

Assessment of High-Impact Initiatives & General Education at a Diverse Institution

By Reem Jaafar and Milena Cuéllar, LaGuardia Community College

Abstract: LaGuardia Community College is an urban, open-admission two-year college in Queens New York, serving a diverse population of approximately 20,000 degree-seeking students. Our work is driven by our mission to educate and graduate one of the most diverse student populations to shape a rapidly evolving society. In this paper we discuss the evolution of assessment of learning as practice to better measure impact to equity and ultimately better serve our students. As it is common in higher education, our metrics focus generally on retention and graduation rates, but not on equity and inclusion. Since our college serves a diverse student population, we tend to generalize that any benefits will be reaped equally by all demographics. Given strong evidence of equitable access—highlighted by the success of several high-impact initiatives—we recognize the challenges of assessing equity, inclusion and diversity in meaningful ways. We highlight several successful high-impact initiatives namely, Supplemental Instruction and developmental math reform, among others at the College. The current unsettling COVID-19 pandemic circumstances raise important concerns around equity. We end this paper with an open reflection on the metrics that are specifically targeted towards equity across all divisions, particularly from the asset-based framework and the challenges we face to improve our equity and inclusion assessment practice at the institutional level.

Who We Are and What Do We Assess?

LaGuardia Community College is an urban campus part of the City University of New York; it has a unique population of students. We are a large institution of 18,533 degree-seeking students and a large faculty body of 400 full time faculty and 700 adjunct faculty. The College serves a large and diverse body of students that hail from 158 countries and speak 89 native languages. The student body consists of 23% Asian, 17% Black, 48% Hispanic, and 12% white. 58% of students are less than 23 years old, 26% are between 23 and 29, and 16% are over 30 (LaGuardia Community College Institutional Profile 2020, 2020). One of the core values of LaGuardia Community College is diversity. The metric often used for diversity is the proportion of under-represented minorities (URM). URM are comprised of Hispanics, Blacks (Non-Hispanic) and Native Americans. Accordingly, LaGuardia's URM in Fall 2020 was 65% of the student body. The URM for Queens County, according to the US Census in 2016, was 49% of the total population. Nationally, the URM enrollment at degree-granting postsecondary institutions was 43% in Fall 2016. The Hispanic student enrollment at LaGuardia in Fall 2020 was 48% of the student population. Nationally, the Hispanic enrollment was 18% in 2016 (LaGuardia Community College Institutional Profile 2020, 2020).

In terms of financial recourses, our students live through particularly challenging circumstances: 74.2% of them have an annual income of less than \$25,000 a year, and 65% percent of the student body receives some form or financial aid. As a response, LaGuardia Community College had been ranked fifth in the economic mobility ranking for US two-year colleges (Fast Facts, 2020).

Historically, as is common nationwide, the majority of formative assessment practices at the College have focused on general education assessment of the College's core competencies. Nonetheless, our assessment strategies need to reflect the needs of our diverse College Community. Recently, the

College has pivoted to formative assessment of Administrative and Educational Service (AES) units, as well as Program Learning Outcomes (PLOs) (Assessment at LaGuardia, 2020). Across LaGuardia, our driving force is our mission and we conduct our operations according to our motto to “dare to do more.” These

efforts are highlighted by initiatives aimed at supporting learning by providing equitable access through the alignment of Academic and Student Affairs.

In 2019, the campus community participated in designing a five-year Strategic Plan. One of the five themes that emerged was to “Build Inclusive Community to Achieve the College Mission” (College Mission, 2020). Discussions by faculty, students and staff focused on the need to examine what diversity means in our unique context, and how to best support faculty, staff and students. The College Community also recommended developing strategies that use our diversity as a resource for learning. While our mission and strategic plan reinforce building an inclusive community, assessment data have not focused specifically on that angle. Our metrics focus generally on retention and graduation rates, a common practice in higher education. Given strong evidence of equitable access—highlighted by the success of several high-impact initiatives—we recognize the challenges of assessing equity, inclusion and diversity in meaningful ways. The current unsettling COVID-19 pandemic circumstances raise important concerns around equity. We share models and data, and reflect: how can we better assess equity to better serve our students?

