

# Serving Racial Minority Students in STEM at Minority-Serving Community Colleges





# MSCC

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## Minority Serving Community Colleges

The Office of Community College Research and Leadership (OCCRL) was established in 1989 at the University of Illinois at Urbana-Champaign. Our primary mission is to use research and evaluation methods to improve policies and programs to enhance community college education and transition to college for diverse learners in Illinois and the United States. Projects of this office are supported by the Illinois Community College Board (ICCB), along with other state, federal, and private and not-for-profit organizations. The contents of our publications do not necessarily represent the positions or policies of our sponsors or the University of Illinois. Comments or inquiries about our publications are welcome and should be directed to [OCCRL@illinois.edu](mailto:OCCRL@illinois.edu). This document can be found on the web at: <http://ocrl.illinois.edu>. This publication was prepared pursuant to a grant from the Illinois Community College Board (ICCB Grant Number D60008).

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## Director's Statement

The landscape of higher education has great variation across colleges and universities relative to institutional type. From whether an institution is publically or privately controlled, where it is geographically located, the enrollment size, whether it is a two- or four-year institution, to the degree awarded, there is great pluralism within the postsecondary education context. The history of higher education indicates that postsecondary education was not structured to be accessible to the masses. Segmented opportunities for participation relatively occurred by gender, income, and racial lines.



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Blacks in particular were not afforded equal opportunities and routinely banned from attending most institutions of higher education, with the exception of Historically Black Colleges and Universities (HBCUs). HBCUs began to emerge prior to the American Civil War with the expressed purpose of the education of Blacks. The second Morrill Act of 1890 later required southern states (primarily) to create land grant institutions for Black students due to exclusion from existing land grant colleges. Likewise, Tribal Colleges and Universities (TCUs) originated to broaden access to quality and equal postsecondary education opportunities for American Indian students. Largely located on or close to reservations, TCUs were created during the 1960s during the civil rights era, with the first being established in 1968. Both TCUs and HBCUs have a history of inclusion, access, and providing opportunities for full participation. HBCUs and TCUs from their origins were earmarked to advance equitable outcomes for underserved racial minoritized populations. Hence, diversity, equity, and inclusion were embedded in the creation of these institutions and their respective missions. However, the structural diversity of the student body and development of other institutional types relative to student demographics, the nature, and the character of these institutions took different shapes due to community population shifts, namely areas experiencing growing numbers of residents from underrepresented racial minority groups. Consequently, colleges with a critical mass of Hispanic students, known as Hispanic-serving institutions (HSIs), and colleges with growing numbers of Asian American and Pacific Islander students (referred to as Asian American, Alaskan Native, and Pacific Islander Institutions (AANAPIs) began to arise. Each of these institutional types alongside HBCUs and TCUs are commonly referred to as minority-serving institutions (MSIs).

There are two- and four-year MSIs that greatly contribute to education of racial/ethnic minoritized students. Most MSIs are concentrated in the South and Southwest and somewhat in the Northeast/Mid-Atlantic regions. As such, little attention has been paid to the Midwest region with respect to MSIs and more specifically little to no attention paid to MSIs in the state of Illinois. Both MSIs and community colleges are the only college option for many underrepresented racial/ethnic minority students (URMs). Give the critical mass of URMs at community colleges, the two-year college sector is primed to aid in diversifying graduates in the science, technology, engineering, and mathematics (STEM) pipeline. Recognizing diversity and difference in higher education and the two-year college sector, OCCRL researchers embarked on exploring minority-serving community colleges (MSCCs) with particular attention to STEM pathways for underrepresented students of color. As OCCRL is committed to the successful transitions of diverse youth and adults in, through, and out of community colleges, it was of particular interest to understand how MSCCs are broadening participation in and fostering STEM programs of study.

## Minority-Serving Community Colleges

Roughly one-fifth of all undergraduates attend minority-serving institutions (MSIs), including large proportions of underrepresented minoritized students of color who otherwise may not enroll in post-secondary education (Aragon & Zamani, 2002; Gasman & Nguyen, 2014; Núñez, Hurtado, & Galdeano, 2015). Institutions are designated as MSIs based on either their primary mission or origin or the percentage of minoritized undergraduate students of color enrolled at the institution. In total, there are seven categories of MSIs recognized by the U. S. Department of Education (National Center for Education Statistics, 2007). Status as Historically Black Colleges and Universities or Tribal Colleges and Universities was granted legislatively as part of the Higher Education Act of 1965 and the Equity in Education Land-Grant Status Act of 1994 to institutions based on the primary mission and origin of these institutions. Status as Historically Black Colleges and Universities was designated by Congress to accredited institutions founded prior to 1964 whose primary mission was the education of African Americans. Similarly, Tribal Colleges and Universities are institutions designated by Congress that serve predominantly American Indian and Alaska Native students. Outside of Historically Black Colleges and Universities and Tribal Colleges and Universities, the definitions and titling of each designation of MSIs can vary across federal agencies, funding opportunities, and research. The remaining MSIs are designated based on the percentage of minoritized undergraduate students of color served by the institution. Generally, institutions are designated as:

- Predominantly Black institutions if at least 40% of the institution's total enrollment is African American or Black,
- Hispanic-serving institutions if at least 25% of the institution's total enrollment is Hispanic or Latino/a,
- Asian American, Native American, Pacific Islander-serving institutions if at least 10% of total enrollment falls in those categories, and
- Alaskan Native and/or Native Hawaiian-serving institutions if at least 20% of the institution's total enrollment falls in those categories (Center for Minority Serving Institutions, n.d.a).

Institutions not otherwise categorized, but whose combined enrollment of minoritized undergraduates exceeds 50%, are sometimes referred to as other minority-serving institutions (National Center for Education Statistics, 2007).

Approximately 46% of MSIs are two-year institutions or minority-serving community colleges (MSCCs) (American Association of Community Colleges, 2016). The number of MSCCs is ever evolving as the body of students enrolled at these institutions changes over time. As of 2016, 22% of all two-year institutions were MSCCs (Center for Minority Serving Institutions, n.d.b). This includes 321 community colleges, 15 private and 306 public, that were federally designated MSIs (Center for Minority Serving Institutions, n.d.b). These institutions overwhelmingly serve as the primary pathway into postsecondary education for historically underrepresented and underserved students, particularly minoritized students of color (Hagedorn, Chi, Cepeda, & McLain, 2007).

### The Minority-Serving Community Colleges Study

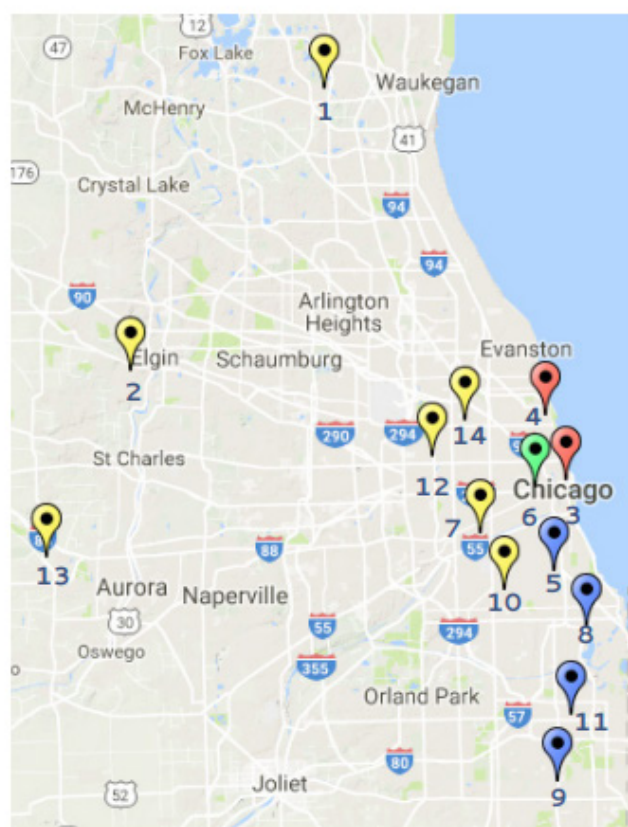
OCCRL is conducting an exploratory study examining factors that influence student success in STEM (matriculation in courses required of most STEM majors) at public community colleges that are federally designated MSIs. The goal of this project is to bridge research and practice to strengthen student outcomes in STEM programs of study at MSCCs. Through this study we are endeavoring to discern the following:





1. What are the commonly employed structures, support services, and instructional strategies currently implemented in STEM programming at Illinois MSCCs?
2. What are MSCC students' plans to matriculate from community college STEM pathways, and how does their engagement with MSCC programs, structures, and instructional strategies contribute to their plans?

3. How does students' knowledge of an institution's MSI status, or lack thereof, shape how they navigate STEM pathways (course completion and transfer), if at all?

