RESEARCH REPORT September 30, 2020

# Measuring the Whole Student

Landscape Review of Traditional and Holistic Approaches to Community College Student Success

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### **Executive Summary**

As colleges and universities work to enhance student success, they frequently use traditional outcome-based metrics—such as graduation rates, year-to-year retention, and post-graduation employment—to define that "success." These measurements, which throughout this report we refer to as traditional metrics, are often prioritized across higher education given their impact on and consequences toward institutional decision-making, benchmarking, and most importantly, funding. While these quantitative metrics can provide a useful—albeit limited view into student experiences inside and outside of the classroom, they often focus on first-time, full-time, degree/certificate-seeking students, who are more likely to be found at four-year institutions.

Due to their open admissions policies and primarily non-residential offerings, community colleges more often reflect the demographic composition of their local community and contain a more diverse student body, including older students, student parents, those employed full- or part-time, and a larger share of students from historically underserved groups than at four-year colleges and universities. As such, traditional metrics for some time have not sufficiently considered the vast array of different types of community college students, nor their challenges, including those related to basic needs and well-being.

Further, in recent months, evidence has begun to emerge on how the global pandemic has disproportionately disrupted the educational trajectory of these "post-traditional" students, further discounting the value of traditional metrics given their focus on a limited segment of post-secondary students. As such, greater collection and prioritization of holistic metrics of student success—that is, those that reflect the student and their experience as a whole—creates the potential for a more accurate depiction of the success of two-year college students and their institutions.

Through the Holistic Measures of Student Success (HMSS) project, we will unpack and explore how student success has traditionally been defined and measured within the community college sector and what new metrics and data collection processes can be developed to more holistically reflect the community college student experience. Therefore, this project aims to (1) establish a shared understanding of current institutional practices in defining student success, and (2) measure the sector's openness to new approaches, especially those focused on students' basic needs.

This report—the first in a series from the project—provides a landscape review of how metrics of student success are currently prioritized, defined, quantified, and used in higher education. Additionally, this report will examine in particular what holistic metrics are currently being utilized and how they are defined within the sector. Subsequent reports from this project will discuss interviews and survey findings of community college institutional research directors and

<sup>&</sup>lt;sup>1</sup> Michelle Dimino, "How Outcomes Metrics can Better Reflect Community College Performance," Third Way, October 2019, https://www.thirdway.org/report/how-outcomes-metrics-can-better-reflect-community-college-performance.

provosts, culminating in a final report on newly proposed holistic approaches and metrics for institutional data collection and assessment processes.

#### Acknowledgements

We thank ECMC Foundation, in particular our program officer Angela Sanchez, for supporting this project as well as the learning community established by Education Northwest across the Basic Needs Initiative cohort of grant recipients.<sup>2</sup>

We also thank our external advising committee for their expert guidance and support throughout the project:

- Kimberly Cacciato, Student, The College of New Jersey
- Cara Crowley, Vice President of Strategic Initiatives, Amarillo College
- Linda García, Executive Director, Center for Community College Student Engagement
- Pam Eddinger, President, Bunker Hill Community College
- Wayne Taliaferro, Strategy Officer for Finance and Federal Policy, Lumina Foundation
- Paula Umaña, Director of Community Impact, Hope Center for College, Community, and **Justice**

We are immensely grateful to Ithaka S+R colleagues Janan Shouhayib and Kimberly Lutz for their input on this report. This project would not be possible without their substantive contributions.

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<sup>&</sup>lt;sup>2</sup> For more information on the Basic Needs Initiative cohort: https://www.ecmcfoundation.org/informed/2019/ecmcfoundation-launches-basic-needs-initiative.

# Current Landscape of Student Success Metrics

First, we present some of the most common organizations to which community colleges submit institutional and student data, and the characteristics that define data elements specifically associated with traditional outcome metrics. While definitions for student outcomes vary slightly across organizations, particularly in how "typical" time to degree and demographic items are presented, there is a great deal of commonality across the collection efforts.

#### Integrated Postsecondary Educational Data System

The Integrated Postsecondary Educational Data System (IPEDS) is a series of annual surveys largely concerning institutional characteristics, student enrollment, financial aid and college financing, and student outcomes, maintained by the US Department of Education's National Center for Education Statistics (NCES).<sup>3</sup> Every institution that participates in federal student aid programs under Title IV must submit data to IPEDS. More than 7,500 institutions complete the IPEDS surveys every year, and of those institutions, there are currently 1,035 not-for-profit (public and private) institutions that exclusively and predominately offer associate degrees included in the IPEDS universe. 4 Anyone can make use of these publicly available, archived data, which are not only influential for federal funding, but are important for external research, rankings, and benchmarking.

IPEDS is mandated by the Higher Education Opportunity Act (HEOA) of 2008 to not collect data at the student level in order to maintain student privacy, and therefore must only include data at the institutional level.<sup>5</sup> To expand upon the current success metrics collected and work around an inability to collect student-level data, NCES has incorporated additional studies to include additional metrics, thus expanding their scope and capturing a wider array of students.

There are four IPEDS surveys related to student outcomes—the Completions (C), Graduation Rates (GR), Graduation Rates 200% (GR200), and Outcome Measures (OM) surveys.

The Completions survey is a longstanding IPEDS survey that assesses the number of students who attain postsecondary awards (those that are "completers"), as well as the volume of postsecondary awards granted to students (the amount of "completions").6 Completions can be disaggregated by students' gender, race or ethnic background, fields of study, and award level (such as either a certificate or an associate's degree). Completers can also be disaggregated by students' age. An institution often reports more completions than completers, as students can

<sup>&</sup>lt;sup>3</sup> "About IPEDS," National Center for Education Statistics, https://nces.ed.gov/ipeds/about-ipeds.

<sup>&</sup>lt;sup>4</sup> Including institutions within the public and private-not-for-profit sectors via the sector variable via IPEDS, as well as all associate's colleges, associate-dominant and special focus, two-year classifications within the Carnegie Classification 2018: Basic variable via IPEDS.

<sup>&</sup>lt;sup>5</sup> Susan M. Dynarski, Steven W. Hemelt, and Joshua M. Hyman, "The Missing Manual: Using National Student Clearinghouse Data to Track Postsecondary Outcomes," Educational Evaluation and Policy Analysis, 37, no. 1S, (May 2015): 53S-79S, https://doi.org/10.3102/0162373715576078.

<sup>&</sup>lt;sup>6</sup> "Completions," National Center for Education Statistics, June 2019, https://nces.ed.gov/pubs2019/2019007.pdf.

graduate with multiple degrees at a time. The data collected via this survey deviates from the GR and GR200 surveys in that these data are only head counts of completed students and degrees.

The Graduation Rates survey, added to IPEDS following the Student Right-to-Know and Campus Security Act of 1990, provides rates at which student cohorts graduate or complete a program within a specified timeframe. 7 Data are disaggregated by race and ethnicity, gender identity, and Pell Grant status to better account for differences in matriculation and outcomes between student subgroups.8 Graduation rates calculated for this survey measure first-time, full-time, degree/certificate-seeking students that complete their program within 150 percent of the normal period of time.9

Additionally, as part of the Higher Education Opportunity Act of 2008 (HEOA), IPEDS introduced the GR200 survey in order to capture students who complete and graduate from their program at 200 percent of the normal time to degree.

The Outcome Measures survey is the most recent addition to IPEDS and collects data on the enrollment statuses and degree awards of degree/certificate-seeking students, analyzing four student cohorts at different enrollment intensities: students who are full-time, first-time; parttime, first-time; full-time, non-first-time; or part-time, non-first time. <sup>10</sup> The OM survey tracks completion at two different points (six and eight years from entering college) that are not contingent on the percentage of a "normal" time to degree as used in other IPEDS metrics. While the OM metrics are disaggregated by Pell Grant status, they do not disaggregate on students' race and ethnic background, age, or gender identity.11

#### National Student Clearinghouse

The National Student Clearinghouse (NSC) is an independent, nonprofit organization to which institutions voluntarily submit data on enrollment, completions, majors, and type of degrees

<sup>&</sup>lt;sup>7</sup> "Graduation Rates," National Center for Education Statistics, December 2016, https://nces.ed.gov/pubs2017/2017046.pdf.

<sup>&</sup>lt;sup>8</sup> Aida Aliyeva, Christopher A. Cody, and Kathryn Low, "The History and Origins of Survey Items for the Integrated Postsecondary Education Data System (2016-17 update)," U.S. Department of Education, Washington D.C.: National Postsecondary Education Cooperative, 2018, https://nces.ed.gov/ipeds/pdf/NPEC/data/NPEC Paper IPEDS History and Origins 2018.pdf.

<sup>&</sup>lt;sup>9</sup> "First-time" is defined by IPEDS as students that have no postsecondary experience prior to their enrollment at their institutions. "Full-time" refers to students who are enrolled in 12 or more credits a semester or quarter according to IPEDS. "Degree/certificate-seeking" refers to students who are enrolled in courses for credit who are seeking a degree, certificate, or other recognized postsecondary credential according to IPEDS. "IPEDS Survey Components: Graduation Rates (GR)," National Center for Education Statistics, https://nces.ed.gov/ipeds/use-the-data/surveycomponents/9/graduation-rates; "IPEDS 2019-20 Data Collection System: Glossary Search," National Center for Education Statistics. https://surveys.nces.ed.gov/ipeds/VisGlossaryAll.aspx.

<sup>&</sup>lt;sup>10</sup> Aida Aliyeva, Christopher A. Cody, and Kathryn Low, "The History and Origins of Survey Items for the Integrated Postsecondary Education Data System (2016-17 update)," U.S. Department of Education, Washington D.C.: National Postsecondary Education Cooperative, 2018,

https://nces.ed.gov/ipeds/pdf/NPEC/data/NPEC Paper IPEDS History and Origins 2018.pdf.

