribute to significant differences in final grades. Accordingly, we believe that even non-significant grade differences should be considered by faculty who are interested in improving equity in their classes. Additionally, we posit that inequitable patterns of assignment grades matter even in instances in which these grades do not contribute to low final grades. Low assignment grades matter because assignment grades provide students with information about how they are viewed by faculty in a discipline (Singer-Freeman & Bastone, 2019b). Low grades communicate a lack of success, which may become part of the student's academic sense of self, reducing feelings of academic self-efficacy and the student's sense of belonging. A diminishment in any of these areas can reduce persistence within a major or within an institution (Chemers et al., 2001; Han et al., 2017; Shen et al., 2016; Singer-Freeman & Bastone, 2019a, 2019b; Singer-Freeman et al., 2019).

There are several methods for creating equitable assessments. One is to accept that the transmission of knowledge is not a neutral activity (Montenegro & Jankowski, 2020) and consider positionality and agency at each phase of the assessment cycle (Heiser et al., 2017). Life experiences, privilege, and biases can influence the types of questions that are asked, what is viewed as a correct response, and the types of assessment methodologies that are selected. Each of these factors can contribute to educational equity gaps (Cumming & Dickson, 2007; Stowell, 2004). Montenegro and Jankowski (2017; 2020) suggest that when instructors dictate how students will demonstrate learning, it privileges certain types of learning over others. They encourage adopting differentiated assignments to allow students to select assignment structures that best demonstrate their mastery. Although providing students with a choice of assignments may be an effective way to increase equity, it can be impractical and make uniform grading difficult (Singer-Freeman et al., 2019, 2021).

Other approaches to increasing equity in assignments have examined ways specific forms of assessment might misrepresent the abilities of certain student groups (Sleeter, 2004) or be culturally inappropriate to underserved students (Cahill et al., 2004). We and others have begun to explore whether specific features of assignments might increase or reduce equity gaps (Harackiewicz et al., 2015; Singer-Freeman & Bastone, 2018, 2019a, 2019b, 2021;

Singer-Freeman et al., 2019, 2021; Steele & Aronson, 1995; Stiggins & Chappuis, 2005). In our work, we found that assignments often vary along two dimensions: utility value and inclusive content (Singer-Freeman et al., 2019). Utility value describes the extent to which students perceive work to have value (Eccles et al., 1983). Assignments can be professionally, academically, or personally useful. Experimental and applied work have established that increasing the utility value of assignments reduces educational equity gaps (Harackiewicz et al., 2015; Singer-Freeman & Bastone, 2019a, 2021; Singer-Freeman et al., 2019; 2021). Inclusive content describes material that is equally accessible to all students (Gay, 2010). If examples are drawn from the dominant culture, they are less accessible to students from other cultures. Structuring assignments so that content is equally familiar to all students reduces educational equity gaps by limiting the effects of prior knowledge and privilege. Providing clear and detailed instructions and grading rubrics makes content more inclusive by eliminating the benefits of prior preparation from other classes (Gay, 2010; Singer-Freeman et al., 2019, 2021). We hypothesize that increasing assignments' perceived utility value and inclusive content has the potential and power to mitigate equity gaps.

Improving equity requires faculty engagement in a culture of inquiry in which the examination of data informs responses to inequities (Bensimon, 2005; Maki, 2017). We believe the data presented in this paper are an example of the kinds of data that can be shared with faculty and students as a starting place for conversations about increasing equity in classes. As faculty review patterns of equity and inequity at the assignment level and discuss their assignments with students, they will be able to make informed changes to assignments that will increase equity. In some instances, assignments that evoke equity gaps may examine similar competencies as alternative assignments that do not evoke inequity. In these cases, faculty might consider replacing assignments that result in equity gaps with more equitable methods of assessment. In other instances, assignments that result in equity gaps may be revealing incomplete mastery of an essential learning outcome. In these cases, it might be important to consider whether all students have equal access to educational resources and prior learning. For example, if transfer students are struggling to demonstrate mastery in an area, it might be worth considering whether the course is assuming levels of prior preparation that transfer students may lack.