This report reflects an initial phase of this work, including an environmental scan of MSCCs in Illinois and survey of STEM faculty at MSCCs, both designed to provide context for this work and to shed light on our first research question. The research team has three goals for this study. First, we want to build understanding of the MSCC context in the Midwest. Second, we hope to inform MSCCs on transfer patterns and best practices for fostering STEM pathways to completion within and across community college institutional types in Illinois. Third, we want to illuminate best practices for fostering underrepresented minoritized students' persistence in STEM and create transfer-supporting environments at MSCCs.

This report reflects the first phase of this study, which explores the landscape of MSCCs in Illinois and starts to address the study's first research question. This phase of the study utilizes both publicly available secondary data and survey data collected from faculty in STEM fields at MSCCs in Illinois. First, the research team developed a landscape of MSCCs in Illinois, including the communities these institutions are situated in, the populations of students served, and other key characteristics of these institutions. This landscape contrasts the contributions of Illinois MSCCs to community colleges in the state without an MSI designation. The landscape of Illinois MSCCs was developed through secondary data analysis of statewide data provided by the Illinois Community College Board; neighborhood data from City-Data.com; and enrollment, demographic, staffing, and financial aid data for Illinois Colleges from the National Center for Educational Statistics. This data was analyzed using Excel and SPSS 24.



-  *Hispanic-serving institution*
-  *Hispanic-serving institution and predominantly Black institution*
-  *Predominantly Black institution*
-  *Asian American, Native American, Pacific Islander-serving institution and Hispanic-serving institution*

1. College of Lake County
2. Elgin Community College
3. Harold Washington College
4. Harry S Truman College
5. Kennedy-King College
6. Malcolm X College
7. Morton College
8. Olive-Harvey College
9. Prairie State College
10. Richard J Daley College
11. South Suburban College
12. Triton College
13. Waubonsee Community College
14. Wilbur Wright College



**MSCC**

Minority Serving Community Colleges

Figure 1. Illinois Minority-Serving Community Colleges

Second, the research team surveyed STEM faculty at Illinois MSCCs to develop an understanding of the instructional, engagement, and advising practices of these faculty. This survey provides insight into the demographics of STEM faculty and their perceptions about the benefits and challenges of working at an MSCC. The survey was developed based on existing literature on culturally relevant pedagogical practices, student advising practices, and supporting student transfer. The survey included questions on faculty demographics, instructional strategies, student interactions, advising practices, and perceptions of teaching at an MSCC. In total, there were 46 questions asked, including 33 Likert-like questions, 7 multiple choice questions, and 6 open-ended questions. A total of 254 STEM faculty at MSCCs were identified through audits of the websites of Illinois MSCCs and invited to participate in the survey. Faculty were provided two opportunities to participate through September – October 2016 and in January of 2017. Multiple invitations were sent to non-responders in each round, resulting in 60 full-time faculty and 39 part-time faculty who completed the survey, for an overall response rate of 39%.

## Landscape of MSCCs in Illinois

Within the Midwest region, the State of Illinois has the largest number of MSCCs. There are 14 MSCCs in Illinois: ten that are Hispanic-serving institutions, five that are predominantly Black institutions, and two that are Asian American, Native American, and Pacific Islander-serving institutions. Figure 1 provides a map of the MSCCs in Illinois by MSI type. Most of the Illinois MSCCs are located within 30 miles of downtown Chicago, with the exception of College of Lake County, Elgin Community College, and Waubesa Community College. These three campuses are all about an hour drive from downtown Chicago (43–58 miles).

The MSI institutional types of MSCCs in Illinois are clustered, with the five predominantly Black institutions being located in central and southern Chicago regions and both Asian American, Native American, and Pacific Islander serving institutions located in northeastern Chicago regions. Half of the state's MSCCs are part of the City Colleges of Chicago. Each City Colleges of Chicago college focuses on one or more industry areas:

- Harold Washington College: business, entrepreneurship, and professional services;
- Harry S Truman College: education, human sciences, and natural sciences;
- Kennedy-King College: culinary arts and hospitality;
- Malcolm X College: healthcare;
- Olive-Harvey College: transportation, distribution, and logistics;
- Richard J. Daley College: advanced manufacturing; and
- Wilbur Wright College: technology (City Colleges of Chicago, 2017).

It is also important to note that most of the Illinois MSCCs have one or more satellites or campus locations. This is true of all the MSCCs that are part of City Colleges of Chicago, with the exception of Harold Washington College. While Illinois MSCCs are clustered in primarily urban regions there is notable variation in the neighborhoods served, students enrolled, and institutional focus. One indicator of the different contexts that Illinois MSCCs operate in is shown by comparing the composition of educational credentials held by the adults in the community. Figure 2 shows the educational composition for 12 of the 14 Illinois MSCCs. Morton College and Elgin Community College were excluded, as comparable data was not available. Among the neighborhoods served by Illinois MSCCs, the percentage of the adult population that has less than a high school diploma ranges from 5% to 46%. Similarly, the percentage of the neighborhood population that has an associate degree or higher ranges from 22% to 61% (City-Data, 2017).

Illinois MSCCs employ 25% of the full-time community college faculty in the state (Illinois Community College Board, 2017). Overall Illinois MSCCs rely on a higher percentage of part-time faculty, with 76% of their faculty being part-time, compared to 70% at Illinois non-MSCCs (Illinois Community College Board, 2017). However, the range in the percentage of part-time faculty at Illinois non-MSCCs ranges from 47% to 94%, whereas the range at Illinois MSCCs is much smaller at 62% to 87%. As such the reli-

ance on part-time faculty appears more reflective of the structures of the individual institutions than of the presence or absence of an MSI designation.

While the tuition and fees charged to attend any of the City Colleges of Chicago are consistent, the median incomes served across these and other Illinois MSCCs are not. Table 1 provides a listing of in-district, in-state, and out-of-state tuition and fees for each of the Illinois MSCCs. In the 2015–2016 academic year, the in-district tuition and fees ranged from \$2,832 to \$4,583 (National Center for Education Statistics, 2016). The mean in-district tuition and fees was \$3,529, with each of the City Colleges of Chicago charging \$3,505. Figure 3 shows the distribution of annual median household income across the neighborhoods served by Illinois MSCCs, which ranged from \$22,633 to \$107,200 with a mean of \$59,006 (City-Data, 2017). The neighborhood served by Waubonsee Community College has the highest median income, the lowest percentage of adults without a high school diploma, and the lowest tuition and fees among the neighborhoods served by Illinois MSCCs. In contrast, in the neighborhood served by Kennedy–King College, where the median income is 62% of the mean and 43% of adults do not have a high school diploma, the tuition is just \$29 below the mean charged by Illinois MSCCs.