<sup>&</sup>lt;sup>11</sup> "2019-20 Survey Materials FAQ, Outcome Measures," IPEDS, https://surveys.nces.ed.gov/IPEDS/VisFaqView.aspx?mode=reg&id=14&show=all#1100.

awarded.<sup>12</sup> The NSC was originally developed to collect and report on the enrollment of student borrowers and non-borrowers to lenders, positioning them to collect data at the student level. The NSC acts as a steward of the data they collect, providing various free and for-fee administrative services such as data verification, exchange, and analysis. 13

The NSC provides unique coverage of the US higher education landscape. It is not required to collect data on institutions receiving federal student aid under Title IV or use federallydetermined definitions of metrics, and it also has the ability to collect data at the student level.<sup>14</sup> The NSC currently includes 97 percent of students currently enrolled in postsecondary education, 94 percent of all degrees awarded in the United States, and 99 percent of public and private institutions. 15 However, previous analysis of NSC data coverage has found that the NSC misses a disproportionate level of participation from smaller as well as for-profit institutions.<sup>16</sup>

Data required for NSC submission, such as enrollment compliance reporting and other demographic data, comply with NCES definitions for IPEDS metrics—easing the submission process so that institutions can send these analogous data to both organizations. 17 Many of the data elements added to the NSC's collection over time were developed in-house and in consultation with the Clearinghouse Advisory Committee (CAC).<sup>18</sup>

The NSC tracks student outcomes after six and eight years from entering an institution regardless of the "normal" amount of time to attain a degree, similar to IPEDS OM survey metrics.<sup>19</sup> Additionally, the NSC definition of a full-time student includes those who are exclusively enrolled full-time in every term throughout their degree, compared to IPEDS which defines full-time students as those who are enrolled full-time only during the term at which they enter an institution.<sup>20</sup> This most likely is due to the ability of the NSC to track student behavior at an individual level, such as changes in enrollment intensity per term, transfers in or out of an

<sup>&</sup>lt;sup>12</sup> Afet Dundar and Doug Shapiro, "The National Student Clearinghouse as an Integral Part of the National Postsecondary Data Infrastructure," *National Student Clearinghouse Research Center,* May 2016, http://www.ihep.com/sites/default/files/uploads/postsecdata/docs/resources/national\_student\_clearinghouse.pdf.

<sup>&</sup>lt;sup>13</sup> Ibid.

<sup>&</sup>lt;sup>14</sup> Ibid.

<sup>&</sup>lt;sup>15</sup> "National Student Clearinghouse Fact Sheet," 2020, https://studentclearinghouse.info/onestop/wpcontent/uploads/NSCFactSheet.pdf.

<sup>&</sup>lt;sup>16</sup> Susan M. Dynarski, Steven W. Hemelt, and Joshua M. Hyman, "The Missing Manual: Using National Student Clearinghouse Data to Track Postsecondary Outcomes," Educational Evaluation and Policy Analysis, 37, no. 1S, (May 2015): 53S-79S, https://doi.org/10.3102/0162373715576078.

<sup>&</sup>lt;sup>17</sup> Afet Dundar and Doug Shapiro, "The National Student Clearinghouse as an Integral Part of the National Postsecondary Data Infrastructure," National Student Clearinghouse Research Center, May 2016, http://www.ihep.com/sites/default/files/uploads/postsecdata/docs/resources/national\_student\_clearinghouse.pdf.

<sup>18</sup> Ibid.

<sup>&</sup>lt;sup>19</sup> Jolanta Juszkiewicz, "Trends in Community College Enrollment and Completion Data, Issue 5," American Association of Community Colleges, May 2019, https://www.aacc.nche.edu/wpcontent/uploads/2019/05/CCEnrollmentMarch2019Final.pdf.

<sup>&</sup>lt;sup>20</sup> Ibid.

institution, as well as transfer across state lines. 21 The NSC also collects many metrics on student demographics, such as gender, race and ethnicity, and majors.

#### Voluntary Framework of Accountability

The American Association of Community Colleges (AACC) created the Voluntary Framework of Accountability (VFA) in order to provide a set of metrics that specifically hold community colleges accountable in their efforts to attain their missions, and better compare student outcomes across colleges. The VFA was developed by community college leaders and for community colleges in an effort to provide the sector with a more adequate set of metrics that take a wider array of students into account, moving beyond first-time, full-time, and degree/certificate-seeking students. VFA metrics are at the student level, and also include different types of educational formats offered, such as workforce outcomes from career and technical education (CTE), pre-collegiate adult basic education (ABE), as well momentum and developmental progress.

As its name suggests, data are collected on a voluntary basis, and thus the coverage of institutions is not as robust as the coverage of postsecondary institutions by IPEDS and the NSC.<sup>22</sup> In 2018, a little more than 200 community colleges participated in the VFA.<sup>23</sup>

VFA metrics cover three distinct areas of community college education, including student progress and outcomes (SPO), CTE, and ABE, at three time points—after one year from enrollment, two years post-enrollment, and six years post-enrollment. <sup>24</sup> In addition to prioritizing outcome-based metrics, the VFA captures developmental metrics on the credit accumulation of students throughout their time at an institution. Three different student cohorts are reported on within the VFA: the Main Cohort, Credential-Seeking cohort, and First-Time in College (FTIC) cohort. 25

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<sup>&</sup>lt;sup>21</sup> Afet Dundar and Doug Shapiro, "The National Student Clearinghouse as an Integral Part of the National Postsecondary Data Infrastructure," National Student Clearinghouse Research Center, May 2016, https://nscresearchcenter.org/wp-content/uploads/NSC-as-an-Integral-Part-of-the-National-Postsecondary-Data-Infrastructure.pdf.

<sup>&</sup>lt;sup>22</sup> "The Voluntary Framework of Accountability: Developing Measures of Community College Effectiveness and Outcomes," American Association of Community Colleges, February, 2012, https://vfa.aacc.nche.edu/Documents/VFAOutcomesReportWebFINAL.pdf.

<sup>&</sup>lt;sup>23</sup> "Driving Success: VFA Summary Report: Leading Indicators of Success and Student Outcomes for Community Colleges," American Association of Community Colleges, 2019, https://www.aacc.nche.edu/wpcontent/uploads/2019/04/VFA\_Summary\_Report\_2019.pdf.

<sup>&</sup>lt;sup>24</sup> "Community College Measures of Effectiveness," Voluntary Framework of Accountability, American Association of Community Colleges, https://vfa.aacc.nche.edu/Documents/VFABrochureLowResolution.pdf; Kent A. Phillippe, "Voluntary Framework of Accountability Metrics Manual Version 8," American Association of Community Colleges, October 2019, https://vfa.aacc.nche.edu/Documents/VFAMetricsManual.pdf.

<sup>&</sup>lt;sup>25</sup> The Main cohort includes every student who enters an institution for the first time after completing high school in the fall semester, including students enrolled full- and part-time, and those who are degree- and non-degree seeking, as well as transfer-in students. The Credential-Seeking cohort includes students from the Main cohort who are identified based on the amount of courses and credits attained—taking at least 12 credit hours or equivalent at the end of their second year. "FTIC cohort includes students from the Main cohort who enroll full-time or part-time at an institution with no prior postsecondary experience, using IPEDS definition of "first-time." "Driving Success: VFA

Completion not only includes those who have completed a credential or degree, but also noncredit completion which includes students who complete non-credit courses that provide valuable training for the labor market and those who transfer without a credential. <sup>26</sup> VFA tracks student transfer across state lines similar to NSC, but can differentiate students who have transferred out after earning a credential and those who transfer out without earning a credential. <sup>27</sup> Additionally, the VFA can disaggregate data by gender, racial and ethnic background, age, level of developmental need at entrance (college ready/not college ready), Pellgrant award status, and enrollment intensity.

#### "Traditional" & "Post-Traditional" Students

Traditional metrics, as documented through three of the most major collection efforts, most often measure students that are first time, full-time, and degree/certificate-seeking. Intuitively, these characteristics are also often thought of as comprising a "traditional student" pursuing higher education. While traditional metrics tend to represent traditional students and their milestones, these metrics often exclude other types of students that comprise a large share of the community college student population. As of this year, 47 percent of community college students are enrolled in non-credit-bearing courses and two-thirds are enrolled part-time. <sup>29</sup>

Therefore, given the extent to which traditional metrics of success focus on the experiences of "traditional" students, these measurements tend to fall short in documenting the success of community colleges. Not only are current approaches misleading to various stakeholders for benchmarking and decision making, but they can have substantial impacts on funding. For instance, only full-time-equivalent students were recently factored into the algorithm determined by the Department of Education for allocation of funds for the CARES Act—leading to disproportionately lower funding allocated to community colleges that have higher rates of part-time students than four-year colleges.<sup>30</sup>

"Non-traditional" students, which have become of growing interest across higher education given shifts in demographics of those enrolled across the sector, are typically defined as students who satisfy various characteristics such as those who are over the age of 25, attend college part-

Summary Report: Leading Indicators of Success and Student Outcomes for Community Colleges," *American Association of Community Colleges*, 2019, <a href="https://www.aacc.nche.edu/wp-content/uploads/2019/04/VFA\_Summary\_Report\_2019.pdf">https://www.aacc.nche.edu/wp-content/uploads/2019/04/VFA\_Summary\_Report\_2019.pdf</a>.