This paper provides examples that support evidence of students’ success, which includes developmental math reforms, supplemental instruction (SI), and advising. We will highlight the success of these initiatives, including an increase in pass rates for co-requisite courses compared with traditional math sequences and the impact of graduation rates on students’ participants in our SI program. We discuss how those metrics may be improved to become specifically targeted towards equity across all divisions, particularly from the asset-based framework (Ddamulira, 2019; Ladson-Billings, 2006), and the limitations and challenges of this approach.

High-Impact “Equitable” Initiatives

Across LaGuardia, there are initiatives aimed at supporting learning by providing equitable access through the alignment of Academic and Student Affairs. High-impact practices support students holistically: even though the ultimate measure of success is graduation rate, a variety of support services help students persist through challenges. The College has been reducing systemic obstacles students face: for example, placement policies reduced the number of students taking pre-algebra (Frequently Asked Questions OAA-19-01: CUNY Developmental Education Policy Changes, 2019), and the alignment of Academic and Student Affairs provided students with consistent information and experiential learning opportunities to enhance their undergraduate experience. All these high-impact initiatives are designed to support learning, equitable access, comprehensive rules, and alignments across divisions. A large part of the success of any high impact initiatives actually depends on the joint effort of these two major divisions. Because our institution is diverse, we tend to believe that our measures and assessments of all of these initiatives will speak to equity by proxy. Although this could be an indirect way of assessing equity, it makes sense to find stronger metrics to assess equity and tackle equity deficits in more direct ways. We may have direct assessments of equity and diversity which these are often conducted silos, and our purpose it to align some of the existing metrics that we use and how it could better inform our assessment off equity at a diverse institution such as ours.

The most common metrics that are used for assessment are designed to measure performance and its dimensions: completion, transfer rate, graduation rate, success rates, access though the measure of enrollment, and progression via the measure of credit accumulation, credit completion, retention and persistence rates, etc. A comprehensive list of metrics used in postsecondary education assessment was developed by the Gates Foundation in collaboration with the Institute for Higher education policy and the Integrated Postsecondary Education Data System (Janice & Voight, 2016).

We would like to extend our assessment practices to actually measure equity through these types of commonly used metrics by disaggregating them into key student characteristics such as preparation at entry, economic status, age, race/ethnicity, financial aid status, etc. These disaggregates are critical to promoting and enhancing equity in higher education and constitute the equity metrics to make our assessment practice explicit about equity. Disaggregation by equity dimensions will allow us to view those already completed performance assessments through the lens of equity.

Supplemental Instruction Program

One example of a student support system is Supplemental Instruction (SI) by a peer mentor (Arendale, 1994; LaGuardia Community College, 2020). While the SI program at the College is over a generation old, peer mentoring programs have expanded over the past several years, namely programs aimed at helping students with advisement and the use of various technological and digital tools such as ePortfolios (Peer Programs). The SI program, also known as the Academic Peer Instruction (API) program, is an academic support peer program where student leaders audit a class, establish rapport with the students, and provide out-of-class voluntary tutoring sessions (LaGuardia Community College, 2020). The API program aims to pair high-performing students with students enrolled in high-risk courses and through this collaboration foster independent learning. However, our College serves an urban student body and first-generation college students; 65% of students receive financial aid and 56% of students are foreign born. To better address students' needs, the peer model needed modification to provide other forms of support for students. While traditional training has focused on principles of collaborative learning, a modified model incorporated a growth mindset, and helping students identify other resources available on campus including Student Technology Peer, and a Peer Advisor. With the changes of Spring 2020, the program pivoted to a distance-learning format. During the process, we learned that the distance learning format works well, because tutors were provided constant mentoring. They were able to consistently assist their students because of increased flexibility in scheduling.