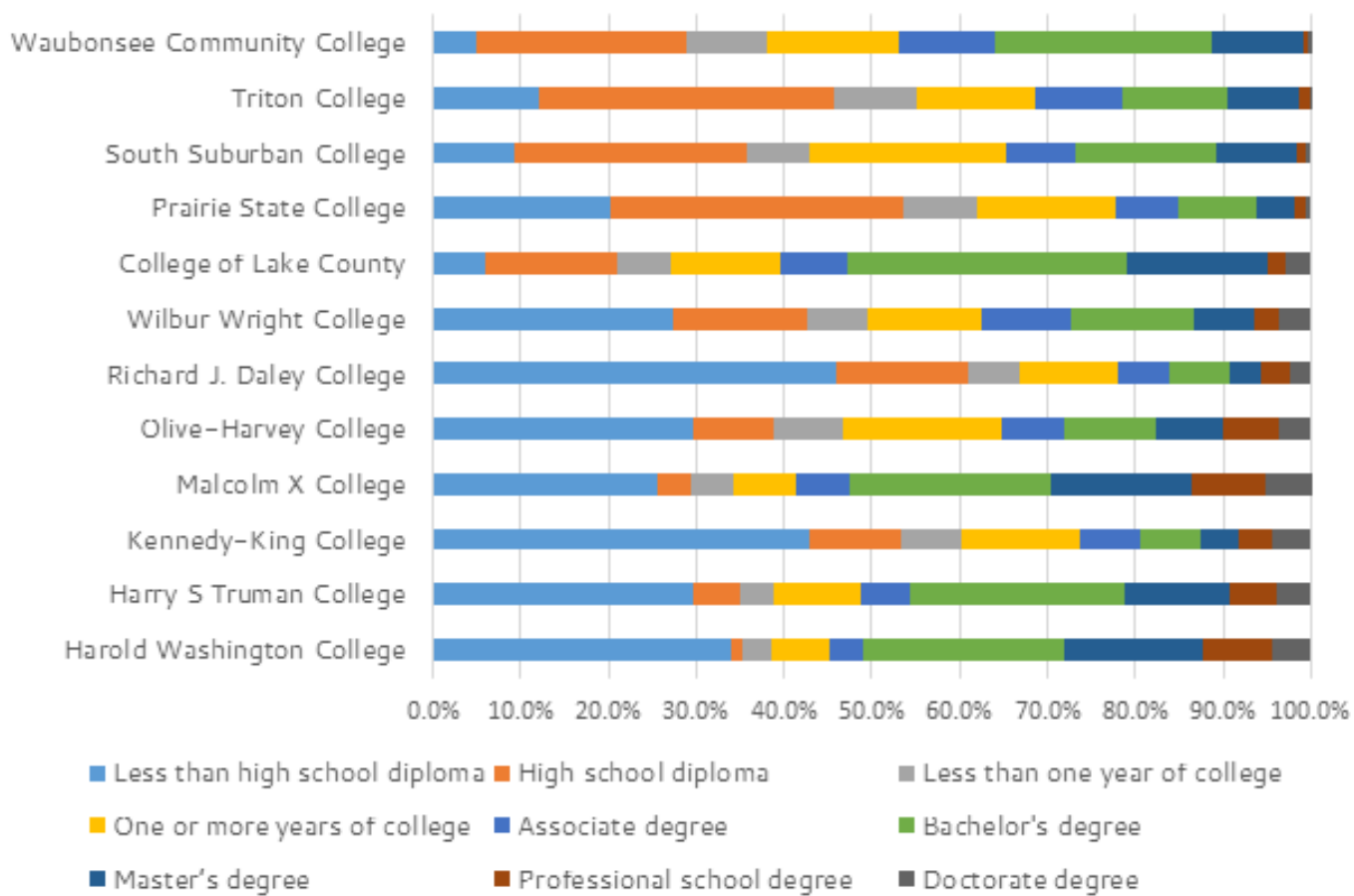
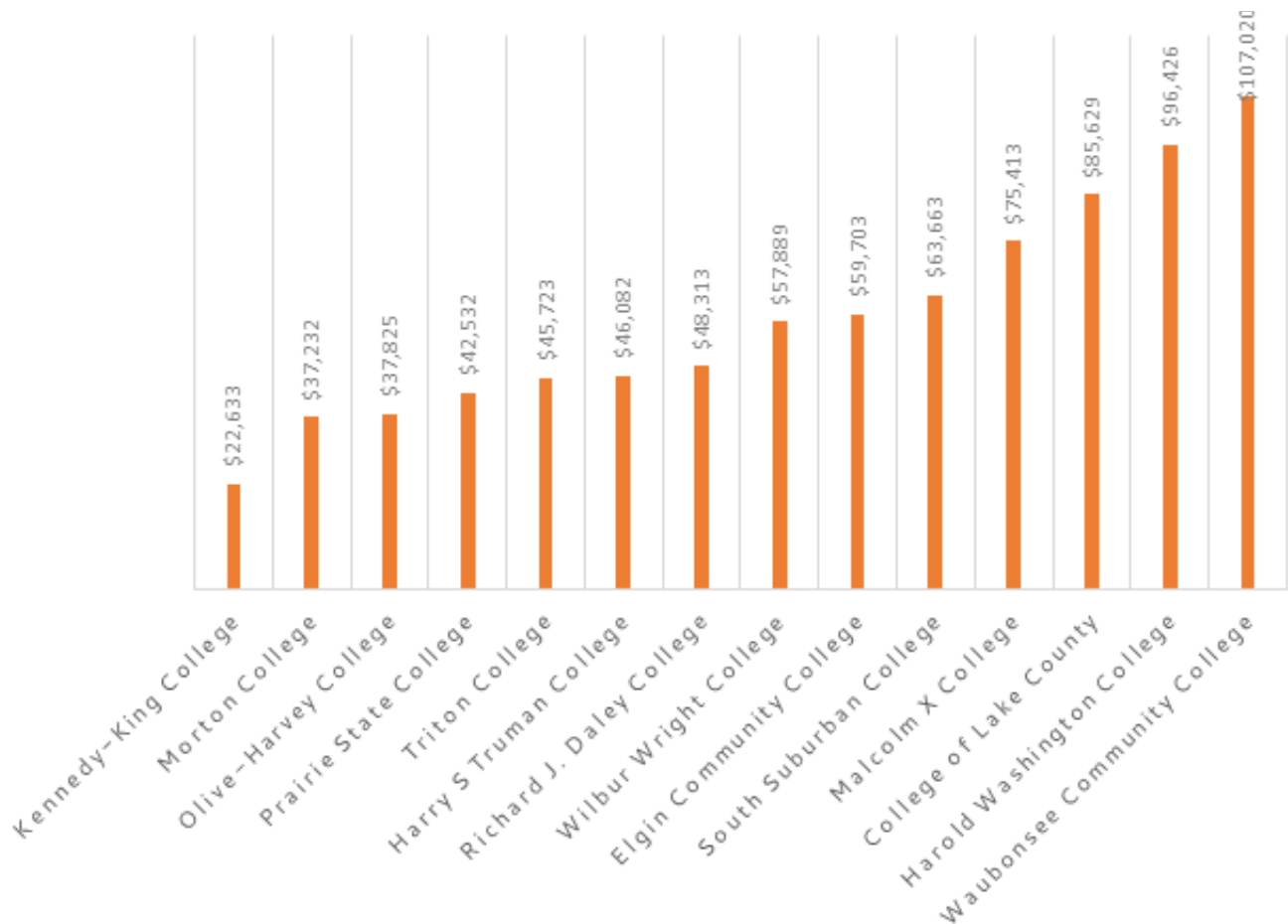


Figure 2. Highest Educational Attainment of Adults in Communities Served by Minority-Serving Community Colleges in Illinois

**Table 1. Tuition and Fees at Minority-Serving Community Colleges in Illinois, 2015–2016 Academic Year**

College	In-district tuition and fees	In-state tuition and fees	Out-of-state tuition and fees
College of Lake County	\$3,612	\$8,358	\$11,046
Elgin Community College	\$2,868	\$10,439	\$11,959
Harold Washington College	\$3,506	\$8,126	\$11,906
Harry S Truman College	\$3,506	\$8,126	\$11,906
Kennedy-King College	\$3,506	\$8,126	\$11,906
Malcolm X College	\$3,506	\$8,126	\$11,906
Morton College	\$3,668	\$7,764	\$9,812
Olive-Harvey College	\$3,506	\$8,126	\$11,906
Prairie State College	\$3,432	\$7,800	\$9,240
Richard J. Daley College	\$3,506	\$8,126	\$11,906
South Suburban College	\$4,583	\$10,786	\$12,173
Triton College	\$3,870	\$9,360	\$11,630
Waubonsee Community College	\$2,832	\$7,002	\$7,587
Wilbur Wright College	\$3,506	\$8,126	\$11,906

Data source. National Center for Education Statistics, 2016



*Figure 3. Annual Median Household Income in Illinois Communities Served by Minority-Serving Community Colleges*



## Enrollment and Completion at Illinois MSCCs

In the 2015–2016 academic year, Illinois MSCCs enrolled 32% of the community college students in the state and a high percentage of the underserved minoritized students (Illinois Community College Board, 2017). Specifically, they enrolled 62% of Latina/o students, 55% of African American students, and 44% of Nonresident Alien students enrolled across the state of Illinois (Illinois Community College Board, 2017). Table 2 outlines the demographic composition of Illinois MSCCs and Illinois non-MSCCs in the 2015–2016 academic year. Collectively, there were notably higher percentages of Black and Latina/o students enrolled at Illinois MSCCs. In contrast, while 66% of the students enrolled at Illinois non-MSCCs were White, only 24% of those enrolled at Illinois MSCCs were White (Illinois Community College Board, 2017).

**Table 2. Demographics of Students Enrolled at Illinois Minority-Serving Community Colleges (MSCCs) and non-MSCCs, 2015–2016 Academic Year**

Race / Ethnicity	Illinois MSCCs	Illinois non-MSCCs
African American / Black	22%	9%
American Indian / Native American	<1%	<1%
Asian American	4%	4%
Hispanic / Latino	37%	11%
Pacific Islander / Native Hawaiian	<1%	<1%
Nonresident Alien	1%	<1%
White	24%	66%
Other / Unknown	10%	8%

Data source. Illinois Community College Board, 2017

Half or more of students at four Illinois MSCCs received Pell grants for the 2015–2016 academic year, with a range across Illinois MSCCs from 20% to 59% (National Center for Education Statistics, 2016). Table 3 shows the percentage of students at each Illinois MSCC institution who received grants or scholarships, Pell grants, or federal student loans. The highest percentage of students with Pell grants was 59% at Kennedy–King College. The percentage of students receiving grants or scholarships at each institution is closely reflective of the percentage receiving Pell grants, typically within a 5% difference. The exception here is South Suburban College, where 50% of the students received Pell grants and 59% received grants or scholarships. South Suburban College also reported that none of their students received federal student loans.

Enrollment patterns across program classifications are substantially varied between Illinois MSCCs and Illinois non-MSCCs. Table 4 shows the percentage of students of each classification type served by each institutional type during the 2015–2016 academic year. While Illinois MSCCs enrolled 32% of the community college students in the state, they served 68% of adult basic education students, 63% of English as a second language students, and only 7% of vocational students (Illinois Community College Board, 2017). This showcases how, in Illinois, MSCCs provide a conduit to postsecondary education for substantial groups of underserved students needing educational and language learning supports in preparation for further education or employment.