<sup>&</sup>lt;sup>26</sup> Kent A. Phillippe, "Voluntary Framework of Accountability Metrics Manual Version 8," *American Association of Community Colleges*, October 2019, https://vfa.aacc.nche.edu/Documents/VFAMetricsManual.pdf.

<sup>&</sup>lt;sup>27</sup> Ibid.

<sup>&</sup>lt;sup>28</sup> Jolanta Juszkiewicz, "Trends in Community College Enrollment and Completion Data, Issue 5," *American Association of Community Colleges*, May 2019, <a href="https://www.aacc.nche.edu/wp-content/uploads/2019/05/CCEnrollmentMarch2019Final.pdf">https://www.aacc.nche.edu/wp-content/uploads/2019/05/CCEnrollmentMarch2019Final.pdf</a>.

<sup>&</sup>lt;sup>29</sup> "AACC Fast Facts 2020," *American Association of Community Colleges*, March 2020, https://www.aacc.nche.edu/research-trends/fast-facts/.

<sup>&</sup>lt;sup>30</sup> Carrie R. Welton, Sara Goldrick-Rab, and Andy Carlson, "Resourcing the Part-Time Student: Rethinking the Use of FTEs in Higher Education Budgets," *The Hope Center for College Community, and Justice,* May 2020, <a href="https://hope4college.com/wp-content/uploads/2020/05/RealCollege\_PolicyBrief\_HCvFTE.pdf">https://hope4college.com/wp-content/uploads/2020/05/RealCollege\_PolicyBrief\_HCvFTE.pdf</a>.

time, are working full-time, or have dependents. According to the US Department of Education, for example, "non-traditional" students are those who may be financially independent, have dependents, are single parents, do not have a high school diploma, delay entering a postsecondary institution, enrolled part-time, or are working full-time.<sup>31</sup>

A large share of community college students tends to fulfil "non-traditional" characteristics. Approximately 15 percent of students at community colleges in 2020 are single parents, a third are currently receiving federal Pell Grants to afford their courses, and 62 percent of all full-time and 72 percent of part-time students are currently working part- or full-time to cover expenses. 32 But, as the proportion of "non-traditional" students in higher education continues to increase, especially at community colleges, using the term "non-traditional" may now be incorrect and restrictive, as it emphasizes students' lack of traditional characteristics rather than the circumstances they do bring to the college experience.

Therefore, the term "post-traditional" can be used as an alternative to "non-traditional," given its inclusive approach toward students who are older than 25, financially independent, employed, and/or have dependents.<sup>33</sup> Using the prefix of "post" emphasizes the trajectory of higher education, as the current student body moves away from traditional definitions and characteristics of college students.<sup>34</sup> As such, the remainder of this report and subsequent reports from this project will refer to "non-traditional" students as "post-traditional."

# **Applications of Student Success Metrics**

Next, we explore how traditional metrics of student success are currently used for funding, accreditation, and ranking purposes. Additionally, an analysis of community college websites yields insights on the transparency of federally required and other publicly available information to current and prospective students. We have intentionally omitted from the analysis in this report the many types of data collected and used for internal decision-making and improvements that are not publicly available; these data will be explored in subsequent phases of the project.

<sup>31 &</sup>quot;Web Tables: U.S. Department of Education: Demographic and Enrollment Characteristics of Nontraditional Undergraduates: 2011-12," NCES, September 2015, https://nces.ed.gov/pubs2015/2015025.pdf.

<sup>32 &</sup>quot;AACC Fast Facts 2020," American Association of Community Colleges, March 2020, https://www.aacc.nche.edu/research-trends/fast-facts/.

<sup>33</sup> Louis Soares, Jonathan S. Gagliardi, and Christopher J. Nellium, "The Post-Traditional Learners Manifesto Revisited: Aligning Postsecondary Education with Real Life for Adult Student Success, American Council on Education, 2017, https://www.issuelab.org/resources/14659/14659.pdf and https://www.acenet.edu/Documents/The-Post-Traditional-Learners-Manifesto-Revisited.pdf.

<sup>&</sup>lt;sup>34</sup> Matthew Venaas, "From Non-Traditional to Post-Traditional," Skyfactor Benchworks, February 2018. https://www.skyfactor.com/non-traditional-post-traditional/.

#### State Funding

Approximately a third of community college revenues in recent years have come from state resources—the largest share of incoming revenue compared to tuition, local, and federal funding dollars. 35 Historically, many states have determined allocation of funds based on the number of students a college enrolls. However, over time, many states—29 currently—have moved to a performance-based funding model to incentivize favorable outcomes over purely enrollment statistics.36

Performance-based funding models intend to reward institutions that focus their efforts on increasing student completion and degree attainment. By shifting the focus from student entry to outcomes, these models may help to encourage improvements of student services to provide additional support, as well as the implementation of new policies to promote persistence and completion.<sup>37</sup> Metrics associated with performance-based funding models are typically traditional outcome measures, such as retention, graduation, transfer, on-time graduation, and post-graduation outcomes.38

These models also have the ability to incentivize equitable outcomes, as some states provide additional financial incentives for institutions who attain high retention and completion rates of students that have been historically underrepresented in higher education, such as students of color, Pell Grant recipients, and first-generation students. Some states also provide incentives for institutions that award degrees in "high-need" fields such as science, technology, engineering, and mathematics (STEM). Two-year colleges are in a unique position under these funding models, as they have the ability to award more degrees and certificates in high-need fields and serve a higher proportion of historically underrepresented students compared to fouryear institutions.39

<sup>35</sup> Kent Phillippe, Rahel Tekle, and Matthew Dembicki, "DataPoints: Community College Revenues," Community College Daily: American Association of Community Colleges, July 2020, https://www.ccdaily.com/2020/07/datapointscommunity-college-revenues/.

<sup>&</sup>lt;sup>36</sup> Amy Y. Li, "Lessons Learned: A Case Study of Performance Funding in Higher Education," Third Way, October 2018, updated January 2019, https://www.thirdway.org/report/lessons-learned-a-case-study-of-performance-fundingin-higher-education.

<sup>&</sup>lt;sup>37</sup> Ibid; Kelly Rosinger et. al., "The Landscape of Performance-Based Funding in 2020," InformEd States: Higher Education Policy Initiative, January 2020, https://static1.squarespace.com/static/5d9f9fae6a122515ee074363/t/5e3454ad239e650b8423af24/1580487858341/l

S Brief LandscapeofPBF-2020.pdf.

<sup>38</sup> Amy Y. Li, "Lessons Learned: A Case Study of Performance Funding in Higher Education," Third Way, October 2018, updated January 2019, https://www.thirdway.org/report/lessons-learned-a-case-study-of-performance-fundingin-higher-education.

<sup>&</sup>lt;sup>39</sup> Kelly Rosinger et. al., "The Landscape of Performance-Based Funding in 2020," InformEd States: Higher Education Policy Initiative, January 2020,

https://static1.squarespace.com/static/5d9f9fae6a122515ee074363/t/5e3454ad239e650b8423af24/1580487858341/l S\_Brief\_LandscapeofPBF-2020.pdf.

However, the intended results of these models for student completion are not yet emerging in early evaluations of performance-based funding. 40 Many states, such as Ohio, Tennessee, and Texas, are not seeing significant increases in graduation and attainment of associate's degrees. 41 Skeptics of this growing model have asserted that while it is important to incentivize college completion instead of merely enrollment, current models are unintentionally incentivizing twoyear colleges to focus on increasing the amount of short-term certificates and credentials instead of prioritizing transfers or conferring associate degrees. 42

#### Accreditation

Accreditation within higher education is a systematic and qualitative process assessing the quality of educational institutions and programs, as well as a status provided to institutions for maintaining these quality standards. 43 Accreditors are nonprofit, private organizations that have been around since the early 1900s, and can be categorized into four groups: regional, national faith-based, national career-based, and programmatic. The first three are accreditation statuses and processes involved at the institution level, whereas programmatic accreditors pertain to specific degree programs. 44 Currently there are seven regional accreditors across the US, though only six apply to two-year and community colleges specifically, and due to recent permissions from the US Department of Education, institutions are no longer limited to seek accreditation within their own region. 45

Accreditation is an important process and status for institutions, as it is required under Title IV to receive federal and some state funding. For students, accreditation encourages confidence in the institution or program of their choice, and some states as well as certain professions may

<sup>&</sup>lt;sup>40</sup> Robert Kelchen, "Performance-Based Funding Produces Mixed Results," Education Next: Forum, 20, no. 1, (2019), https://www.educationnext.org/performance-based-funding-produces-mixed-results-forum-should-congress-linkhigher-ed-funding-graduation-rates/.

<sup>&</sup>lt;sup>41</sup> Amy Y. Li, "Lessons Learned: A Case Study of Performance Funding in Higher Education," *Third Way*, October 2018, updated January 2019, https://www.thirdway.org/report/lessons-learned-a-case-study-of-performance-fundingin-higher-education; Nicholas W. Hillman, Alisa Hicklin Fryar, and Valerie Crespín-Trujillo, "Evaluating the Impact of Performance Funding in Ohio and Tennessee," American Education Research Journal, 55, no. 1: 144-170 (2017), https://doi.org/10.3102/0002831217732951; Amy Y. Li and Alec I. Kennedy, "Performance Funding Policy Effects on Community College Outcomes: Are Short-Term Certificates on the Rise?" Community College Review, 46, no. 1: 3-39, (2018), https://doi.org/10.1177/0091552117743790.

<sup>&</sup>lt;sup>42</sup> Nicholas W. Hillman, Alisa Hicklin Fryar, Valerie Crespín-Trujillo, "Evaluating the Impact of Performance Funding in Ohio and Tennessee," American Education Research Journal, 55, no. 1: 144-170 (2017), https://doi.org/10.3102/0002831217732951.