Below we present sample data to describe some measure of success and we discuss its limitations in informing us about equity. In 2014-2015, we analyzed a sample of 838 API-participating students vs 959 non-API participating students in credit level courses. Data showed that API students receive higher grades, and lower withdrawal rates (Figure 1). Moreover, the compounding effects of attending is clearly demonstrated. The more sessions students attend, the higher the pass rate is (Figure 2). The matching characteristics between the API sample and the control sample were:

1. Enrolled in the same course,
2. Enrolled in that course in the same semester and session,
3. Had the same enrollment intensity for that semester (full-time/part-time),
4. Had the same range of cumulative GPA,
5. Had the same range of credits earned,
6. Had the same level of unsatisfied developmental course need,
7. Had the same gender, and
8. Had the same enrollment status (first-time, new transfer, continuing and re-admit).

Figure 1
Grade distribution of API vs non-API students

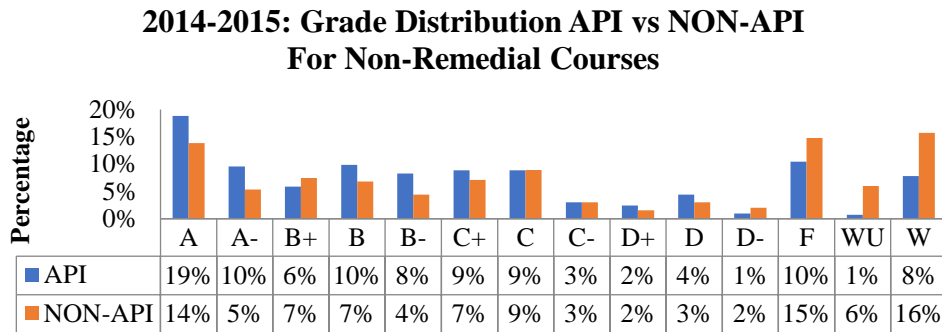
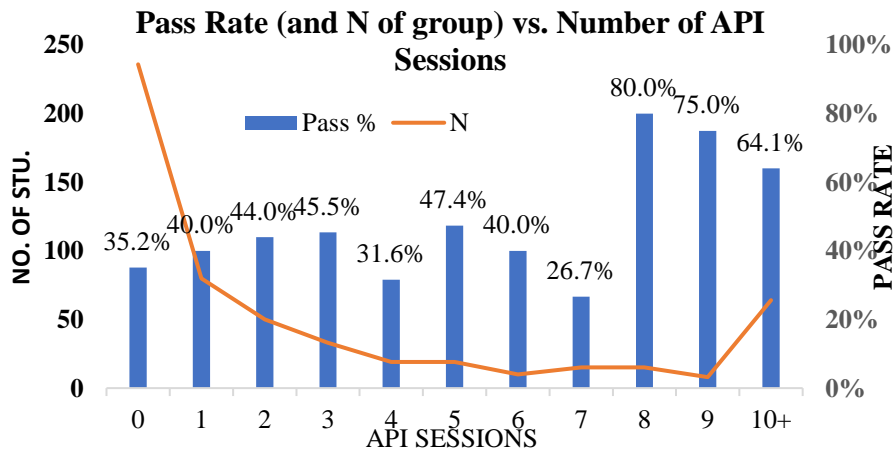


Figure 2
Pass rates as a function of the number of sessions



Similarly, in 2016-2017, data collected in credit level STEM courses showed higher pass rates for credit level STEM courses for the same matching characteristics as before.

Table 1
Pass Rates

All Courses	API 3 visits or more	Non-API	Difference	Sig. (P<.05)
Number of Students	388	1,938		
Pass Rates	86.3%	81.7%	4.7%	P=.08
Average G.P.A	2.52	2.41	0.11	No
G.P.A Standard Deviation	1.51	1.30		

In Computer science courses, the API program helped students earn a grade of B or better (this Data is from 2017-2018).