**Table 3. Percent of Students Receiving Financial Aid at Minority-Serving Community Colleges in Illinois, 2015–2016 Academic Year**

College	Grants or scholarships	Pell grants	Federal student loans
College of Lake County	23%	20%	4%
Elgin Community College	31%	26%	8%
Harold Washington College	52%	51%	28%
Harry S Truman College	25%	24%	13%
Kennedy–King College	59%	59%	37%
Malcolm X College	55%	55%	27%
Morton College	40%	39%	3%
Olive–Harvey College	41%	41%	41%
Prairie State College	52%	47%	21%
Richard J. Daley College	28%	28%	12%
South Suburban College	59%	50%	0%
Triton College	33%	28%	5%
Waubensee Community College	33%	26%	11%
Wilbur Wright College	37%	37%	19%

Data source. National Center for Education Statistics, 2016

**Table 4. Enrollment by Program Classification in Illinois Minority-Serving Community Colleges (MSCCs) and non-MSCCs, 2015–2016 Academic Year**

Program classification	Illinois MSCCs	Illinois non-MSCCs
Transfer	33%	67%
Vocational	7%	93%
Career and technical	23%	77%
Adult basic education	68%	32%
Adult secondary education	38%	62%
English as a second language	63%	37%
General studies	24%	76%
<b>Total</b>	<b>32%</b>	<b>68%</b>

Data source. Illinois Community College Board, 2017

Despite supporting high numbers of students with their secondary completion, language learning, and developmental coursework, Illinois MSCCs' rates of completion reflect the proportion of the student body enrolled at these institutions. Table 5 shows the distribution of awarded associate degrees, long-term certificates, and short-term certificates at Illinois MSCCs and non-MSCCs. In 2015–2016, Illinois community colleges conferred 35,472 associate degrees, 31% of which were awarded by Illinois MSCCs (Illinois Community College Board, 2017). However, while the overall percentage of credentials at each level, including associate degrees, long-term certificates, and short-term certificates, is reflective of the proportion of students enrolled at Illinois MSCCs, there are variations in the types of associate degrees awarded. Illinois MSCCs awarded 37% of the Associate of Arts degrees, 11% of the Associate of Arts degrees in teaching, and none of the 585 Associate of Arts and Sciences degrees awarded in the state (Illinois Community College Board, 2017).

**Table 5. Degrees and Certificates Awarded by Illinois Minority-Serving Community Colleges (MSCCs) and non-MSCCs, 2015–2016 Academic Year**

Credential	Illinois MSCCs	Illinois non-MSCCs
Associate degrees	31%	69%
Certificate 1+ year	28%	72%
Certificate < 1 year	32%	68%
Total	31%	70%

Data source. Illinois Community College Board, 2017

### Illinois MSCC Profiles

In Illinois, there are 20 private and public two- and four-year MSIs, 14 of which are publicly controlled MSCCs. These MSCCs are the primary pathway into postsecondary education for historically underrepresented and underserved students, particularly underrepresented racial minority students. The following provide brief profiles of each the 14 Illinois MSCCs.

#### College of Lake County: Hispanic-Serving Institution

Founded in 1968, College of Lake County (CLC) first opened its doors in 1969 to 2,360 students (College of Lake County, 2017). In the 2015–2016 academic year, CLC enrolled 24,952 students across three campuses. CLC's student body is primarily White (46%) or Latina/o (34%), but CLC does enroll a diverse body of students (Illinois Community College Board, 2017). CLC offers a variety of associate degrees in arts, sciences, fine arts, and engineering, as well as career education degrees and certificates. In 2016, CLC conferred more than 900 certificates in health professions and related programs and over 400 certificates in mechanic and repair technologies/technicians programs (National Center for Education Statistics, 2016). CLC also awarded over 850 associate degrees in liberal arts and sciences, general studies, and humanities, along with multi/interdisciplinary studies and health professions and related programs (National Center for Education Statistics, 2016).

#### Elgin Community College: Hispanic-Serving Institution

Founded in 1949, Elgin Community College (ECC) began as a junior college, holding classes out of Elgin High School (Elgin Community College, 2017). ECC services District 509 (one of the 39 community college districts in Illinois), which covers 360 square miles. In the 2015–2016 academic year, ECC enrolled 16,114 students, of whom the majority were White (44%) or Latino/a (Illinois Community College Board, 2017). ECC offers a variety of associate degree programs in the arts, sciences, engineering, fine arts, and liberal studies, along with transfer programs and adult education. During the 2015–2016 academic year, ECC awarded approximately 320 certificates in mechanic and repair technologies programs and over 350 certificates in health professions and related programs (National Center for Education Statistics, 2016). ECC also awarded 545 associate degrees in liberal arts and sciences, general studies, and humanities and 256 associate degrees in biological and physical sciences (National Center for Education Statistics, 2016).

#### Harold Washington College, City Colleges of Chicago: Asian American, Native American, Pacific Islander-Serving Institution and Hispanic-Serving Institution

Founded in 1962 as Loop Junior College, Harold Washington College (HWC) is the third-oldest community college in the City Colleges of Chicago system. It was renamed in 1987 after the passing of Chicago's first African-American mayor, Harold Washington (City Colleges of Chicago, 2017). In the 2015–2016 academic year, HWC enrolled almost 14,000 students, the majority of whom were African American (31%) or Latina/o (39%) (Illinois Community College Board, 2017). Located in the Loop area of Chicago, HWC serves as a hub for business education, partnering with businesses such as Deloitte, Accenture, and Randstad (City Colleges of Chicago, 2017). In 2016, HWC awarded 87 certificates in business, management, marketing, and related support services and almost 870 associate degrees in liberal arts and sciences, general studies, and humanities (National Center for Education Statistics, 2016).

HWC offers college-to-career pathways in the areas of insurance and banking, accounting, marketing and management, and business and economics. HWC is also the Chicago home for the Goldman Sachs 10,000 Small Businesses program (City Colleges of Chicago, 2017).

### **Harry S Truman College, City Colleges of Chicago: Asian American, Native American, Pacific Islander–Serving Institution and Hispanic–Serving Institution**

Founded in 1956, Harry S Truman College (HSTC) began as an “evening college,” offering classes out of a local high school. Outgrowing its initial location, HSTC, then known as Mayfair College, relocated to its current location. It was renamed in 1976 after the 33rd president of the United States (City Colleges of Chicago, 2017). In the 2015–2016 academic year, HSTC enrolled approximately 15,850 students, the majority of whom were African American (21%) or Latina/o (42%) (Illinois Community College Board, 2017). Located in the Uptown neighborhood, HSTC offers courses in education and human and natural sciences. In 2016, HSTC conferred certificates in the areas of family and consumer sciences/human services and health professions and related programs and awarded associate degrees in health professions and related programs, multi/interdisciplinary studies, liberal arts and sciences, general studies, and humanities (National Center for Education Statistics, 2016). HSTC is the home of Truman Middle College, an alternative high school for students who dropped out of high school but wish to obtain a high school diploma.

### **Kennedy–King College, City Colleges of Chicago: Predominantly Black Institution**

Founded in 1935 as Woodrow Wilson Junior College, Kennedy–King College (KKC) is one of seven community colleges that make up the City Colleges of Chicago. Renamed in 1969 in honor of Robert F. Kennedy and Martin Luther King, Jr., KKC is the smallest of the City Colleges of Chicago colleges (City Colleges of Chicago, 2017). In the 2015–2016 academic year, KKC enrolled approximately 6,900 students, the majority of whom were African American (84%) (Illinois Community College Board, 2017). Nestled in the Englewood area, KKC serves as a hub for hospitality and culinary arts education, offering courses at the Washburne Culinary and Hospitality Institute. In 2016, KKC conferred almost 250 certificates in personal and culinary services programs and 263 associate degrees in liberal arts and sciences, general studies, and humanities (National Center for Education Statistics, 2016). KKC is also home to WXCC PBS Chicago, WKCC 89.3FM Radio, the Center for Distance Learning, and the Child Development Laboratory Center (City Colleges of Chicago, 2017).

### **Malcolm X College, City Colleges of Chicago: Hispanic–Serving Institution and Predominantly Black Institution**

Founded in 1911 as Crane Junior College, Malcolm X College (MXC) is the oldest of the seven City Colleges of Chicago community colleges. Known as Herzl Junior College from 1932 to 1969, the institution served as a U.S. Navy training college in 1944–1945 (City Colleges of Chicago, 2017). In the 2015–2016 academic year, MXC enrolled approximately 9,500 students, the majority of whom were African American (55%) or Latina/o (31%) (Illinois Community College Board, 2017). MXC serves as a hub for healthcare education, offering the largest selection of health sciences degrees in Cook County. In 2016, MXC conferred over 600 certificates in health professions and related programs and conferred associate degrees primarily in the areas of multi/interdisciplinary studies, liberal arts and sciences, general studies, and humanities (National Center for Education Statistics, 2016). MXC recently opened a new School of Health Sciences, which houses a virtual hospital and the City Colleges of Chicago School of Nursing (City Colleges of Chicago, 2017).