<sup>&</sup>lt;sup>43</sup> "Accreditation & Recognition: About Accreditation," Council for Higher Education Accreditation, https://www.chea.org/about-accreditation.

<sup>&</sup>lt;sup>44</sup> Judith S. Eaton, "Accreditation and Recognition in the United States," Council for Higher Education Accreditation, November 2015, https://www.chea.org/accreditation-recognition-united-states.

<sup>&</sup>lt;sup>45</sup> Judith S. Eaton, "Will Regional Accreditation go National?," Inside Higher Ed, March 2020, https://www.insidehighered.com/views/2020/03/17/pros-and-cons-having-regional-accreditors-go-national-opinion, and "Accreditation: Postsecondary Education Institutions," U.S. Department of Education, July 2020, https://www.ed.gov/accreditation.

require individuals to attend accredited institutions or programs as a prerequisite to receiving a license to practice in their field. 46

Accreditors have developed a list of standards to which institutions are responsible for interpreting and devising missions, values, goals, and plans in order to remain accredited. 47 As accreditors allow each institution to choose their own quality indicators and metrics of student success, institutions are able to develop metrics that align with the values of their institution and generate plans that best serve their unique student body. This has the potential to be beneficial for community colleges, as they serve a wide array of missions and students.

Within regional accreditation standards, there are five main thematic areas institutions need to fulfill: governance (including mission and values), teaching and learning, institutional effectiveness (such as student success metrics and benchmarks), student services, and physical and technical resources. 48 The specific standards pertaining to these thematic areas vary between accrediting organizations. For instance, a 2018 review of accreditation standards found that only five of the seven regional accreditors require institutions to collect and report on specific student outcomes, though all request some evidence of student success—specific outcome measures institutions are required to collect for their accreditation also varies between these five accreditors. 49 The Higher Learning Commission (HLC) requires institutions to collect retention and completion rates, whereas the Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) and the Northwest Commission on Colleges and Universities (NWCCU) give colleges the flexibility to select different success metrics.<sup>50</sup>

As accreditors are increasingly prioritizing student outcomes, administrators have also increasingly prioritized corresponding metrics. Chief academic officers have reported in several surveys conducted by the National Institute for Learning Outcomes Assessment (NILOA) that regional accreditation is a primary driver of student learning outcomes assessment activity and that these outcomes are used for preparing self-studies for accreditation.<sup>51</sup>

<sup>&</sup>lt;sup>46</sup> "The Value of Accreditation," *The Council for Higher Education Accreditation*, June 2010, https://www.chea.org/sites/default/files/othercontent/Value%20of%20US%20Accreditation%2006.29.2010 buttons.pdf.

<sup>&</sup>lt;sup>47</sup> Judith S. Eaton, "Accreditation and Recognition in the United States," Council for Higher Education Accreditation, November 2015, https://www.chea.org/accreditation-recognition-united-states.

<sup>&</sup>lt;sup>48</sup> Terri Mulkins Manning, "Institutional Capacity Assessment Tool: Alignment to Accreditation," *Achieving the Dream*, August 2018, https://www.achievingthedream.org/news/16306/aligning-the-icat-to-accreditation; "Accreditation Guide: Using CCSSE & SENSE Data to Support Accreditation," Center for Community College Student Engagement, The University of Texas at Austin, 2019, https://cccse.org/sites/default/files/Accreditation\_Guide\_CCSSE2017present.pdf.

<sup>&</sup>lt;sup>49</sup> Antoinette Flores, "How College Accreditors Miss the Mark on Student Outcomes," Center for American Progress, April 2018, https://www.americanprogress.org/issues/education-postsecondary/reports/2018/04/25/449937/collegeaccreditors-miss-mark-student-outcomes/.

<sup>50</sup> Ibid.

<sup>&</sup>lt;sup>51</sup> George Kuh and Stanley Ikenberry, "More Than You Think, Less Than You We Need: Learning Outcomes Assessment in American Higher Education," National Institute for Learning Outcomes Assessment, Champaign, Illinois, October 2009, https://www.learningoutcomeassessment.org/documents/niloafullreportfinal2.pdf; Charlene Nunley, Trudy Bers, and Terri Manning, "Learning Outcomes Assessment in Community Colleges," National Institute

In order to streamline and simplify the accreditation process, many colleges default to using traditional outcome metrics to demonstrate student and institutional success as they are already being collected for federal and state reporting. In order to help institutions develop a more holistic data collection process, especially one more applicable to community college missions and student bodies, several organizations, such as Achieving the Dream (ATD) and the Center for Community College for Student Engagement (CCCSE) help institutions generate a more relevant base of evidence for determining student success. These collection efforts center student engagement and more holistic metrics to assess student and institutional success, seeking to better understand the student experience, and provide data for actionable decisionmaking. For instance, these organizations have developed resources and tools, such as ATD's Institutional Capacity Assessment Tool (ICAT) and CCCSE's surveys, to offer new and holistic ways to use data for internal decision-making and improvements, and provide guides and instructions to align these models with accreditation standards.<sup>52</sup>

#### Ranking

College rankings have historically been used both by students in selecting a college that most closely suits their needs and for institutions in benchmarking and advertising the prestige of their institution against their peers. One evident limitation to these lists is that they often do not contain or consider community colleges in equivalent ways to four-year institutions. For instance, when searching for community colleges specifically within the U.S. News & World Report website, visitors are presented with a community college directory rather than a ranked list of community colleges throughout the country as is available for four-year institutions. The directory presents profiles of accredited community colleges containing similar data and information to that within the Department of Education's College Scorecard, such as financial aid and enrollment. These media companies do provide support to prospective community college students by publishing advisory editorial content on degree selection and valuable information for specialized subgroups like international students.

The lack of ranking lists of community colleges may be due to the types of prospective students community colleges are seeking. Community colleges primarily serve those in their surrounding community, more closely mirroring the demographic make-up of their communities within their student body.<sup>53</sup> Additionally, as community colleges are open access, they do not have the same

for Learning Outcomes Assessment, Champaign, Illinois, July 2011, https://www.learningoutcomesassessment.org/documents/CommunityCollege.pdf.

<sup>&</sup>lt;sup>52</sup> Terri Mulkins Manning, "Institutional Capacity Assessment Tool: Alignment to Accreditation," Achieving the Dream, August 2018, https://www.achievingthedream.org/news/16306/aligning-the-icat-to-accreditation; "Accreditation Guide: Using CCSSE & SENSE Data to Support Accreditation," Center for Community College Student Engagement, The University of Texas at Austin, 2019, https://cccse.org/sites/default/files/Accreditation\_Guide\_CCSSE2017-

<sup>53</sup> Michelle Dimino, "How Outcomes Metrics can Better Reflect Community College Performance," Third Way. October 2019, https://www.thirdway.org/report/how-outcomes-metrics-can-better-reflect-community-collegeperformance.

selectivity metrics to report as four-year colleges. As such, rankings may not be useful to community college students, nor applicable, when deciding where to attend.

While these rankings are generally not designed for prospective community college students, the metrics that undergird the rankings do tend to be perceived as important indicators of an institution's success to students. According to a national study of opinion on postsecondary education, the majority of Americans believe that publicly available data on indicators of success such as graduation rates, drop-out rates, and post-graduation earnings are important for transparently assessing the success and efficiency of a college.<sup>54</sup> Thus, while rankings may not help students determine which community college to attend, transparent and publicly accessible metrics of institutional and student success remain highly tied to the public's perception of the efficiency and success of that college.

#### Maintaining Transparency

Under the Higher Education Act of 1965 (HEA) and the Higher Education Opportunity Act of 2008 (HEOA), colleges receiving federal student aid under Title IV must have available specific information to current and prospective students on student financial assistance programs, cost of attendance, accreditations, post-secondary employment outcomes, graduation and retention rates, and more. 55 Institutions must disclose this information publicly, such as on their website, deliver information directly to all students, or deliver information via request.<sup>56</sup> Due to the high volume of information, the National Postsecondary Education Cooperative (NPEC) developed recommendations in 2009 for how colleges can make these metrics and information available.

NPEC recommendations include developing a single webpage on an institution's website, providing hyperlinks to HEA disclosure information, adopting a "three-click" approach in which data are available three clicks away from the homepage, using consumer-friendly labels and language, and using a common set of titles to organize the information across institutions.<sup>57</sup> Two qualitative examinations conducted in 2011, one of 40 public and private two-year and four-year college websites, and the other of 152 public and private four-year college websites, found much

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<sup>&</sup>lt;sup>54</sup> Rachel Fishman, Sophie Nguyen, and Myra Francisco, "Varying Degrees 2020: New America's Fourth Annual Survey on Higher Education," New America, June 2020, https://d1y8sb8igg2f8e.cloudfront.net/documents/Varying Degrees 2020.pdf.

<sup>&</sup>lt;sup>55</sup> Andrea Sykes, "Information Required to be Disclosed Under the Higher Education Act of 1965: Suggestions for Dissemination—A Supplemental Report," U.S. Department of Education, Washington D.C., National Postsecondary Education Cooperative, November 2011, https://nces.ed.gov/pubs2012/2012831.pdf.

<sup>&</sup>lt;sup>56</sup>These disclosure requirements vary within the HEA and HEOA depending on the type of information. Kevin Carey and Andrew P. Kelly, "The Truth Behind Higher Education Disclosure Laws," Washington D.C., Education Sector and American Enterprise Institute, 2011, https://www.air.org/sites/default/files/Higher-Education-Disclosure-Laws.pdf; and Andrea Sykes, "Information Required to be Disclosed Under the Higher Education Act of 1965: Suggestions for Dissemination—A Supplemental Report," U.S. Department of Education, Washington D.C., National Postsecondary Education Cooperative, November 2011, https://nces.ed.gov/pubs2012/2012831.pdf.