Limitations and Future Directions

There were some limitations of the current work. Because this work was exploratory, we did not discuss the assignments with either students or faculty. Having relied on class syllabi and materials available in the learning management system to classify assessments, we cannot know the extent to which students viewed the assignments as being high in inclusive content or utility value and how those perceptions might have impacted student performance. Having established the importance of disaggregating assignment grades in this work, we are currently working directly with students to examine whether their views of assessments predict equity gaps. Because we did not partner with faculty, we cannot establish if the assessments with equity gaps were evaluating the same learning as assessments without equity gaps.

Finally, we did not evaluate the long-term effects of equity gaps on students. There is evidence of completion gaps in higher education (Shapiro et al., 2018). In future work, it will be important to examine how academic self-efficacy, identity, and sense of belonging are impacted by low assignment grades and whether low course and assignment grades increase the likelihood students will leave a major or fail to complete a degree.

Conclusion

The current work found frequent equity gaps for both URM and transfer students. Importantly, equity gaps appeared to be more common in multiple-choice tests and formal writing than in other assignment types. Because patterns of equity gaps differed between final course grades and individual assignment grades, faculty should consider disaggregating grades on individual assignments. Because patterns of equity gaps varied within assignment types, future research should investigate whether specific features of assignments such as utility value and inclusive content influence the size of equity gaps. We believe that assessment professionals play a critical role in this work. Encouraging the disaggregation of student

As faculty review patterns of equity and inequity at the assignment level and discuss their assignments with students, they will be able to make informed changes to assignments that will increase equity.

outcomes data can be the first step toward establishing a culture of inquiry in which faculty, students, and assessment professionals explore how assignments are contributing to inequities in higher education. These considerations can direct learning improvements that are sensitive to the needs of every student rather than the needs of the average student.

References

Association of American Colleges and Universities. (2018). A Vision for Equity, results from AAC&U'S project committing to equity and inclusive excellence: Campus-based strategies for student success. https://www.aacu.org/committing-to-equity/publications

Bandura, A. (1997). *Self-efficacy*: *The exercise of control*. W. H. Freeman.

Bauman, G.L., Bustillos, L. T., Bensimon, E. M., Brown, M. C., & Bartee, R. D. (2005). Achieving equitable educational outcomes with all students: The institution's roles and responsibilities. https://www.aacu.org/sites/default/files/files/mei/bauman_et_al.pdf

Bensimon, E. M. (2005). Closing the achievement gap in higher education: An organizational learning perspective. *New Directions in Higher Education*, *131*, 99-111. https://doi.org/10.1002/he.190

Cahill, M., Philpott, D., Nesbit, W., & Jeffery, G. (2004). Educational assessments of first nations students: A Review of the Literature. In W. Nesbit (ed.), *Cultural Diversity and Education*: *Interface Issues*. Memorial University, 77–102

Chemers, M., Hu, L., & Garcia, B. (2001). Academic self-efficacy and first year college student performance and adjustment. *Journal of Educational Psychology*, *93*(1), 55–64. https://doi.org/10.1037//0022-0663.93.1.55

College Board. (2018). More than 2 million students in the class of 2018 took the SAT, highest ever. https://www.collegeboard.org/releases/2018/more-than-2-million-students-in-class-of-2018-took-sat-highest-ever#:~:text=More%20Than%202%20Million%20Students,Highest%20Ever%20%7C%20The%20College%20Board

Cumming, J.J., & Dickson, E.A. (2007). Equity in assessment: Discrimination and disability issues from an Australian legal perspective. *Education and the Law*, *19*, 201-220. https://doi:10.1080/09539960701762854

Diaz, P. (1992). Effects of transfer on academic performance of community college students at the four-year institution. *Community Junior College Quarterly of Research and Practice*, *16*(3), 279-291. https://doi.org/10.1080/0361697920160307

Eccles J. S., Adler, T. F., Futterman, R., Goff, S. B., Kaczala, C. M., Meece, J. L., & Midgley, C. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Ed.), *Achievement and Achievement Motivation* (pp. 75–146). W. H. Freeman.