### **Morton College: Hispanic–Serving Institution**

Founded in 1924, Morton College (MC) is the second–oldest community college in Illinois (Morton College, 2017). Originally located at Morton East High School, Morton College initially had 11 teachers and 76 students (Morton College, 2017). In the 2015–2016 academic year, MC enrolled 6,942 students, of whom the majority (84%) were Latina/o (Illinois Community College Board, 2017). MC offers a variety of concentrations in an Associate of Applied Science degree along with a host of certificate programs. During the 2015–2016 academic year, most of the certificates awarded by MC were in the areas of business management, marketing, and related support services programs, and child care provider/assis-

tant programs (National Center for Education Statistics, 2016). Additionally, MC conferred 122 associate degrees in the areas of biological and physical sciences and 182 associate degrees in liberal arts and sciences, general studies, and humanities (National Center for Education Statistics, 2016). In 2007, the Hawthorne Works Museum and Heritage Hall opened, honoring MC's history in the community (Morton College, 2017).

### **Olive-Harvey College, City Colleges of Chicago: Predominantly Black Institution**

Founded in 1950, Olive-Harvey College (OHC) began as two colleges, Fenger and Southeast Junior Colleges. In 1970, the two colleges merged and were renamed Olive-Harvey College (OHC) in honor of PFC Milton Lee Olive III and Carmel Bernon Harvey, Jr., two Chicago men who lost their lives in the Vietnam War (City Colleges of Chicago, 2017). Located in the Pullman neighborhood, OHC has the largest campus of the City Colleges of Chicago community colleges. In the 2015-2016 academic year, OHC enrolled 7,479 students, the majority of whom were African American (62%) or Latina/o (22%) (City Colleges of Chicago, 2017; Illinois Community College Board, 2017). During the 2015-2016 year, OHC awarded 1,627 certificates in transportation and materials moving programs and almost 300 associate degrees in liberal arts and sciences, general studies, and humanities. OHC serves as a hub for transportation, distribution, and logistics programs (National Center for Education Statistics, 2016).

### **Prairie State College: Predominantly Black Institution**

Founded in 1957 as Bloom Township Junior College, the college was renamed in the late 1960s as Prairie State College (PSC). The first Illinois community college to guarantee the transferability of their courses to other Illinois institutions, PSC serves the Chicago Heights area (Prairie State College, 2017). In the 2015-2016 academic year, PSC enrolled 9,818 students, 56% of whom were African American (Illinois Community College Board, 2017). PSC offers degrees and certificates in over 100 fields of study, along with continuing education courses (Prairie State College, 2017). In 2016, PSC conferred more than 250 certificates in health professions and related programs and over 190 associate degrees in liberal arts and sciences, general studies, and humanities (National Center for Education Statistics, 2016).

### **Richard J. Daley College, City Colleges of Chicago: Hispanic-Serving Institution**

Founded in 1960 as William J. Bogan Junior College, Richard J. Daley College (RJDC) is the third-largest community college in the City Colleges of Chicago. In 1970, the college was renamed to Southwest College, and in 1981 it was renamed again as RJDC to honor the passing of former mayor Richard J. Daley (City Colleges of Chicago, 2017). RJDC is a Hispanic-serving institution located in the West Lawn neighborhood of Chicago. In the 2015-2016 academic year, RJDC enrolled 14,263 students (Illinois Community College Board, 2017). RJDC serves as a hub for advanced manufacturing programs. In 2016, RJDC awarded over 500 certificates in construction trades programs and approximately 352 associate degrees in liberal arts and sciences, general studies, and humanities. RJDC offers advanced manufacturing certificates and degrees in computerized numerical control machining and factory automation (National Center for Education Statistics, 2016).

### **South Suburban College: Predominantly Black Institution**

Founded in 1927 as Thornton Junior College, South Suburban College (SSC) initially began as an extension of Thornton Township High School (South Suburban College, 2017). In 1969, the institution was renamed to Thornton Community College, followed by its current name in 1988, to reflect the geographic location of the college (South Suburban College, 2017). SSC serves the south suburbs of Chicago, also called Chicago Southland. In the 2015-2016 academic year, SSC enrolled 9,770 students, of whom the majority were African American (58%) or Latina/o (18%) (Illinois Community College Board, 2017). SSC offers a variety of degrees and certificates while providing adult basic education and other community programs. During the 2015-2016 academic year, SSC conferred more than 130 certificates in the areas of business, management, marketing, and related support services programs and health professions and related programs (National Center for Education Statistics, 2016). SSC also awarded more than 200 associate degrees in the areas of multi/interdisciplinary studies, liberal arts and sciences, general studies, and humanities (National Center for Education Statistics, 2016).

## Triton College: Hispanic–Serving Institution

Founded in 1964, Triton College (TC) was named after three high school districts: Elmwood Park, Leyden, and Proviso Township. Located in the western suburbs, TC enrolled 17,832 students during the 2015–2016 academic year (Illinois Community College Board, 2017). TC serves a diverse student body that is 37% Latina/o, 29% White, and 15% African American (Illinois Community College Board, 2017). TC offers certificates and degrees in over 100 areas of study, provides a real estate academy, and provides concealed carry handgun training (Triton College, 2017). During the 2015–2016 academic year, TC awarded more than 200 certificates in the health professions and related programs field, along with over 600 associate degrees in the fields of multi/interdisciplinary studies, health professions and related programs, liberal arts and sciences, general studies, and humanities (National Center for Education Statistics, 2016). Triton College is home for the Cernan Earth and Space Center Star Store (Triton College, 2017).

## Waubonsee Community College: Hispanic–Serving Institution

Founded in 1966, Waubonsee Community College (WCC) was initially named Fox Valley Community College (Waubonsee Community College, 2017). WCC's current name is the result of a district-wide naming contest and comes from the name of a Pottawatomie Native American chief who resided in the area during the 1800s (Waubonsee Community College, 2017). WCC serves the Sugar Grove area and is a founding member of the Illinois Virtual Campus (Waubonsee Community College, 2017). In the 2015–2016 academic year, WCC enrolled 18,931 students, of whom 47% were White and 37% were Latina/o (Illinois Community College Board, 2017). WCC offers a variety of degrees and certificates, along with career programming. During the 2015–2016 academic year, WCC awarded over 300 certificates in health professions and related programs and over 100 certificates in mechanic and repair technologies programs (National Center for Education Statistics, 2016). WCC also awarded over 500 associate degrees in multi/interdisciplinary studies and 278 associate degrees in liberal arts and sciences, general studies, and humanities (National Center for Education Statistics, 2016).

## Wilbur Wright College, City Colleges of Chicago: Hispanic–Serving Institution

Established in 1934, Wilbur Wright Junior College, now Wilbur Wright College (Wilbur), was named to honor the death of Wilbur Wright (City Colleges of Chicago, 2017). Wilbur is the second-oldest community college in the City Colleges of Chicago system (City Colleges of Chicago, 2017). In the 2015–2016 academic year, Wilbur enrolled approximately 17,300 students, the majority of whom were Latina/o (59%) (Illinois Community College Board, 2017). Serving the Dunning neighborhood of Chicago, Wilbur serves as a hub for information technology programs. WWC offers information technology associate degrees in networking & technology, web development, and computer science. In 2014, WWC reached a milestone by conferring 1,031 associate degrees (City Colleges of Chicago, 2017). This marked the first time in Wilbur's history that more than 1,000 of their students earned an associate degree (City Colleges of Chicago, 2017). In 2016, Wilbur conferred almost 170 certificates in health professions and related programs and 705 associate degrees in liberal arts and sciences, general studies, and humanities (National Center for Education Statistics, 2016).

## STEM MSCC Faculty Survey

A total of 754 STEM faculty at MSCCs in Illinois were identified via reviews of the institutions' websites. Survey responses were collected through two rounds of invitations sent in September/October of 2016 and January 2017. Over the course of this time, each potential participant was sent two invitations to participate and four follow-up emails. At least one of these emails was opened by 254 faculty in the state, and a total of 99 STEM faculty members completed the survey, for a response rate of 39%. A copy of the survey is provided in the appendix.

Fifty-eight percent of the sample was male, with the remaining 42% female. The racial and ethnic profiles of the sample were predominantly White, with 60% White, 10% Asian, 8% Black or African American, 5% Latina/o, and less than 1% American Indian or Alaskan Native, Native Hawaiian or Pacific Islander, or other. Respondents' ages ranged from 25 to 74; 15% were between 25–34, 30% were between 35–44, 27% were between 45–54, 22% were between 55–64, and 6% were over 65. Over half (55%), of

the respondents' highest degree was a master's degree, with 38% of the sample reporting having a doctoral degree. Only 2.5% reported their highest degree was a bachelor's degree, and 1% reported having a terminal professional degree (e.g., law degree).