<sup>&</sup>lt;sup>57</sup> Andrea Sykes, "Information Required to be Disclosed Under the Higher Education Act of 1965: Suggestions for Dissemination—A Supplemental Report," U.S. Department of Education, Washington D.C., National Postsecondary Education Cooperative, November 2011, https://nces.ed.gov/pubs2012/2012831.pdf.

variation in how colleges are providing HEA and HEOA information, despite the disclosure requirements and NPEC guidelines.58

In order to gain a more current perspective of how required information is publicly disclosed by community colleges specifically, we conducted a qualitative analysis of 75 community college websites. While each website has a unique layout of information, there is some commonality regarding the places within websites where required information is located. Many institutions are updating their webpages and data frequently, though some are missing some pieces of vital information altogether. The following are high-level findings from this analysis of community college websites:

- A third of college websites contain a "fast facts" or "about" page with quick information and data points on student demographics and course offerings. Data points include student demographics such as race/ethnicity and gender identity, metrics on enrollment intensities, student to faculty ratio, financial aid scholarships and awards, academic programs, and completion/graduation rates.
- Eighty-five percent of websites contain a central page of "Student Right to Know" or "Consumer Information," with half of these pages discoverable at the bottom of the homepage of the college's website. Within these webpages, half provide PDF versions of graduation and retention rates, whereas a third link out to their college's IPEDS College Navigator page. The remaining webpages include graduation and retention rates directly on the webpage, or provide a link to their state's institutional data platform.

While institutions are federally required to develop mechanisms for disclosing these data to students, and accreditors require data transparency as part of their standards, universal adoption of effective practices for disclosure have not yet been realized. Given the extent to which these data are missing, difficult to find, or only available upon request, it is reasonable to conclude that they are primarily—if not solely, in some cases—made available for meeting federal requirements.

#### Holistic Student Success

As documented thus far in this review of current metrics and practices, an institution's success as it relates to teaching and learning is clearly contingent on the enrollment, retention, and graduation of their student body. And, according to a recent Ithaka S+R study, increasing

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<sup>&</sup>lt;sup>58</sup> Kevin Carey and Andrew P. Kelly, "The Truth Behind Higher Education Disclosure Laws," Washington D.C., Education Sector and American Enterprise Institute, 2011, https://www.air.org/sites/default/files/Higher-Education-Disclosure-Laws.pdf; Andrea Sykes, "Information Required to be Disclosed Under the Higher Education Act of 1965: Suggestions for Dissemination—A Supplemental Report," U.S. Department of Education, Washington D.C., National Postsecondary Education Cooperative, November 2011, https://nces.ed.gov/pubs2012/2012831.pdf.

positive outcomes associated with these metrics—student retention, graduation, and course completion—is top of mind for senior academic leaders.<sup>59</sup>

Of course, these are not the only ways that one might measure the success of students and their institutions. In fact, the way that students articulate success for themselves often deviates from traditional metrics and broader institutional definitions of success. Through a recent Ithaka S+R survey and sets of interviews, students across seven community colleges defined success as more than just the attainment of a degree or credential, but in terms of the research and social skills they develop, and their sense of community, security, and accomplishment. 60 Many also remarked on the value of gaining knowledge, not just as a means to an end-that is, for application in a specific professional or educational setting-but also as having intrinsic value in and of itself. Additionally, when not restricted to providing a single motivation for attending community college, many students cite enrolling for personal interest and gaining useful career skills, in addition to earning a degree or credential. 61

There is growing but still limited awareness that conventional definitions of student success should encompass a deeper understanding of the holistic student experience, where "holistic" concerns a construct or system at its whole-in this case, the whole student. 62 For example, some researchers have defined success holistically as the "engagement in educationally purposeful activities, satisfaction, acquisition of desired knowledge, skills and competencies, persistence, attainment of educational objectives, and post college performance."63 In their Holistic Student Supports Redesign Toolkit, community college membership organization Achieving the Dream (ATD), defines student success broadly as "the outcome of personal, rigorous, and enriching learning experience that culminates in the achievement of a students' academic goals in a timely manner and fully prepares them to realize their career aspirations."64

Holistic metrics of student success have the potential to complement more traditional metrics by illuminating additional facets of the student experience that are missing from typical data collection processes. Holistic metrics should reflect students' basic needs and challenges, their well-being, engagement, and belonging within their institution. These holistic metrics can draw

<sup>&</sup>lt;sup>59</sup> Melissa Blankstein and Christine Wolff-Eisenberg, "Organizing Support for Success: Community College Academic and Student Support Ecosystems," Ithaka S+R, December 2019, https://doi.org/10.18665/sr.312259.

<sup>60</sup> Melissa Blankstein, Christine Wolff-Eisenberg, and Braddlee, "Student Needs are Academic Needs: Community College Libraries and Academic Support for Student Success," Ithaka S+R, September 2019, https://doi.org/10.18665/sr.311913.

<sup>61</sup> Laura Horn and Stephanie Nevill, "Profile of Undergraduates in U.S. Postsecondary Education Institutions: 2003-04 with a Special Analysis of Community College Students, NCES 2006-184, Washington, DC: U.S. Department of Education, National Center for Education Statistics as cited in Sara Goldrick-Rab, "Challenges and Opportunities for Improving Community College Student Success," Review of Educational Research, 80, no. 3: 437-469, https://doi.org/10.3102/0034654310370163.

<sup>62</sup> Merriam-Webster Dictionary, s.v. "Holistic."

<sup>63</sup> George D. Kuh, et. al., "What Matters to Student Success: A Review of the Literature," Washington D.C., National Postsecondary Education Cooperative, July 2006, https://nces.ed.gov/npec/pdf/Kuh Team Report.pdf.

<sup>64 &</sup>quot;Holistic Student Supports Redesign: A Toolkit for Redesigning Advising and Student Services to Effectively Support Every Student, "Achieving the Dream, October 2018.

attention to the underlying reasons why students are succeeding or not succeeding in high-level outcomes data.65

For instance, security of one's basic needs, such as food, shelter, and safety, is foundational to achieving student success as operationalized through the traditional metrics outlined in this report. If a student does not have proper nutrition or rest, or is constantly concerned with challenges outside of the classroom such as employment or caregiving, it not only can affect their grades in the short-term, but longer-term retention, time to graduation, and other barriers to completion as well. 66 Additionally, challenges with basic needs are typically interconnected and can occur simultaneously; earlier in 2020, the Hope Center for College, Community, and Justice found that six in ten community college students struggled with both food and housing insecurity.67

Greater emphasis on holistic metrics of student success therefore has the potential to be especially important to community colleges given relatively higher shares of post-traditional students that tend to face greater non-curricular challenges such as those identified above. While our website analysis did reveal that the majority of colleges are providing basic needs resources and information, discrete and actionable metrics to assess engagement with these resources, students' level of need, and engagement with their institution overall remain vital. This final section serves to document how student basic needs and other holistic metrics like engagement are currently being defined and measured.

#### Food Security

The United States Department of Agriculture (USDA) has a long-standing, validated measure of food security that has been adopted in assessing basic needs by many institutions and organizations. The USDA provides six publicly available modules of differing lengths and with multiple languages. These questions can be used to better understand the magnitude of food insecurity that students face, which is an essential first step in connecting students with relevant resources.

Food insecurity, as defined by the USDA, is "the limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways."68 The USDA measures food security on a continuum, and includes a series of

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<sup>65 &</sup>quot;Defining Student Success Data Recommendations for Changing the Conversation," Higher Learning Commission's Defining Student Success Data Initiative, December 2018, http://download.hlcommission.org/initiatives/StudentSuccessConversation.pdf.

<sup>66</sup> Katherine Broton and Sara Goldrick-Rab, "The Dark Side of College (Un)Affordability: Food and Housing Insecurity in Higher Education, Change: The Magazine of Higher Learning, 48, no. 1: 16-25, 2016, https://doi.org/10.1080/00091383.2016.1121081.

<sup>&</sup>lt;sup>67</sup> Christine Baker-Smith et. al., "#RealCollege 2020: Five Years of Evidence on Campus Basic Needs Insecurity," The Hope Center for College, Community, and Justice, February 2020 revised, https://hope4college.com/wpcontent/uploads/2020/02/2019 RealCollege Survey\_Report.pdf.

<sup>68 &</sup>quot;Measurement," United States Department of Agriculture: Economic Research Service, accessed June 2020, https://www.ers.usda.gov/topics/food-nutrition-assistance/food-security-in-the-us/measurement/#survey.

questions about participants' behaviors and experiences associated with food needs in the past 30 days or 12 months. Responses are then quantified to place participants within four specified ranges on the USDA food security continuum: high food security, marginal food security, low food security, and very low food security. Those that are placed in the low food security and very low food security ranges are considered food insecure.

- Low food security: "Reports of reduced quality, variety, or desirability of diet. Little or no indication of reduced food intake."
- Very low food security: "Reports of multiple indications of disrupted eating patterns and reduced food intake."69

There are three large-scale applications of the USDA Food Security Survey within community colleges: The Hope Center for College, Community, and Justice, Trellis Company, and the California State University (CSU) Chancellor's Office.