Fauria, R. M. & Fuller, M. B. (2015). Transfer student success: Educationally purposeful activities predictive of undergraduate GPA. *Research and Practice in Assessment*, *10*, 39-52. https://files.eric.ed.gov/fulltext/EJ1064764.pdf

Fauria, R. M., & Slate, J. R. (2014). Persistence rate differences of university students by race: A within groups comparison. *International Journal of University Teaching and Faculty Development*, *4*(1), 1-10. https://uncc.primo.exlibrisgroup.com/permalink/01UNCC_INST/ 1rqb8fi/cdi_proquest_journ als_1626178943

Fletcher, J. M. & Tienda, M. (2010). Race and ethnic differences in college achievement: Does high school attended matter? *The Annals of the American Academy of Political and Social Science*, *627*(1), 144-166. https://doi.org/10.1177/0002716209348749

Gay, G. (2010). *Culturally Responsive Teaching*: *Theory*, *Research and Practice*. Teachers College Press.

Han, C., Farruggia, S.P., & Moss, T.P. (2017). Effects of academic mindsets on college students' achievement and retention. *Journal of College Student Development 58*(8), 1119-1134. https://doi.org/10.1353/csd.2017.0089

Harackiewicz, J. M., Canning, E. A., Tibbetts, Y., Priniski, S. J., & Hyde, J. S. (2015). Closing achievement gaps with a utility-value intervention: Disentangling race and social class. *Journal of personality and social psychology*, *111*(5), 745-765. https://doi.org/10.1037/pspp0000075

Harper, S. R., & Harris, F, I. (2012). Men of color: A role for policymakers in improving the status of black male students in U.S. higher education. *Institute for Higher Education Policy*, 18.

Heiser, C.A., Prince, K., & Levy, J.D. (2017). Examining critical theory as a framework to advance equity through student affairs assessment. *The Journal of Student Affairs Inquiry*, *3*(1). https://jsai.scholasticahq.com/article/1621-examining-critical-theory-as-a-framework-to-advance-equity-through-student-affairs-assessment

Ishitani, T. T. (2008). How do transfers survive after 'transfer shock'? A longitudinal study of transfer student departure at a four-year institution, *Research in Higher Education*, *49*(5), 403-419. https://doi.org/10.1007/s11162-008-9091-x

Jacobson, T., Delano, J., Krzykowski, L., Garafola, L., Nyman, M., & Barker-Flynn, H. (2017). Transfer student analysis and retention: a collaborative endeavor. *Reference Services Review*, *45*(3), 421–439. https://doi.org/10.1108/RSR-10-2016-0069

Lorah, J. & Ndum, E. (2013). Trends in achievement gaps in first-year college courses for racial/ethnic, income, and gender subgroups: A 12-year studwy. ACT. https://files.eric.ed.gov/fulltext/ED546852.pdf

Maki, P. (2017). *Real-time student assessment: meeting the imperative for improved time to degree, closing the opportunity gap, and assuring student competencies for 21st century needs*. Stylus Publishing.

McGee, J. (2015). *Breakpoint: The changing marketplace for higher education*. Johns Hopkins University Press.

Monarrez, T. & Washington, K. (2020). Racial and ethnic representation in postsecondary education. Urban Institute. https://www.urban.org/research/publication/racial-and-ethnic-representation-postsecondary-education/view/full_report

Montenegro, E., & Jankowski, N. A. (2017). *Equity and assessment: Moving towards culturally responsive assessment* (Occasional Paper No. 29). Urbana: University of Illinois and Indiana University, NILOA.

Montenegro, E., & Jankowski, N. A. (2020). *A new decade for assessment: Embedding equity into assessment praxis* (Occasional Paper No. 42). Urbana, IL: University of Illinois and Indiana University, NILOA.

National Center for Education Statistics. (2019). *Digest of Education Statistics*, 2018. https://nces.ed.gov/fastfacts/display.asp?id=171

Nuñez, A. M., & Yoshimi, J. A. (2017). Phenomenology of transfer: Students' experiences at a receiving institution. *Innovative Higher Education 42*, 173–187 https://doi.org/10.1007/s10755-016-9374-7

Olson, A. (2020). *Equity audits should be commonplace*. Inside Higher Education. https://www.insidehighered.com/views/2020/03/25/more-colleges-should-use-equity-audits-address-inequalities-their-institutions.