Seventy-four percent of the respondents were full-time faculty, 16% were part-time faculty at a single institution, and 10% held part-time faculty positions at multiple institutions. Over half of the sample, 62%, were tenured, with an additional 10% in tenure-track positions. Course loads for the respondents ranged from one to seven courses per semester, with most respondents teaching three to four courses per semester (mean 3.4). Three-quarters of the sample taught in a single STEM discipline, with the remaining quarter teaching in more than one STEM discipline. Respondents reported teaching in a variety of STEM fields, with the largest percentage of faculty focusing on mathematics (30%), physical sciences (27%), and biological and life sciences (13%).

### Culturally Responsive Pedagogical Practices

STEM faculty reported that their pedagogy focused on building students' abilities to think analytically, collaborate with others, and learn effectively on their own (Table 6). In contrast, faculty reported that they focused less on effective writing, effective speaking, developing a personal code of values and ethics, and developing career goals. This may be in part reflective of the separation in many colleges of the roles of advising (advisor) and academic preparation (faculty).

**Table 6. The Pedagogical Focus Areas in STEM Courses at Minority-Serving Community Colleges**

Focus area	<i>n</i>	Very much	Quite a bit	Some	Very little	None
Broad general education	85	35%	38%	19%	7%	1%
Occupation-specific knowledge and skills	84	32%	25%	32%	8%	2%
Effective writing	84	11%	21%	40%	24%	4%
Effective speaking	84	6%	17%	50%	20%	7%
Analytical thinking	84	70%	26%	4%	0%	0%
Collaborative skills	84	46%	32%	21%	0%	0%
Learning effectively on their own	84	43%	45%	12%	0%	0%
Developing a personal code of values and ethics	83	16%	33%	34%	17%	1%
Developing career goals	84	14%	25%	39%	20%	1%
Gaining information about career opportunities	84	17%	21%	33%	25%	4%

Note. Percentages may not add up to 100% due to rounding.

Respondents specifically acknowledged that the classroom environment needed to be welcoming and inclusive for all students. Critically, 78% of faculty reported that they created a learning environment that welcomed engagement in the classroom (Table 7). Further, 56% of faculty reported having created an environment that welcomed student academic engagement outside of the classroom. This appears to be at least in part be through the development of personal relationships with underrepresented minority students (37%). However, less than a quarter of faculty (24%) included discussions on the need for diversified STEM workforce in their courses. Further, less than a fifth (18%) reported using culturally relevant delivery of course content.

Respondents identified the need to become better educated on the use of culturally responsive practices to meet the needs of the diverse populations of students served in their classrooms. Respondents highlighted the value of professional development on culturally responsive practices and highlighted the need for more opportunities in this area. Respondents shared, "[I] try to educate myself about and

use best practices for better success for said group,” and “I participate in all training that is available to me. The training has led to some dramatic changes in my classrooms but many small changes.” One respondent discussed a change made in the classroom as a result of training: “One of the small things that I have changed is that I make deliberate choices of names and situations in application problems to better reflect the cultural makeup of my classrooms.” Another faculty member discussed working specifically with students from immigrant or international families to overcome language barriers and enhance learning in the classroom. Another faculty member realized the importance of students seeing people who looked like them, or who may have had similar backgrounds, inviting minorities in STEM to speak to their class.

**Table 7. Extent STEM Faculty Reported Using Culturally Relevant Pedagogical Strategies at Minority-Serving Community Colleges**

Pedagogical strategy	<i>n</i>	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree	N/A
Create an environment that welcomes student academic engagement outside of the classroom	84	56%	38%	4%	0%	1%	1%
Use strategies for building personal relationships with underrepresented minority students	84	37%	36%	17%	10%	0%	1%
Use culturally relevant delivery of course content	84	18%	31%	29%	7%	7%	8%
Effectively communicate high expectations	84	74%	21%	4%	0%	0%	1%
Use collaborative learning techniques	84	60%	32%	5%	4%	0%	0%
Create an environment that welcomes engagement in the classroom	85	78%	20%	2%	0%	0%	0%
Discuss the need for a diversified STEM workforce in class	84	24%	18%	29%	19%	11%	0%

Note. Percentages may not add up to 100% due to rounding.

## Student Supports

When asked about supporting underrepresented students, many of the respondents reported an understanding of the issues the population faced and identified strategies used to alleviate barriers to their underrepresented students’ success in STEM. These strategies can be summarized into two themes: targeted resources and opportunities, and proactive engagement and mentorship. There were few respondents who indicated that no additional effort or support was provided for minority students, stating that all students were supported equally.

**Targeted Resources and Opportunities.** In discussing resources, faculty discussed the importance of targeted resources and opportunities for their students. Faculty were intentional in providing students with an introduction and access to institutional resources such as tutoring centers, and/or STEM-related clubs and student organizations. Faculty and administration also formed collaborative relationships with four-year institutions and community partners, creating a network of additional support for their minority STEM students. Many faculty also identified the establishment of collaborative bridge programs and STEM developmental education programming as means of aiding students who were not prepared for the rigor of college-level work. One faculty member shared their efforts at their institution:



"I have started a dual credit program in physical geology and targeted an urban low income, underperforming school with a 96% minority student demographic as the first school I wanted to teach at. We are currently offering four sections of the class at the high school each year."

STEM-related scholarship and research opportunities were also available to students, with community college faculty providing letters of recommendation in support of their students' endeavors. One faculty member's response highlighted the importance of membership for minority STEM students, as his/her institution allowed high-achieving minority STEM students the opportunity to mentor to area high schools.

**Proactive Engagement and Mentorship.** In response to family and socio-economic status and potential deterrents to students staying the course, faculty developed an interest in being proactive in engaging and mentoring minority STEM students. Most faculty discussed the importance of increased attention, which included reaching out to students who showed early signs of struggling in their coursework, and being intentional in encouraging students into STEM due to there being an underrepresentation of minority students. Almost half of the faculty (46%) reported that they spent a great deal of time reaching out to students who were underperforming (Table 8). Nearly a third of faculty (36%) reported spending a great deal of time directly connecting students to individuals they knew in support services when referring them to help. One faculty member shared their strategy:

"I reach out to students who are struggling, assess and help them with difficult concepts throughout each class session, and refer them to the tutoring center and other campus resources. I also provide information about opportunities outside the classroom (i.e., clubs, REUs) that they can use and advise that they will help in transferring and starting a career."

Mentorship also showed up several times in faculty responses, with faculty citing the need to connect with students on a personal level and build confidence: "The biggest steps I take are at the personal level. I know many students from underrepresented groups don't always feel connected to the system, so I make sure to reach out personally throughout the semester." Another faculty member shared their experience:

"Since nearly all of my students (85–90%) are underrepresented racial/ethnic minority students, I spend most of my time advising them on their success in my classes and college in general. I try to instill in the students the confidence to excel, by explaining from my experiences the things that will help them most. . . commitment, drive, work ethic."

Through mentorship, faculty used themselves and their personal experiences as a guide for students and encouraged the pursuit of advanced education in STEM-related fields.

**Table 8. Extent that STEM Faculty at Minority-Serving Community Colleges Engaged in Proactive Engagement Strategies**

Engagement strategy	<i>n</i>	A great deal	A moderate amount	Occasionally	Rarely	Never
Follow up with students who don't attend full class sessions (e.g., miss class, arrive late, leave early)	84	32%	36%	20%	10%	2%
Reach out to students who are underperforming to assess their situation and offer support	85	46%	36%	15%	2%	0%
Directly connect students to individuals they know in support services when referring them for help	84	36%	35%	23%	7%	0%

Note. Percentages may not add up to 100% due to rounding.

## Academic Advising

Many responses indicate that the faculty in this study did not participate in academic advising, as academic advising was generally handled by academic advisors or counselors at their respective institutions. However, further elaboration into their roles as faculty indicated that, while they were not academic advisors, some advisement did take place. Responses indicated that faculty participated in informal, intentional, and non-differentiated advising, and that this advising often included advising students about their transfer options.

**Informal Advising.** In reviewing the responses, it was clear that some form of informal advising occurred. Many responses indicated that faculty members engaged students in conversations regarding their academic and personal goals and interests, often using class time to provide advice. One faculty member discussed utilizing class time for advising:

“I would take a lecture hour and turn it into an advising hour discussing which classes should be taken next. Go over the catalog and discuss the variety of degrees and certificates and focus on the math and science courses that are needed for each degree and certificate.”

Other faculty encouraged students to contact them if interested in STEM majors and programs. Informal advising also occurred when faculty aided in students’ process to transfer to four-year institutions, as some faculty discussed transfer programs and kept track of articulation agreements in health and STEM fields:

“I work informally with my students to make them aware of my school’s resources and programs. I also try to let them know about transfer schools that have programs in their areas of interest. I also keep track of any articulation agreements between my school and transfer schools in the areas of the health professions and or STEM fields.”