- The Hope Center has been examining the landscape of student food and housing insecurity via survey for the past five years using the USDA Household Food Security 18-item module. In spring 2020, the Hope Center released its fifth #RealCollege survey of 171 community colleges and 56 four-year institutions, and found that 42 percent of students at community colleges experienced food insecurity in the last 30 days.<sup>70</sup>
- Trellis Company conducted their most recent Student Financial Wellness Survey in fall 2019, which measured various financial barriers students are facing, such as debt aversion and financial knowledge, along with scales concerning food and housing insecurity. To measure students' food insecurity, they included the six-item module, and found that in the 54 community colleges who participated in the study, 23 percent of students reported low food security and 28 percent reported very low food security within the last 30 days. 71
- A large-scale study of basic needs at four-year colleges conducted by the Cal State University (CSU) Chancellor's Office assessed student food insecurity among 23 CSU campuses. Researchers used the 10-item module, and in 2016-17 found 42 percent of CSU students reported food insecurity within the last 30 days.<sup>72</sup>

<sup>69</sup> Ibid.

<sup>&</sup>lt;sup>70</sup> Christine Baker-Smith et. al., "#RealCollege 2020: Five Years of Evidence on Campus Basic Needs Insecurity," The Hope Center for College, Community, and Justice, February 2020 revised, https://hope4college.com/wpcontent/uploads/2020/02/2019\_RealCollege\_Survey\_Report.pdf.

<sup>&</sup>lt;sup>71</sup> Kasey Klepfer et. al., "Student Financial Wellness Survey: Fall 2019 Semester Results," *Trellis Company*, https://www.trelliscompany.org/wp-content/uploads/2020/07/Fall-2019-SFWS-Report.pdf.

<sup>&</sup>lt;sup>72</sup> Rashida Crutchfield and Jennifer Maguire, "Study of Student Basic Needs," The California State University, January 2018, https://www2.calstate.edu/impact-of-the-csu/student-success/basic-needsinitiative/Documents/phaseII-report-with-Appendix.pdf; Rashida Crutchfield and Jennifer Maguire, "Researching Basic Needs in Higher Education: Qualitative and Quantitative Instruments to Explore Holistic Understanding of Food and Housing Security," The California State University: Office of the Chancellor, August 2017, https://www2.calstate.edu/impact-of-the-csu/student-success/basic-needs-initiative/Documents/researching-basicneeds.pdf.

#### Housing Security and Homelessness

Unlike with food insecurity, there is currently no single standardized instrument used to assess homelessness and housing insecurity, leaving many to develop their own instrument and/or use other instruments created externally. 73 Some have developed their housing insecurity and homelessness scales based on the different definitions provided by the US Department of Housing and Urban Development (HUD) and the US Department of Education (DOE) within the McKinney-Vento Act of 1987, and questions within the US Census Bureau's Survey of Income and Program Participation (SIPP).74

HUD defines homelessness within four different categories, (1) literally homeless (i.e. an individual lacks a fixed, regular, and adequate nighttime residence), (2) imminent risk of homelessness (i.e. individual who will soon lose their primary nighttime residence), (3) homeless under other federal statues (i.e. unaccompanied youth under the age of 25 or families with children and youth), and (4) fleeing/attempting to flee domestic violence. 75 The DOE definition within the McKinney-Vento act specifically focuses on children and youth, and includes those who "lack a fixed, regular and adequate nighttime residence" as well as those who are "living in cars, parks, public spaces, abandoned buildings, or similar settings." 76

Within higher education, many instruments combine these two definitions. As the DOE definition is federally required by K-12 schools to determine housing access, as well as within stipulations for FAFSA and eligibility for work-study programs, the inclusion of this definition within basic needs assessments can be influential to track homelessness and housing insecurity longitudinally throughout a students' complete educational experience from K-12 throughout college. <sup>77</sup> Similar to food insecurity, the majority of scales measure students' housing insecurity and homelessness within the past 30 days or 12 months.<sup>78</sup>

Some organizations, like the Hope Center and Trellis Company, choose to ask students directly if they are homeless, followed by additional questions to identify living conditions that may

<sup>&</sup>lt;sup>73</sup> Rashida Crutchfield and Jennifer Maguire, "Study of Student Basic Needs," The California State University, January 2018, https://www2.calstate.edu/impact-of-the-csu/student-success/basic-needsinitiative/Documents/phaseII-report-with-Appendix.pdf.

<sup>&</sup>lt;sup>74</sup> "Survey of Income and Program Participation," *United States Census Bureau*, accessed August 2020, https://www.census.gov/programs-surveys/sipp/about.html.

<sup>&</sup>lt;sup>75</sup> "Key Federal Terms and Definitions of Homelessness Among Youth," *United States Interagency Council on* Homelessness, February 2018, https://www.usich.gov/resources/uploads/asset\_library/Federal-Definitions-of-Youth-Homelessness.pdf.

<sup>76</sup> Ibid.

<sup>&</sup>lt;sup>77</sup> Rashida Crutchfield and Jennifer Maguire, "Researching Basic Needs in Higher Education: Qualitative and Quantitative Instruments to Explore Holistic Understanding of Food and Housing Security," The California State University: Office of the Chancellor, August 2017, https://www2.calstate.edu/impact-of-the-csu/student-success/basicneeds-initiative/Documents/researching-basic-needs.pdf; Rashida Crutchfield and Jennifer Maguire, "Study of Student Basic Needs," The California State University, January 2018, https://www2.calstate.edu/impact-of-thecsu/student-success/basic-needs-initiative/Documents/phaseII-report-with-Appendix.pdf.

<sup>&</sup>lt;sup>78</sup> Christine Baker-Smith et. al., "#RealCollege 2020: Five Years of Evidence on Campus Basic Needs Insecurity," The Hope Center for College, Community, and Justice, February 2020 revised, https://hope4college.com/wpcontent/uploads/2020/02/2019\_RealCollege\_Survey\_Report.pdf.

indicate signs of housing insecurity or homelessness.<sup>79</sup> Other surveys, like the CSU Chancellor's study of basic needs, do not ask students directly if they are homeless but provide a list of housing conditions similar to the follow up questions in the Hope Center and Trellis Company surveys.80

- The Hope Center developed their own survey instrument adapted from the SIPP Adult Well-Being Module and questions used by the CSU Chancellor's Survey—assessing behaviors such as the ability to pay rent among, and their housing environments. 81 In fall 2019, they found that half of students at two-year colleges experienced housing insecurity, and about 17 percent were affected by homelessness in the last 12 months.<sup>82</sup>
- The Trellis Company assesses homelessness with a similar approach to the Hope Center. In fall 2019, they found that 49 percent of community college students reported housing insecurity, and 15 percent reported homelessness within the past 12 months.83
- The CSU instrument uses both HUD and DOE definitions to assess for homelessness with a 12-month timeframe to account for term breaks. 84 They found in 2016-17 that 11 percent of CSU students reported homelessness within the past year. 85

#### Physical & Mental Health

There are limited metrics and assessment instruments for measuring college students' physical health needs and challenges. According to the Americans with Disabilities Act of 1990 (ADA), having a disability is defined as "a physical or mental impairment that substantially limits one or more major life activities of an individual, a record of such an impairment, and being regarded

<sup>&</sup>lt;sup>79</sup> Rashida Crutchfield and Jennifer Maguire, "Researching Basic Needs in Higher Education: Qualitative and Quantitative Instruments to Explore Holistic Understanding of Food and Housing Security," The California State University: Office of the Chancellor, August 2017, https://www2.calstate.edu/impact-of-the-csu/student-success/basicneeds-initiative/Documents/researching-basic-needs.pdf.

<sup>80</sup> Rashida Crutchfield and Jennifer Maguire, "Study of Student Basic Needs," The California State University, January 2018, https://www2.calstate.edu/impact-of-the-csu/student-success/basic-needsinitiative/Documents/phaseII-report-with-Appendix.pdf.

<sup>81</sup> Sara Goldrick-Rab, Christine Baker-Smith, Vanessa Coca, and Elizabeth Looker, "Guide to Assessing Basic Needs Insecurity in Higher Education." The Hope Center for College, Community, and Justice, Fall 2019, https://hope4college.com/wp-content/uploads/2019/11/RealCollege-survey-guide-layout-FINAL.pdf.

<sup>82</sup> Christine Baker-Smith et. al., "#RealCollege 2020: Five Years of Evidence on Campus Basic Needs Insecurity," The Hope Center for College, Community, and Justice, February 2020 revised, https://hope4college.com/wpcontent/uploads/2020/02/2019\_RealCollege\_Survey\_Report.pdf.

<sup>83</sup> Kasey Klepfer et. al., "Student Financial Wellness Survey: Fall 2019 Semester Results," Trellis Company, https://www.trelliscompany.org/wp-content/uploads/2020/07/Fall-2019-SFWS-Report.pdf.

<sup>84</sup> Rashida Crutchfield and Jennifer Maguire, "Study of Student Basic Needs," The California State University, January 2018, https://www2.calstate.edu/impact-of-the-csu/student-success/basic-needsinitiative/Documents/phaseII-report-with-Appendix.pdf.

<sup>85</sup> Rashida Crutchfield and Jennifer Maguire, "Researching Basic Needs in Higher Education: Qualitative and Quantitative Instruments to Explore Holistic Understanding of Food and Housing Security," The California State University: Office of the Chancellor, August 2017, https://www2.calstate.edu/impact-of-the-csu/student-success/basicneeds-initiative/Documents/researching-basic-needs.pdf.

as having such an impairment."86 Under the ADA, colleges must make reasonable accommodations within their courses and facilities to provide every student with an equal opportunity of success.<sup>87</sup> Disability offices and mental health counseling departments provide these accommodations to students who seek support.88

Since colleges cannot force students to disclose if they have a disability, there are ways to assess the level of need within their student body using self-report assessments, such as surveys and questionnaires, as students are not required to answer every question if they do not wish to do so. Physical health questionnaires may also examine students' substance and alcohol use, sexual activity, weight, nutrition, and exercise, as well as physical safety on and off-campus.<sup>89</sup>

Students' mental health needs have become an increasing concern over the past few decades, with many colleges continually offering new and increasing amounts of counseling services on their campuses. A study of mental health treatment among US college students found that the share of students diagnosed with mental illnesses increased from 22 percent in 2007 to 36 percent in 2017, and the rate of treatment for mental health needs increased from 19 percent to 34 percent respectively. 90 As mental health concerns can lead to attrition and other challenges for student success, many college presidents and strategic plans are now prioritizing mental health needs.