Rosenbaum, J., Ahearn, C. & Becker, K. (2015). *The new forgotten half and research directions to support them*. William T. Grant Foundation. https://wtgrantfoundation.org/library/uploads/2015/09/The-New-Forgotten-Half-and-Research-Directions-to-Support-Them.pdf

Shapiro, D., Dundar, A., Huie, F., Wakhungu, P.K., Bhimdiwala, A. & Wilson, S. E. (2018). Completing college: A national view of student completion rates – Fall 2012 Cohort (Signature Report No. 16). Herndon, VA: National Student Clearinghouse Research Center. https://nscresearchcenter.org/signaturereport16/

Shen, C., Miele, D. B., & Vasilyeva, M. (2016). The relation between college students' academic mindsets and their persistence during math problem solving. *Psychology in Russia: State of the Art*, *9*(3), 38–56. https://doi.org/10.11621/pir.2016.0303

Singer-Freeman, K. E., & Bastone, L. (2018). ePortfolio and declarations of academic self: A tale of two contexts. In Eynon and Gambino (Eds.), *Catalyst in Action: Case Studies of High-Impact ePortfolio Practice*. Stylus Publishing, LLC.

Singer-Freeman, K. E., & Bastone, L. (2019a). Increasing equity in general education using self-relevant writing. *Intersections: A Journal at the Intersection of Assessment and Learning*. 24-27. https://www.aalhe.org/assets/docs/Intersection/AAHLE_fall_2019_Intersection_final.pdf

Singer-Freeman, K. E. & Bastone, L. (2019b) Developmental science concepts guide effective support of underrepresented STEM students. *Journal of Biochemistry and Molecular Biology Education*. *47*(5) 506-512. https://doi.org/10.1002/bmb.21292

Singer-Freeman, K. E. & Bastone, L. (2021). Social sciences general education: Incorporating self-relevant academic writing using ePortfolios. In D. Kelly-Riley & E. Norbert (Eds.), *Improving Outcomes*: *Disciplinary Writing*, *Local Assessment*, *and the Aim of Fairness*. Modern Language Association: New York.

Singer-Freeman, K. E., Hobbs, H., & Robinson, C. (2019). Theoretical matrix of culturally relevant assessment. *Assessment Update*, *31*(4). https://doi.org/10.1002/au.30176

Singer-Freeman, K. E., Robinson, C., & Bastone, L. (2021). Balancing the freedom to teach with the freedom to learn: The critical role for assessment and accreditation. In P. Blessinger and E. Sengupta (Eds.). *Innovations in Higher Education Teaching and Learning*: *Academic Freedom in Teaching and Learning Practices*. Emerald Group Publishing. 39-51. https://doi.org/10.1108/S2055-364120200000034005

Sleeter, C. (2004) Critical multicultural curriculum and the standards movement. *English Teaching*: *Practice and Critique*, *3*(2), 122–138. http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.539.4348&rep=rep1&type=pdf

Spenner, K., Buchmann, C., & Landerman, L. (2004). The Black-White achievement gap in the first college year: Evidence from a new longitudinal case study. *Research in Social Stratification and Mobility*, *22*, 187-216. https://doi.org/10.1016/S0276-5624(04)22007-8

Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of Personality and Social Psychology*, *69*(5), 797-811. https://doi.org/10.1037/0022-3514.69.5.797

Stiggins, R. & Chappuis, J. (2005). Using student-involved classroom assessment to close achievement gaps. *Theory into Practice*, *44*(1), 11-18. https://doi.org/10.1207/s15430421tip4401_3

Stowell, M. (2004). Equity, justice and standards: Assessment decision making in higher education. *Assessment & Evaluation in Higher Education*, *29*(4), 495-510. https://doi.org/10.1080/02602930310001689055

The Aspen Education & Society Program and the Council of Chief State School Officers. (2017). Leading for equity: Opportunities for state education chiefs. https://ccsso.org/sites/default/files/2018-01/Leading%20for%20Equity_011618.pdf

Zwick, R. (2019). Assessment in American higher education: The role of admissions tests. *The ANNALS of the American Academy of Political and Social Science*, *683*(1), 130-148. https://doi.org/10.1177/0002716219843469