Table 2
Pass Rates for Introduction to Computer Science

Pass Rates	94% (API)	58% (Non-API)
B Grade or Higher	54% (API)	30% (Non-API)

While the data is not a random design study, but one of self-selection, data indicate that the program is helping students. However, the metrics we employ do not provide any information on equity. This is particularly relevant in the virtual space where accessibility issues compound on other equity-related issues. Students who voluntarily take advantage of opportunities provided to them may be more motivated, have more time to devote to their studies and take college more seriously. It is very difficult to factor out these effects on overall student performance. The success of the program as described doesn't reveal any information on equity.

Developmental Mathematics Reform – Guided Mathematics Pathways

At LaGuardia we have identified the entry point of the students in the math sequence to be a key element at the start-up of our students' academic journey. Mathematics placement has a highly predictive value of students' future success. From Fall 2013 to Fall 2017 at LaGuardia Community College, an average of 71% of incoming students were placed in developmental mathematics, with 61% of these students completing their developmental mathematics in one semester and only 37% of students placed into the lower level courses completing developmental mathematics courses in one year. Out of the successful students who completed remediation, only 13% acquired college credit in one year and less than 35% did so after one year or more. Our graduation rate was around 27%. At best, students who place into a traditional developmental mathematics course face a long path to degree completion and most are never able to earn the necessary math credits to complete their degree (Bailey, Jeong, & Cho, 2010). This crisis in mathematics remediation, which affects not only our college, led to widespread conversation and innovation around developmental mathematics reform. Nation-wide, 60 to 70% of community college students needed at least one developmental mathematics course, out of which about 80% never completed their developmental mathematics education (Jaggars & Stacey, 2014). Responding to this long-standing crisis in our math remediation approach, our faculty have brought transformative change to scale via the math co-requisite project (Idirissi, Cuellar & Funk, 2018). Co-requisite courses allow students placed in developmental mathematics to complete developmental education and earn college mathematics credit in a single term. This project involved transforming a fixed mathematics sequence into separate guided pathways for STEM and non-STEM students.

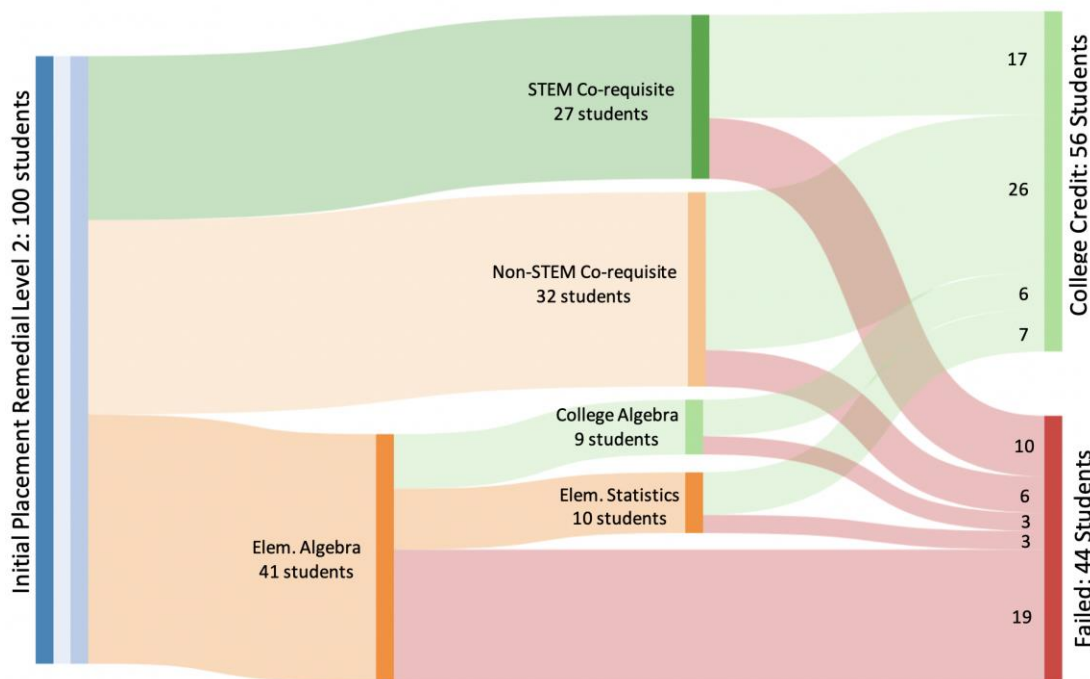
This reform exemplifies how the transformation of the mathematics sequence into guided pathways reduced achievement gaps for our students, and increased gateway completion, academic momentum, retention and graduation rates. Note that the developmental mathematics reform was scaled up at LaGuardia before CUNY-wide change placement practices from placement exams to a mathematics placement index (Frequently Asked Questions OAA-19-01: CUNY Developmental Education Policy Changes, 2019), a key factor in students' success in higher education (Barnett et al. 2018).