The need for mental health care is especially pronounced for community colleges as students in this part of the higher education sector are apt to have more severe psychological concerns and fewer resources available to them at their college. 91 However, funding and resources for mental health services remain limited. A 2019 survey of college presidents found that although 80 percent of community college presidents are increasingly prioritizing mental health services for their students, 65 percent indicated their college does not have the tools and resources to address mental health concerns on their campus, such as professional training, assessments, or developmental tools. Over half of community college presidents have allocated more money towards mental health on their campuses, though larger shares of community college presidents

<sup>86</sup> Legal Information Institute, Cornell Law School, https://www.law.cornell.edu/uscode/text/42/12102.

<sup>87</sup> Dart Toolkit II: Legal Issues - ADA Basics, American Psychological Association, https://www.apa.org/pi/disability/dart/legal/ada-basics.

<sup>88</sup> The American with Disabilities Act and Your Rights as a College Student, Studentcaffe, http://studentcaffe.com/prepare/students-with-disabilities/ada-your-rights-college-student.

<sup>89 &</sup>quot;About ACHA-NCHA," American College Health Association, accessed August 2020, https://www.acha.org/NCHA/About\_ACHA\_NCHA/Overview/NCHA/About/About\_NCHA.aspx.

<sup>&</sup>lt;sup>90</sup> Sarah Ketchen Lipso, Emily G. Lattie, and Daniel Eisenberg, "Increased Rates of Mental Health Service Utilization by U.S. College Students: 10-Year Population-Level Trends (2007-2017)," Psychiatric Services, 70, no. 1, 60-63, https://doi.org/10.1176/appi.ps.201800332.

<sup>&</sup>lt;sup>91</sup> Daniel Seth Katz and Karen Davison, "Community College Student Mental Health: A Comparative Analysis," Community College Review, 42, no. 4, 307-326, 2014, https://doi.org/10.1177/0091552114535466.

indicated no change in allocations or devoted less funding to mental health services compared to four-year institutions.92

Defining mental health is in itself a challenge, as there can be many different impacts and factors playing a role into psychological distress. Many assessment measures exist to determine psychological distress and mental health challenges, each using validated, psychometric scales to assess different aspects of a student's mental health. For instance, a commonly used health assessment measure among colleges across the US is the National College Health Assessment III (ACHA-NCHA III) from the American College Health Association (ACHA). The survey contains seven validated measures on topics such as resilience, well-being, serious mental illness, suicidal behaviors, loneliness, food security (using the USDA six-item short form scale with a 30-day timeframe), and substance-use screening. 93 According to their 2020 results, 30 percent of students have received mental health services in the past year, with 55 percent receiving that care from their campus health or counseling center.94

The CSU Chancellor's survey uses the Center for Disease Control's (CDC) CORE Healthy Days Measure, a short, four-item questionnaire measuring a respondents' general physical and mental health, how many times their health has not been "good" in the past month, and how often these occurrences prevented them from conducting their usual activities. When using this scale, CSU define poor mental health as number of days per month of a student's self-reported stress or depression. When using this instrument, the CSC defines frequent mental and physical distress as an individual reporting 14 or more days not in "good" mental or physical health.95

Lastly, the Healthy Minds Network, which has developed and conducted the Health Minds Study annually since 2007, has three core sections including demographics, mental health status, mental health service utilization, and help-seeking modules. The study also offers elective modules focusing on other aspects of mental and physical health including substance use, sleep, sexual assault, and resilience and coping. To assess mental health statuses, the instrument uses the validated Patient Health Questionnaire nine-item (PHQ-9) scale to assess depression, the Generalized Anxiety Disorder seven-item (GAD-7) scale to assess anxiety, as well as other metrics of suicidal ideation and behaviors. Another optional module of interest relates to persistence and retention—asking about overall academic experience, experiences with faculty and academic support services, social experiences, and issues affecting academic performance.

<sup>92</sup> Hollie Chessman and Morgan Taylor, "College Student Mental Health and Well-Being: A Survey of Presidents," American Council on Education, August 2019, https://www.higheredtoday.org/2019/08/12/college-student-mentalhealth-well-survey-college-presidents/.

<sup>93 &</sup>quot;National College Health Assessment III Codebook," American College Health Association, December 2019, https://www.acha.org/documents/ncha/ACHA-NCHA-III\_Codebook\_revised\_12-11-2019.pdf.

<sup>94</sup> American College Health Association-National College Health Assessment III: Undergraduate Student Reference Group Executive Summary Spring 2020, American College Health Association, Silver Spring, MD: 2020.

<sup>95</sup> Health-Related Quality of Life (HRQOL), Centers for Disease Control and Prevention, https://www.cdc.gov/hrqol/faqs.htm#12.

#### Engagement

Student engagement has also become an increasing priority for colleges as studies show that engagement indicators can predict retention and completion for a student throughout their college experience. Student engagement can be described as the amount of intentional time and effort a student takes to involve themselves in their education and participate in beneficial practices that promote their own learning and development. 96 Studies have shown that greater engagement, particularly within the first term at college, positively predicts completion outcomes.97

One of the most prominent assessment measures in the community college space is the Community College Survey of Student Engagement (CCSSE) developed and implemented by the Center for Community College Student Engagement (CCCSE). The CCSSE instrument has been validated and administered to hundreds of colleges and hundreds of thousands of students across the US focusing on five thematic areas: active and collaborative learning, student-faculty interaction, student effort, support for learners, and academic challenges. 98 For instance, across participating institutions in 2019, the survey found that 40 percent of students typically spend one to five hours per week preparing for class, 66 percent have never used peer or other tutoring services, and 40 percent have never used a computer lab throughout the term.<sup>99</sup>

CCCSE has also developed and annually administers their Survey of Entering Student Engagement (SENSE), which helps institutions understand why students persist at their college. This instrument is typically administered a month into a student's first term at their college and asks them to reflect on their earliest academic and service-related experiences. In 2019, 46 percent of students at participating institutions strongly agreed that they learned the name of another student in most of their classes within the first three weeks, and a third of students asked for help from their instructor two to three times in their first three weeks. 100

Rising in popularity and included within VFA metrics collected are "Early Momentum Metrics" (EMM)—a level of engagement measuring the amount of credits completed within a student's first year or term at their college. 101 These metrics consider a student's accumulation of credits

<sup>&</sup>lt;sup>96</sup> George D., Kuh, "What Student Affairs Professionals Need to Know about Student Engagement," Journal of College Student Development, 50, no. 6, 683-706, 2009, https://doi.org/10.1353/csd.0.0099.

<sup>&</sup>lt;sup>97</sup> Derek V. Price and Esau Tovar, "Student Engagement and Institutional Graduation Rates: Identifying High-Impact Educational Practices for Community Colleges," Community College Journal of Research and Practice, 38, 766-782, 2014, https://doi.org/10.1080/10668926.2012.719481; Kay McClenny, C. Nathan Marti, and Courtney Adkins, "Student Engagement and Student Outcomes: Key Findings from CCSSE Validation Research," Community College Survey of Student Engagement, https://files.eric.ed.gov/fulltext/ED529076.pdf.

<sup>98</sup> Benchmark Survey Results CCSSE Respondents, The Center for Community College Student Engagement, 2020, https://www.ccsse.org/survey/national3.cfm.

<sup>99</sup> Ibid.

<sup>100</sup> Benchmark Survey Results SENSE Respondents, The Center for Community College Student Engagement, 2020, https://www.ccsse.org/sense/survey/nationalbenchmark.cfm.

<sup>&</sup>lt;sup>101</sup> Clive R. Belfield, Davis Jenkins, and John Fink, "Early Momentum Metrics: Leading Indicators for Community College Improvement," Community College Research Center, July 2019, https://ccrc.tc.columbia.edu/media/k2/attachments/early-momentum-metrics-leading-indicators.pdf.

within their first year and their persistence into their second year, and have been shown to strongly predict overall retention and completion of students at two-year and four-year colleges.<sup>102</sup> There are three different kinds of EMMs: credit-based (i.e. the number of credits completed within the first year), gateway course-based (i.e. if students complete college-level English or math courses in their first year), and persistence-momentum-based (i.e. rate that students are retained from their first to second term). 103

#### Additional Holistic Success Metrics & Student Needs

Other needs foundational to student success include transportation for commuting students, child care for students with dependents, and access to the internet and functioning technological materials for coursework and career-related activities—particularly during this time of increased remote and online learning.

#### Transportation

Transportation needs span a wide array of modalities across regions—for instance, public transportation assistance may be more useful to urban or suburban colleges, while gas vouchers, rideshare, and carpooling systems, as well as emergency funds for car repairs may be more appropriate for rural or small town settings. 104 Transportation costs, depending on location, can be prohibitively expensive: in 2019, College Board's Annual Survey for Colleges found that fulltime community college students who live off-campus spend an average \$1,840 on transportation and commuting costs. 105 Mitigating these costs may help students allocate funds towards food and housing, internet and technology, child care, tuition, or other major expenses.