Theoretical Matrix of Culturally Relevant Assessment

Karen Singer-Freeman, Harriet Hobbs, and Christine Robinson

A GOAL IN HIGHER EDUCATION IS THAT EVERY STUDENT HAS AN EQUAL opportunity to succeed regardless of ethnicity, gender, socioeconomic status, disability, or family educational history. To achieve educational equity, we must examine the equity of assessments. Culturally inclusive assessments decrease the marginalization of students from historically underrepresented groups (Montenegro and Jankowski 2017). Providing students with differentiated ways to demonstrate competence is one route to increase equity (Montenegro and Jankowski 2017). However, it is not always practical to provide differentiated assessment. Therefore, we must examine ways in which specific features of assignments might produce false evidence of achievement gaps (differences in grades reflecting differences in performance and not competence). We analyze features of assessment methods and present a theoretical matrix of culturally relevant assessment.

Inclusive Assignment Features

- *Alignment.* Poor alignment between assessments and competencies can reveal false achievement gaps if differences in grades reflect differences in prior preparation or confidence rather than current mastery. In response to a poorly aligned assignment, academically confident students may be more likely than less confident students to seek out clarification. Multiple-choice test questions, which frequently have complicated sentence structure and vocabulary, are frequently poorly aligned with content (Singer-Freeman and Bastone 2016). Students who understand the content being assessed may answer multiple-choice questions incorrectly because they misunderstand the language or lack sufficient time to read all of the questions and response choices. When students are forced to select a single correct answer from an array of choices, there is no opportunity for elaboration during which learning can be demonstrated. In contrast, open-ended test questions, projects, homework, and writing assignments are frequently better aligned with teaching and student learning outcomes (Gay 2010).

- *Clarity.* When instructions are unclear, students with strong academic preparation can use previous experiences to infer the correct approach, while those with less experience may approach the task incorrectly. Additionally, students from privileged groups may feel more comfortable asking for clarification than students from histor-

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ically underrepresented groups. The use of well-constructed rubrics increases both assignment clarity and grading equity (Montenegro and Jankowski 2017). Rubrics focus evaluators' attention on specific concepts and reduce bias that may occur when evaluators assess nonessential elements of student work.

- *Scaffolding.* Later assignments should build on competencies that are practiced in early assignments (Gay 2010). Early assignments should include detailed rubrics, prompts, and instructions that support student success. When similar rubrics are used across assignments, it allows students to improve their ability to self-assess and scaffolds a higher level of performance. Scaffolded assignments minimize effects of differential preparation. The successful completion of early, relatively simple, assignments builds trust and prepares students to persist when assignments become more difficult (Ladson-Billings 1995).
- *Assessment environment.* Tests that are given in a group setting with time constraints can evoke stereotype threat (Steele and Aronson 1995). Stereotype threat describes the feelings individuals have when they believe they are at risk of confirming negative stereotypes about their group. When the assessment environment evokes stereotype

> *Alignment, clarity, and scaffolding should be present in all assignment types, and it is always essential to create an inclusive assessment environment.*

threat, this can affect students' ability to demonstrate competence. Any situation that highlights race, ethnicity, gender, or privilege can evoke stereotype threat. This includes writing demographic information at the top of a test but can also include being tested as a part of a group in which the student is a visible minority. In general, assignments such as papers and projects that students complete independently and that do not reveal group membership are less likely to evoke stereotype threat than tests that are completed as part of a group.

- *Inclusive content.* When students demonstrate learning by applying content to an example, it is critical that the example be equally familiar to all students (Ladson-Billings 1995). The presence of unfamiliar content interferes with students' ability to demonstrate competence by creating confusion or feelings of exclusion.

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Theoretical Matrix of Culturally Relevant Assessment

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Providing students with opportunities to relate course content to their lives can be an effective way to ensure that assignment content is inclusive (Singer-Freeman and Bastone 2018). Assignments in which students select ways of demonstrating knowledge such as the use of genres or the analysis of materials from different cultural or social groups are also high in inclusive content because they allow students to select material or styles that are congruent with their experience. In contrast, formal essays, writing in the discipline, or other assignments requiring the summary of academic material are less likely to contain inclusive content.