**Intentional Advising.** Intentional advising is reflected in the creation of personal and mentorship relationships with students. Faculty discussed the need to create a space in which students felt comfortable, that the content of the courses mattered, and that they could relate from their own perspectives. As such, faculty purposefully reached out to minority students more frequently than to non-minority students. Additionally, faculty were more intentional in their efforts to provide resources for their minority students and assisted those students in making contacts and navigating various paths to STEM degrees. One respondent shared their efforts: “I try to make a personal connection with all students (including underrepresented minorities) and make sure they follow up with resources I suggest. Sometimes that means walking them down to a resource and introducing them to someone in that office.” Another faculty member shared their desire to be a role model for their minority students, as often students from underserved populations have no one to look to for guidance: “By me being one of the few minority instructors here at our community college, and being a math instructor, students value my presence and expertise and thereby come to me for help in their courses. I can be described as a role model here.”

Similarly, another participant shared their strategy of being an example:

“My approach towards advising is first demonstrated by personal example. I am an African-American female chemistry professor who has worked in the field of chemistry. I use myself and my experiences as examples and they relate that to the issues facing them in today’s world. For most of my students, they have never had contact with a person with my background that is willing to assist them in developing their goals into a STEM career.”

Responses also indicated that faculty were intentional in their mentoring and advisement efforts as it related to expanding student opportunities and reflecting what they saw as assets in their students. This can be seen in the purposeful encouragement in getting students to self-identify their strengths and opportunities.

**Non-Differentiated Advising.** Three faculty members indicated that their approach towards academic advising, if any advising is done at all, is very general and not tailored specifically towards underrepresented minorities. One respondent shared, “I am just neutral with respect towards race, culture, religion, ethnicity, etc. In other words I am universally neutral.” The responses reflected that all students were given the same level of effort and attention, regardless of race and ethnicity. Another faculty member expressed the idea that all students should learn to be responsible for their own learning.

**Table 9. Extent STEM Faculty at Minority-Serving Community Colleges Report Focusing on Specific Advising Strategies**

Advising strategy	<i>n</i>	A great deal	A moderate amount	Occasionally	Rarely	Never
Students’ knowledge	77	72%	25%	3%	0%	0%
Integration and participation in networks and professional venues (e.g., professional associations, department, schools, etc.)	81	17%	30%	31%	17%	5%
Effective decision making regarding STEM pathways	82	34%	33%	21%	10%	2%
I assess problems and possible solutions in a collaborative manner with students I advise	81	46%	38%	14%	2%	0%

Note. Percentages may not add up to 100% due to rounding.

### Transfer Pathways for STEM

When asked about ample transfer pathways in STEM fields, most of the respondents (94%) indicated that their institution had some form of transfer pathway. However, responses indicated that most transfer pathways within their institutions were either to specific institutions or not STEM specific. Most responses can be summarized as: “We have a number of degrees and articulation agreements with a number of four-year schools,” an indication that the institutions did provide some transfer pathways for their students. Also noted were faculty perceptions of transfer pathways. One respondent stated, “yes, there are pathways, but most are unrealistic for these students.” Another respondent answered, “there are some, but many are outdated or underutilized.” Some of the specific programs mentioned include physics, pre-engineering, physical science, and pharmacy.

**Table 10. STEM Faculty Self-Reported Transfer Knowledge and Advising Practices**

	<i>n</i>	Yes	No	n/a
I am familiar with my institution’s transfer programs	82	80%	18%	1%
I am familiar with the transfer programs in my discipline	82	85%	11%	4%
I am familiar with my institution’s articulation agreements (transfer articulation)	81	73%	26%	1%
I regularly advise students on STEM transfer opportunities (e.g., short-term certificates, long-term certificates, 2+2)	82	37%	54%	10%
I routinely provide guidance to students seeking STEM careers following attendance at our community college	83	58%	31%	11%

### Challenges to Teaching at an MSCC

In reviewing responses related to the challenges related to being faculty at an MSCC, it was noted that many of the items named were issues present in community colleges in general. The responses noted the challenges as related to academic preparedness, resources, administration, and student time and resources.

**Academic Unpreparedness.** Many respondents identified that minority students were not persisting at their institutions, citing academic unpreparedness as one of the major challenges and disadvantages. Faculty responses indicated that many students entered the community college and found themselves stuck in developmental coursework, thus limiting the courses students could enroll in and, in some cases, stalling students out. Faculty also noted that students did not demonstrate strong, positive relationships with science and mathematics, not only creating a lag in knowledge but also setting them up for failure. One faculty member noted, "Many are placed into classes for which they have not adequately met prerequisites or course recommendations. I think they are virtually set up for failure as a result."

**Resources.** Many respondents indicated that resources also presented a challenge. Several faculty indicated that students were unaware of the resources available to them, if any, and how to use them. One faculty member stated, "Many students are not aware of the resources the college offers and need time and guidance on how to utilize career and advising support." Responses also indicated that in addition to a lack of funding, which is not uncommon for community colleges, the shortage of resources extended not just to students but also to STEM faculty. While a majority of the responses indicated that resources were a challenge, no specific examples were provided.

**Administration.** Many respondents indicated that their college's administration presented a major challenge to them as faculty members. Several faculty noted the lack of support they received from their institutions in supporting their students. One faculty member shared, "the institution pays lip service to STEM in general." Another faculty respondent felt that the institution did not understand what was needed to prepare minority students for STEM fields: "The misunderstanding of the administration in terms of preparing students for STEM fields. The failure of the system to hire, thus have examples of minority faculty in the STEM fields." Several respondents indicated that insufficient training in cultural competence presented an issue when preparing minority students. Identified was the need for more training on cultural challenges and issues, communication, and learning styles.

Faculty also noted that, in some cases, institutions lack courses beyond the introductory level, presenting a limitation to students' interest and adequate preparation for transfer. According to one respondent, "The lack of coursework beyond introductory courses is the disadvantage. Geology 101, Astronomy 101. . . We don't offer courses beyond those to cultivate enough interest in them for a student to transfer with the intention of an earth science major." Also discussed was the challenge of multi-tasking, as faculty indicated that their academic departments were severely understaffed, resulting in having large teaching loads, working multiple positions, and having less time to dedicate to assisting students. Faculty shared their frustration with being overworked and over-extended. One respondent shared their concerns:

"The disadvantage in my department is that we are understaffed and I teach 21 load hours every semester and seven load hours every summer. I also do curriculum development, work on purchasing equipment, and other support activities necessary in a laboratory course. I teach chemistry. I'm constantly exhausted and feel overextended."

**Student Time and Resources.** Faculty responses indicated a concern related to the cultural backgrounds of the students and their impact on their academics. Respondents were very aware of the issues and challenges their students faced. Heavily discussed were the barriers that minority student populations encounter, including a lack of role models, inadequate access to resources and school materials, and financial pressures. One faculty member shared their thoughts: "A disadvantage is that many of them are not only from diverse ethnic backgrounds, they are also from less affluent backgrounds. Texts, computers and other materials can be a real struggle for them to afford."

Respondents specifically discussed issues surrounding time management, stating that many students from minority populations encountered various familial and work responsibilities, leaving little time for studying. Specifically, faculty found that minority students usually worked more hours and had less time for studying, resulting in "enthusiastic, engaged students not performing as well in class." One respondent spoke more specifically about their observation:

“Many are first-generation college students. They often have so many different things on their plates. Many have a great many family responsibilities. Often the family members don’t understand the pressure they are putting on the students when they are trying to balance family and school. It is very challenging.”

### Advantages to Teaching at an MSCC

When asked about the advantages of being a faculty member at an MSCC, many of the respondents identified diversity, fulfillment, the students, and development. Many of the faculty indicated that the opportunity to work with a diverse population was a primary advantage of being at an MSCC. They also discussed the range of backgrounds, perspectives, and experiences that students brought to the classroom, exposing each other to various cultures, new ways of thinking, new ideas, and new challenges. Fulfillment or personal satisfaction was also discussed in the context of helping students succeed who may not otherwise have had certain opportunities. Respondents expressed feeling that they were making a significant difference in the lives of their students by contributing to their growth, development, and success. One faculty member specifically talked about feeling personal satisfaction about having played a small role in “improving access to higher education and promoting equity and diversity in the sciences.”

**Table 11. STEM Faculty Perceptions of Teaching at Minority-Serving Community Colleges**

	<i>n</i>	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree
I highly value teaching at an MSCC	83	81%	12%	7%	0%	0%
I was intentional about a career at an MSCC	82	30%	28%	22%	2%	17%
I purposefully sought teaching at the community college level	82	65%	18%	11%	2%	4%
This institution produces equitable student outcomes across diverse learners (e.g., policies, programs, practices, or situations that contribute to equality in educational performance/results)	82	60%	30%	6%	4%	0%

The students themselves were also identified as an advantage, as faculty identified the pride and determination students showed in their academic pursuits:

“From my perspective, the pride that the majority of students have in attending college. . . . Nearly all of my students are the first generation of their family to attend college, so they are proud of that fact and it improves their dedication to being successful. I did not experience students with that attitude at the university level.”