Currently there are no widespread metrics or assessment instruments specifically focused on transportation challenges facing students in higher education. In their Financial Wellness Survey, Trellis Company found seven percent of community college students use public transportation regularly to get to school and 35 percent agree that their institution makes transportation more affordable. 106 However, validated methods for unpacking other aspects of transportation, such as preferred transportation modality, maintenance costs and sustainability, length of commute, and price of public transportation from different surrounding locations may

<sup>102</sup> Ibid.

<sup>103</sup> Ibid.

<sup>104</sup> lvy Love, "Varied Student Transit Needs Call for Innovative Solutions," The Association of Community College Trustees, accessed August 2020, http://perspectives.acct.org/stories/varied-student-transit-needs-call-for-innovative-

<sup>&</sup>lt;sup>105</sup> Jennifer Ma, Sandy Baum, Matea Pender, and C.J. Libassi, "Trends in College Pricing 2019," College Board, November 2019, https://research.collegeboard.org/pdf/trends-college-pricing-2019-full-report.pdf; Marva Craig, "Transportation Costs can Block Student Success at Community Colleges," The Hechinger Report, February 2019, https://hechingerreport.org/opinion-transportation-costs-can-block-student-success-at-community-college/.

<sup>106</sup> Kasey Klepfer et. al., "Student Financial Wellness Survey: Fall 2019 Semester Results," Trellis Company, https://www.trelliscompany.org/wp-content/uploads/2020/07/Fall-2019-SFWS-Report.pdf.

be helpful to better understand the circumstances of transportation needs for commuting students.

#### Child Care

About a quarter of community college students have dependents and 15 percent are single parents.<sup>107</sup> As such, child care is a necessity for a significant share of this population. A recent qualitative study of community college student parents found that many prioritize their family responsibilities and non-curricular needs in making decisions that affect their degree completion or transfer. 108

The amount of on-campus child care options at community colleges has decreased in the last two decades, and as such, being a student parent with fewer child care options makes it harder to complete courses let alone a degree program. <sup>109</sup> In 2020, Generation Hope found that nearly half of their 259 respondents felt disconnected from their college community, more than 60 percent missed between one and five or more days of class due to lack of child care, and three quarters said their financial aid office did not inform them that child care costs could be a determinant of financial awards. 110 Student parents are also more likely to encounter challenges with their basic needs. The Hope Center's 2019 survey of student basic needs found that 53 percent of student parents were food insecure within the last 30 days, and that 68 percent were housing insecure within the previous year, compared to 42 percent and 50 percent of overall community college students respectively.111

Ways to measure the magnitude of childcare needs of the student parent population can include determining how many students are currently raising dependent children, the ages of their dependents, if the student is raising their dependent alone, and how much time student parents spend per week attending to their child. Additional metrics might include a series of similar questions on other caretaking responsibilities (such as for a parent or a sibling). The CCSSE asks how many hours students spend in a typical week on providing care for dependents (either a

<sup>&</sup>lt;sup>107</sup> Nicole Lynn Lewis and Devon Haynes, "National Student-Parent Survey Results and Recommendations: Uncovering the Student-Parent Experience and Its Impacts on College Success," Generation Hope, 2020, http://supportgenerationhope.org/student-parents-report; "AACC Fast Facts 2020," American Association of Community Colleges, March 2020, https://www.aacc.nche.edu/research-trends/fast-facts/.

<sup>108</sup> Sally Peterson, "Community College Student Parents: Priorities for Persistence," Community College Journal of Research and Practice, 40, no. 5, 370-384, 2016, https://doi.org/10.1080/10668926.2015.1065210.

<sup>&</sup>lt;sup>109</sup> Nicole Lynn Lewis and Devon Haynes, "National Student-Parent Survey Results and Recommendations: Uncovering the Student-Parent Experience and Its Impacts on College Success," Generation Hope, 2020, http://supportgenerationhope.org/student-parents-report.

<sup>&</sup>lt;sup>110</sup> Ibid.

<sup>111</sup> Sara Goldrick-Rab, Carrie R. Welton, and Vanessa Coca, "Parenting While in College: Basic Needs Insecurity Among Students with Children," The Hope Center for College, Community, and Justice, May 2020, https://hope4college.com/wp-content/uploads/2020/05/2019 ParentingStudentsReport.pdf; Christine Baker-Smith et. al., "#RealCollege 2020: Five Years of Evidence on Campus Basic Needs Insecurity," The Hope Center for College, Community, and Justice, February 2020 revised, https://hope4college.com/wpcontent/uploads/2020/02/2019\_RealCollege\_Survey\_Report.pdf.

child, parent, or spouse). 112 Generation Hope also recommends tracking students' use of services on campus combined with the persistence and retention rates of these students over time. 113

#### Technology and Internet Access

Lastly, access to the internet and technology, particularly updated and fully functional technology, is vital to the student experience. Although technology does provide for greater accessibility of courses and institutional resources off-campus, this accessibility falls short if a student cannot afford a laptop or Wi-Fi, or is lacking the software or infrastructure needed for their courses. As we have seen with the global pandemic in 2020, adequate connection to Wi-Fi and functioning technology is essential for attending courses and completing coursework. In fact, many students who did not have Wi-Fi access at home and could not go to their campus library due to campus closures resorted to using their institution's Wi-Fi by sitting in their cars in parking lots. 114

One of the biggest challenges in conducting a needs assessment related to technology access relates to the mode of the assessment itself. Of course, in order to reach as many students as possible while also taking into consideration that the students in greatest need may not be able to conduct an online or virtual needs assessment, paper and phone surveys, as well as qualitative needs assessments can be implemented to include a wide array of students and circumstances.<sup>115</sup> Recruiting faculty to help students complete these needs assessments may help increase engagement with the evaluation. Currently, there are no widespread student-based technological needs assessments, but there are some lessons that can be learned from faculty technology needs assessments.

A review of needs assessment tools for faculty found eight major commonly assessed indicators of such technological needs and from this review: self-assessed skill level, technology use and integration, teacher beliefs, barriers to access, professional development resources, leadership, needs and wants, and demographics. Through this review of technological needs assessments, the author suggests asking questions regarding daily use, common barriers to access (such as lack of funds, knowledge of use, or IT support), and technological needs specific to different disciplines.116

Additionally, as part of the NCES Forum Unified Education Technology Suite, NCES recommends that students, instructional staff, administrators, and operational staff participate

<sup>&</sup>lt;sup>112</sup> The Community College Survey of Student Engagement, Community College Survey of Student Engagement, https://www.ccsse.org/aboutsurvey/docs/CCSSE\_2017\_sample.pdf.

<sup>113</sup> Ibid.

<sup>&</sup>lt;sup>114</sup> Colleen Flaherty, "Reversed: Internet Parking," *Inside Higher Ed*, May 2020, https://www.insidehighered.com/news/2020/05/08/parking-lot-wi-fi-way-life-many-students.

<sup>&</sup>lt;sup>115</sup> Erin N. O'Reilly, "Developing Technology Needs Assessments for Educational Programs: An Analysis of Eight Key Indicators," International Journal of Education and Development Using Information and Communication Technology, 12, no.1, 129-143, 2016, https://files.eric.ed.gov/fulltext/EJ1099589.pdf.

<sup>116</sup> Ibid.

in a needs assessment process, and that such assessments focus on functional needs (the activities performed using the technology), software requirements, software in the classroom, software features, and technical requirements and standards. 117 The School Technology Needs Assessment (STNA) was also developed with the goal of aiding institution-level decision-making for K-12 and higher education institutions regarding faculty technological needs. It includes questions on topics such as technology use environments, professional development, teaching and learning, impact of technology, and demographic questions. 118 Using these thematic areas as a guideline for assessing student's technological needs and challenges can be helpful, along with including questions focusing on students' differing technological and software needs for particular classes, career-searching and professional development, Wi-Fi and connection accessibility, among other needs.

# Concluding Thoughts and Next Steps

While federal and state agencies are on the right path to better include post-traditional students in measurements of success, the current landscape is still largely shaped by traditional students and metrics. Gathering baseline data on the holistic experiences and needs of community college students is an important step in amplifying the success of these students and their institutions and can help to identify and address existing equity gaps only deepened by the global pandemic this year.

Tracking holistic needs and challenges provides higher education institutions with insights on key factors that can improve or worsen traditional outcomes like graduation, transfer, and enrollment. It therefore behooves college leaders to capture these measurements not only for the purpose of connecting students with the services and resources they need in the short-term, but to ultimately impact high-level statistics related to persistence and completion. And, it behooves relevant organizations and associations to develop more comprehensive, validated mechanisms for systematically collecting these data.

The next stages of the Holistic Metrics of Student Success (HMSS) project will include interviews with institutional research directors and a national survey of provosts to better understand how traditional metrics are being collected and defined within the community college sector as well as the openness of these institutional leaders to new approaches for data collection. Subsequent reports will therefore identify specific barriers to change and focus on recommendations for action. We look forward to sharing our progress on these next steps soon.

<sup>&</sup>lt;sup>117</sup> Forum Unified Education Technology Suite, National Center for Education Statistics, accessed August 2020, https://nces.ed.gov/pubs2005/tech\_suite/part\_2.asp.

<sup>118 &</sup>quot;The School Technology Needs Assessment Interpretation Guide," The Serve Center at the University of North Carolina at Greensboro, accessed August 2020, https://eval.fi.ncsu.edu/wp-content/uploads/2013/06/STNA-Interpretation-Guide.pdf; "School Technology Needs Assessment," The Serve Center at the University of North Carolina at Greensboro, accessed August 2020, https://www.fi,ncsu.edu/wp-content/uploads/2013/05/School-Technology-Needs-Assesment-STNA.pdf.