The enterprise of implementing the guided pathways at LaGuardia happened in a timeline expanding from Spring 2013 to the present and entailed a strong collaboration of both academic and students' affairs down to the individual level, not only involving faculty and staff but also departmental up to executive administration (see Figures 1 and 2 of Idrissi, Cuellar, & Funk, 2018). The three guided mathematics pathways are composed of three co-requisite courses, each targeting a particular set of majors and programs. These three new co-requisite courses were implemented on a staggered schedule so that we could learn and refine our implementation at scale as we identified the needs at all levels, including curriculum, professional development, research office data and communication, advising, program and course requirement alignment, etc, to name just a few contributing parts to the reform process.

After five years of implementing the first two courses in the new guided pathways, our new mathematics course sequence contributed along with other initiatives to improve outcomes for our students across the board to increase our five-year graduation rate up to 32% in 2017. It contributed to the speed and volume of credit accumulation for students deemed not college ready or placed in developmental mathematics.

Figure 3

Pipeline of 100 students placed at upper level remedial (elementary algebra) level to acquire college level through the traditional or guided pathway. Traditional pathway starts with the Elementary Algebra course while the guided pathway with any of the co-requisite courses. Averages are calculated for Fall 2016 to Spring 2018.



Reading Figure 3 from left to right, we can visualize the progress of 100 students placed in developmental education toward college credit completion, depending on their path. Their path is defined by being enrolled in the new guided pathways (STEM and non-STEM co-requisite courses) or the traditional sequence of developmental mathematics courses (elementary algebra plus a college course requirement). Out of the 100, only 13 acquired college credit in the traditional path compared to 53 students who acquired college credit and completed their developmental mathematics requirement in only one term. Just by looking at Figure 3, we can see that the introduction of the guided pathways increased the chances to acquire college credit by a student deemed not college ready by about three times in half the time.

In general, these co-requisite courses benefit populations that are traditionally misrepresented and deemed more frequently as not-college ready, as it is the case for Hispanic and Black students enrolling in college-mathematics classes for the first time. The courses enrolled a proportion of Hispanic (47%) and Black (21%) students that is similar to our institutional profile, therefore providing us the opportunity to address equity in higher education at a local scale. Success rates for these students is equal to or higher than the overall success rates during the period between Spring 2015 to Fall 2018. What brings everything together in a diverse institution with an equity goal is the productive alignment of student and academic affairs to implement successful initiatives. And by success we mean that the outcomes are positive for all students in the college.