- *High utility value.* Utility value describes the extent to which students perceive work to have worth beyond the context of grades. Increasing the utility value of assignments reduces achievement gaps (Harackiewicz, Canning, Tibbetts, Priniski and Hyde 2016). Tests, homework, formal papers, and even inclusive assignments may have low utility value because students perceive them as being completed primarily for purposes of a grade. In contrast, reflective writing, ePortfolio work, applied learning projects (such as research experiences), and

disciplinary writing are more likely to have high utility value because students believe the resulting products will have personal or professional worth.

Matrix of Culturally Relevant Assessment

Given the elements hypothesized to influence assessments, it is possible to make predictions about the risks of different assignment types. Alignment, clarity, and scaffolding should be present in all assignment types, and it is always essential to create an inclusive assessment environment. However, assignments often vary significantly along two dimensions: inclusive content and utility value. Testing appears to be the most problematic type of assessment due to problems with alignment, assessment environment, and utility value. Within testing, timed tests that use closed-ended questions and are completed in groups have the greatest potential to reveal false achievement gaps. As testing moves toward the use of open-ended questions with real-world applications, the utility value and/or inclusive content will increase and the risk of false achievement gaps should decrease.

The matrix of culturally relevant assessment shown in Figure 1 provides predictions across these dimensions. We predict that reflective writing and ePortfolio

practice will have the lowest risk of producing false achievement gaps, because students describe and apply content to their lived experiences and view assignments as useful and interesting. We predict minimal risk of false achievement gaps in inclusive assignments, which are high in inclusive content but often lack utility value. Similarly, we predict a minimal risk of false achievement gaps in writing in the discipline and applied learning, which are high in utility value but often lack inclusive content. Finally, we predict the highest risk of false achievement gaps in multiple-choice tests and formal descriptive essays, which are generally low in utility value and inclusive content.

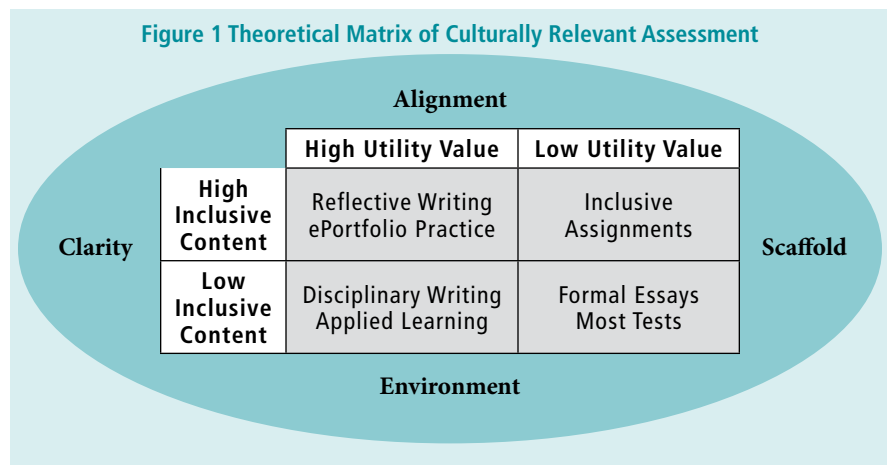## Testing the Matrix of Culturally Relevant Assessment

To explore our predictive model, we conducted repeated measures mixed analysis of variance on scores from the same students on different assignments disaggregated by underrepresented ethnic minority (URM) status. We obtained samples that were large enough to disaggregate by combining grades across three to five offerings of each class. We report results that were significant ($p < .05$) unless otherwise noted. In all comparisons, both assessment formats were designed to assess achievement of broad course-related student learning outcomes.

Theater Appreciation (64 students, 69% URM) is offered at an urban community college and assigns four inclusive writing assignments and a final multiple-choice exam. We found no evidence of an achievement gap in inclusive assignment grades (88% vs. 93%). However, URM students received lower grades than non-URM students on the multiple-choice exam (69% vs. 82%).