Collaborations Across High-Impact Initiatives

The SI program closely worked with the math department during the implementation of the co-requisite math courses. As detailed in this paper, mathematics reforms have eliminated barriers preventing students from progressing towards degree completion (Idrissi et al., 2018). API leaders worked with math faculty to help students in co-requisite courses. Leaders also attended faculty training in the implementation phase of those courses. The results of this effort resulted in higher pass rates for those attending API sessions: in a controlled experiment from 2015-2018, results analyzed by the office of Institutional Research and Assessment show that for the co-requisite non-STEM math courses at LaGuardia, the pass rates for students who attend ten sessions or more a semester is 96%, compared to 77% to those who did not attend. Clearly, attending weekly out-of-class sessions has a tremendous effect on course completion. In this course, students across sections took a common online midterm and a written department final exam. This ensured little variability in grading standards. Additionally, research showed that the “STEM co-requisite course presents higher variability in pass rates by racial/ ethnicity group the non-STEM co-requisite course arguably due to the higher volume of emotional and cognitive pedagogical components immersed in the Carnegie Math Pathways curriculum,” in comparison to the more traditional curriculum of the STEM co-requisite course (Idrissi et al., 2018).

Limitations to Measure Equity: How to better produce assessment with a focus on equity?

The data presented about the API program did not include any breakdown by demographics, but one can sense from the non-STEM co-requisite course results that several factors come into play in determining success. Data on advisement provided by the College show that retention rates are higher for students who receive advisement from faculty and staff. In the spirit of aligning and streamlining efforts, the API training has focused on training their leaders to provide referral points to students, especially at pivotal moments during the semester. API(?) leaders are not professional advisors, but they do encourage students to contact their advisors to seek guidance. We are not sure, however, which demographic variables to track in order to predict who might need more help. Some unconventional metrics may include success rates by parenting status and age group, in addition to gender. Internet access is another metric that needs to be factored in the presence of the distance learning environment. The College provided devices to students in need, in an effort to eliminate inequity in device access, and assessment of this measure is currently underway. Those metrics may better highlight areas that the College and the program need to address. Addressing these areas may involve different departments and divisions, but given our alignment of divisions at the College, we can collaborate to address issues that prevent students from succeeding.

Advisement data itself provides retention and graduation metrics by cohort, without accounting for demographics. Most often first-generation students need to juggle multiple responsibilities, both personal or job related. The breakdown of results needs to account for work-status, parenting status, and a breakdown by ethnicity to start addressing gaps in achievements. For instance, while certain cultures emphasize the importance of group work, others do not. Yet research backs the success of students who work in groups, specifically first-generation college students (see for example Treisman, 1992). A profile of students may aid faculty in identifying approaches that may be new to students but would be beneficial to their retention. In our opinion, a comprehensive and informative assessment of high impact initiatives with the lens of equity could be only achieved by combining the following ingredients:

- (1) eliminating systemic barriers to students' opportunities to access and success in mathematics and their general education as it has been presented in this paper.
- (2) actively working across divisions to change institutional cultures and mindsets of faculty and higher education staff toward identifying and fostering student assets and student strengths instead of looking from a deficit perspective at students' background and skills upon arrival at our institutions.

At many institutions, including LaGuardia, disaggregating assessment results to understand equity gaps is one of the main challenges (Charles A. Dana Center, 2020). Professional development is needed to recognize success gaps in our student populations. Understanding these gaps will help change current assumption that some students may lack the ability to succeed. Using our disaggregated assessment results will help us to engage diverse audiences and voices in conversations regarding success and improvement. How we talk about our students and their success can have a major impact on how we think about improving achievement gaps (Ddamulira, 2019). We would like to start to shift how we frame our data to change how to improve student success.

To assess disparities of achievement, disaggregated data must be used to inform better practice by putting inequities in education in the proper context to reveal disparities and achievement gaps. Contextualization of achievement gaps are not necessarily reflective of natural abilities of our students; on the contrary, we would like to frame this contextualization as providing opportunities to succeed.

The change of the institutional culture we would like to see when assessing equity will have to view those disparities revealed by data disaggregation, e.g. achievement gaps, as a societal education debt (Ladson-Billings, 2006), not gaps. The concept of education debt instead of gap acknowledges the intergenerational denial of equity for access to quality resources for marginalized and minoritized communities, in contrast to the intergenerational investment of resources with non-marginalized communities.

There is no "one size fits all" solution. Institutions need to identify student success metrics that can be measured and acted upon, and disseminate the information to the wider College Community in equitable ways. This will help pave the way to a more equity-minded assessment in higher education.

References

- Arendale, D. (1994). Understanding the supplemental instruction model. In D.C. Martin & D. Arendale (Eds.), *Supplemental instruction: Increasing achievement and retention* (pp.11-21). New Directions for Teaching and Learning No. 60. San Francisco, CA: Jossey-Bass Publishers. Retrieved from <http://www.tc.umn.edu/~aren011/Sloverview94.pdf>.
- Assessment at LaGuardia. *LaGuardia Community College website*. Retrieved October 5, 2020, from <https://www.laguardia.edu/assessment/>
- Bailey, T., Jeong, D. W., & Cho, S.W. (2010). *Referral, enrollment, and completion in developmental education sequences in community colleges*. *Economics of Education Review*, 29, 255–270.
- Charles A. Dana Center at The University of Texas at Austin. (2020). *Launch Years: A New Vision for the Transition from High School to Postsecondary Mathematics*. Austin, TX: Author. Available via <https://utdanacenter.org/launchyears>
- College Mission. *LaGuardia Community College website*. Retrieved October 5, 2020, from <https://www.laguardia.edu/mission/>
- Ddamulira, J. (2019, February 19). Asset Framing: Students Aren't Empty Cups. Retrieved October 5, 2020, from <https://dataqualitycampaign.org/asset-framing-students-arent-empty-cups/>
- Jaggars, S., & Stacey, G.W. (2014, January). *What we know about developmental education outcomes*. Retrieved October 5, 2020 from <http://ccrc.tc.columbia.edu/media/k2/attachments/what-we-know-about-developmental-education-outcomes.pdf>
- Fast Facts. (2020). Retrieved October 9, 2020, from <https://www.laguardia.edu/fast-facts/>
- Frequently Asked Questions OAA-19-01: CUNY Developmental Education Policy Changes. (2019). Retrieved October 09, 2020, from <https://www.cuny.edu/academics/academic-policy/dev-ed-faq/>
- Idrissi, A., Cuellar, M., & Funk, J. (2018). *Co-requisite mathematics models and gateway completion: A systematic approach to leading change at scale* (Steps to Success series). Denver, CO: Strong Start to Finish, Education Commission of the States.
- Janice, A., & Voight, M. (2016, May). *Toward convergence: A technical guide for the postsecondary metrics framework*. Washington, DC: Institute of Higher Education Policy.
- Ladson-Billings, G. (2006). From the Achievement Gap to the Education Debt: Understanding Achievement in U.S. Schools. *Educational Researcher*, 35(7), 3–12. <https://doi.org/10.3102/0013189X035007003>
- LaGuardia Community College Institutional Profile 2020. (2020). Retrieved October 9, 2020, from https://www.laguardia.edu/uploadedFiles/Main_Site/Content/IR/docs/Institutional-Profile-2020.pdf
- LaGuardia Community College. (2020). *Academic peer instruction (API)*. Retrieved from <http://www.laguardia.edu/api/>
- Peer Programs. (n.d.). Retrieved September 02, 2020, from <https://www.laguardia.edu/peerprograms/>
- Treisman, U. (1992). Studying Students Studying Calculus: A Look at the Lives of Minority Mathematics Students in College. *The College Mathematics Journal*, 23(5), 362. doi:10.2307/2686410

About the Authors

Dr. Reem Jaafar is Professor & Co-Director, of Academic Peer Instruction (API) in the Department of Mathematics, Engineering and Computer Science at LaGuardia Community College. She can be reached at rjaafar@lagcc.cuny.edu.

Dr. Milena Cuéllar is Professor of Mathematics at LaGuardia Community College. She can be reached at mcuellar@lagcc.cuny.edu.