Child Development (110 students, 44% URM) is an introductory class offered at a public liberal arts college. We examined responses to assignments when the class was given in a traditional and an online format. Both classes assign 11 reflective

Figure 1 Theoretical Matrix of Culturally Relevant Assessment

		High Utility Value	Low Utility Value	
	High Inclusive Content	Reflective Writing ePortfolio Practice	Inclusive Assignments	
Clarity	**Low Inclusive Content**	Disciplinary Writing Applied Learning	Formal Essays Most Tests	**Scaffold**

Alignment

Environment

writing assignments and weekly open-book multiple-choice quizzes. The reflective writing assignments have been completed as part of ePortfolio practice and as stand-alone assignments. We found no evidence of an achievement gap in reflective writing in any mode of delivery (online, traditional, stand-alone, or ePortfolio; 90% vs. 93%). However, URM students in the traditional class received significantly lower quiz grades (77%) than non-URM students (86%). Interestingly, there was no evidence of an achievement gap in quiz grades from the online class (84% vs. 88%).

Experimental Psychology (137 students, 30% URM) is an advanced class at a public liberal arts college. Students complete three exams with open-ended questions and three detailed lab reports written according to disciplinary standards. We found a marginal difference ($p = .07$) between URM students' grades on tests (72%) and writing in the discipline assignments (79%) but did not find a significant difference between non-URM students' grades on the assignments (76% on tests vs. 79% on writing in the discipline).

Our data provide support for the theoretical matrix of culturally responsive assessment (see Figure 2). Achievement gaps emerged in response to many forms of testing, including multiple-choice testing that took place in a group setting either as a final exam or as a low-stakes open-book quiz. Interestingly, the same open-book quiz questions did not evoke an achievement gap when testing was completed online. We hypothesize online settings create a positive environment for students in which race and ethnicity are less salient, reducing activation of stereotype threat. Open-ended test questions appear somewhat less likely to evoke achievement gaps than other forms of testing. Although URM students received marginally higher grades on writing in the discipline assignments than open-ended test questions, there was no evidence of an achievement gap within open-ended testing when test scores were disaggregated by ethnicity. Importantly, we believe the achievement gaps revealed in test scores were false, because other assignments that were high in either utility value (reflective writing and writing in the discipline) or inclusive content (inclusive assignments) evoked equivalent evidence of competence from the same groups of students regardless of ethnicity.

Conclusions and Limitations

The work described above is a starting point for an investigation into the ways in which assessments might produce evidence of achievement gaps that do not reflect students' competence. In future work, it will be important to explore disaggregated data for other types of assignments and for other groups of students who have been historically underrepresented in higher education. ■

References

Gay, G. 2010. *Culturally Responsive Teaching: Theory, Research and Practice*. New York, NY: Teachers College Press.

Harackiewicz, J. M., E. A. Canning, Y. Tibbetts, S. J. Priniski, and J. S. Hyde. 2016. "Closing Achievement Gaps with a Utility-Value Intervention: Disentangling Race and Social Class." *Journal of Personality and Social Psychology*, *111*(5), 745–765.

Ladson-Billings, G. 1995. "But That's Just Good Teaching! The Case for Culturally Relevant Pedagogy." *Theory into Practice*, *34*(3), 159–165.

Montenegro, E., and N. A. Jankowski. 2017. *Equity and Assessment: Moving Towards Culturally Responsive Assessment* (NILOA Occasional Paper No. 29). Urbana, IL: University of Illinois and Indiana University, National Institute for Learning Outcomes Assessment.

Singer-Freeman, K. E., and L. Bastone. 2016. *Pedagogical Choices Make Large Classes Feel Small* (NILOA Occasional Paper No. 27). Urbana, IL: University of Illinois and Indiana University, National Institute for Learning Outcomes Assessment. Retrieved from http://learningoutcomesassessment.org/documents/OccasionalPaper27.pdf.

Singer-Freeman, K. E., and L. Bastone. 2018. "ePortfolio and Declarations of Academic Self: A Tale of Two Contexts." In B. Eynon and L. Gambino (Eds.), *Catalyst in Action: Case Studies of High-Impact ePortfolio Practice*. Sterling, VA: Stylus Publishing.

Steele, C. M., and J. Aronson. 1995. "Stereotype Threat and the Intellectual Test Performance of African Americans." *Journal of Personality and Social Psychology*, *69*(5), 797–811.

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Figure 2 Research Support for Theoretical Matrix of Culturally Relevant Assessment