Other faculty shared their experiences of students being engaged and eager to learn, despite their ages and backgrounds. Last, faculty discussed their development as a MSCC faculty member. A few respondents indicated that they appreciated the challenge of working with a diverse population, as it allowed them to incorporate different teaching styles and perspectives and encourage a non-traditional approach to learning. Other respondents shared that working at a MSCC allowed them to identify and network with faculty who were dedicated to advancing science education for underrepresented minority populations.

## Discussion

Illinois MSCCs provide a critical on-ramp to postsecondary education for nearly a third of all community college students in the state. Among these students are 62% of the Latino students, 55% of the African American students, and 44% of the Nonresident Alien students. Most Illinois MSCCs operate in communities with limited resources and lower levels of educational achievement among residents. Additionally, Illinois MSCCs serve substantially more students with high financial needs and students engaging in adult basic education, English as a second language education, and adult secondary education. Despite all of these factors, Illinois MSCCs maintain completion rates for both degrees and certificates comparable to those of non-MSCCs.

Faculty reported that the diversity of their students was a key advantage to working at an MSCC. Additionally, they described their work as fulfilling and described their students as studious and dedicated. However, despite reporting positives to working at MSCCs, faculty described critical barriers, including high rates of student unpreparedness, lack of resources in general, and a lack of support from administration, to their ability to effectively serve students.

Nearly all STEM faculty at MSCCs who completed our survey acknowledged that the classroom environment needs to be welcoming and inclusive for all students, while highlighting the need for professional development on culturally responsive pedagogy and advising. STEM faculty at MSCCs reported several approaches to advising and supporting their students, some of which reflected a commitment to providing culturally responsive supports. These include, providing informal, intentional, and non-differentiated advising to students. It is unclear if faculty who approach advising from a non-differential paradigm fail to recognize systemic barriers for minority students or serve in institutions that predominantly serve underserved minority and ethnic populations and therefore apply their approach to their students more universally. Faculty acknowledged the need for active student supports for underserved populations of students, including targeted resources and opportunities, proactive engagement and mentoring, and culturally responsive curricula. Overall this study supports the need for additional research focused on drawing out the systemic differences in the practices, policies, and cultures in place at MSCCs that support the success of underserved racial minorities and other underserved student subgroups.

## References

- American Association of Community Colleges. (2016, February). *Fast facts*. Washington, DC: Author.
- Aragon, S. R., & Zamani, E. M. (2002). Promoting access and equity through minority serving institutions. In M.C. Brown (Ed.), *Equity and access in higher education: Changing the definition of educational opportunity* (Readings on equal education), no. 18. New York, NY: AMS Press, Inc.
- Center for Minority Serving Institutions. (n.d.a). *What are MSIs?* Philadelphia, PA: Penn Center for Minority Serving Institutions.
- Center for Minority Serving Institutions. (n.d.b). *MSI directory*. Philadelphia, PA: Penn Center for Minority Serving Institutions.
- City Colleges of Chicago. (2017). *Colleges*. Chicago, IL: Author.
- City-Data. (2017). *Chicago neighborhoods*. Stamford, CT: Pitney Bowes, Inc.
- College of Lake County. (2017). *Who we are*. Grayslake IL: Author.
- Elgin Community College. (2017). *College history*. Elgin, IL: Author.
- Gasman, M., & Nguyen, T-H. (2014). Historically Black Colleges and Universities (HBCUs): Leading our nation's effort to improve the science, technology, engineering, and mathematics (STEM) pipeline. *Texas Education Review*, 2(1), 75-89.
- Hagedorn, L. S., Chi, W. Y., Cepeda, R. M., & McLain, M. (2007). An investigation of critical mass: The role of Latino representation in the success of urban community college students. *Research in Higher Education*, 4, 73-91.
- Illinois Community College Board. (2017). *Data and characteristics of the Illinois public community college system, 2017*. Springfield, IL: Author.
- Morton College. (2017). *History*. Cicero, IL: Author.
- National Center for Education Statistics. (2007). *Characteristics of minority-serving institutions and minority undergraduates enrolled in these institutions*. Washington, DC: U.S. Department of Education, Institute of Education Sciences.
- National Center for Education Statistics. (2016). *College navigator*. Washington, DC: U.S. Department of Education, Institute of Education Statistics.
- Núñez, A. M., Hurtado, S., & Galdeano, E. C. (Eds.). (2015). *Hispanic-serving institutions: Advancing research and transformative practice*. New York: Routledge.
- Prairie State College. (2017). *About us*. Chicago Heights, IL: Author.
- South Suburban College. (2017). *About ASSC*. South Holland, IL: Author.
- Triton College. (2017). *Triton college facts*. River Grove, IL: Author.
- Waubonsee Community College. (2017). *About us*. Sugar Grove, IL: Author.

## Appendix

### STEM Faculty at Minority-Serving Community Colleges Survey

#### Instructional Strategies

Instructions: Please mark the response that most accurately reflects your perceptions. This section asks about your instructional strategies and particular outcomes of your course.

To what extent do you agree with the following?

	Agree	Somewhat Agree	Neutral	Somewhat Disagree	Disagree	N/A
I create an environment that welcomes student academic engagement outside of the classroom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use strategies for building personal relationships with underrepresented minority students	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use culturally relevant delivery of course content	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I effectively communicate high expectations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use collaborative learning techniques	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I create an environment that welcomes engagement in the classroom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I discuss the need for a diversified STEM workforce in class	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



To what extent do the students in your courses gain knowledge, skills, and professional development in the following areas?

	Very much	Quite a bit	Some	Very little	None
Broad general education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Occupation specific knowledge and skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Effective writing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Effective speaking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analytical thinking	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Collaborative skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Learning effectively on their own	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing a personal code of values and ethics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Developing career goals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Gaining information about career opportunities	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Student Interactions

The following question asks you about student interaction in the courses you teach.

How often do you do the following?

	A great deal	A moderate amount	Occasionally	Rarely	Never
I reach out to students who are under-performing to assess their situation and offer support	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I directly connect students to individuals I know in support services when referring them for help	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I follow up with students who don't attend full class sessions (e.g., miss class, arrive late, leave early)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Advising Practices

The following sections asks you about your advising practices.

### When advising students I work to facilitate:

	A great deal	A moderate amount	Occasionally	Rarely	Never
Students knowledge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Integration and participation in networks and professional venues (e.g., professional associations, department, schools, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Effective decision making regarding STEM pathways	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I assess problems and possible solutions in a collaborative manner with students I advise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Transfer knowledge and support:

	Yes	No	N/A
I am familiar with my institutions transfer programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am familiar with the transfer programs in my discipline	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am familiar with my institutions articulation agreements (transfer articulation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I regularly advise students on STEM transfer opportunities (e.g., short-term certificates, long-term certificates, 2+2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I routinely provide guidance to students seeking STEM careers following attendance at our community college	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Perception of Teaching at Minority-Serving Community Colleges

Please share your thoughts regarding teaching at an minority-serving community college

	Agree	Somewhat agree	Neutral	Somewhat disagree	Disagree
I highly value teaching at an MSCC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was intentional about a career at a MSCC	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I purposefully sought teaching at the community college level	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
This institution produces equitable student outcomes across diverse learners (e.g., policies, programs, practices, or situations that contribute to equality in educational performance/results)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Open-Ended Questions

What actions do you take to support underrepresented racial/ethnic minority students in STEM at the community college level?

In what ways does your approach towards academic advising impact underrepresented minorities at your college?

Are there ample transfer pathways in STEM fields at your institution?

What challenges do you encounter supporting underrepresented minority students in STEM?

What are the advantages and disadvantages of being a faculty member at a minority-serving community college?

## Demographics

**Please indicate the racial/ethnic group with which you identify (mark all that apply)**

- African–American or Black
- American Indian or Alaskan Native
- Asian
- Native Hawaiian or other Pacific Islander
- White
- Some other race (please specify)

**Please indicate your age (mark only one response)**

- 24 and under
- 25–34
- 35–44
- 45–54
- 55–64
- 65–74
- 85 years and older

**Please indicate your gender identity (mark only one response)**

- Female
- Male
- Gender Non–Conforming
- Transgender

**Please indicate your highest level of education (mark only one)**

- Associate degree
- Bachelor’s degree
- Master’s degree
- Terminal professional degree (e.g., JD, MBA, MFA)
- Practitioner doctorates (e.g., MD, EdD, PsyD)
- PhD
- Other (please specify)

**Which best describes your employment (mark only one response)**

- Full-time faculty (tenured)
- Full-time faculty (tenure track)
- Full-time faculty (non-tenure track)
- Part-time faculty (teaching at one institution)
- Part-time faculty (teaching at multiple institutions)

**How many classes do you typically teach per term?****Do you teach in more than one STEM discipline?**

- Yes
- No

**Which discipline do you spend most of your instructional time?**

- Agricultural sciences
- Biological and life sciences
- Computer and information sciences
- Engineering and related fields (e.g., computer, mechanical)
- Environmental sciences and related fields
- Mathematics
- Physical sciences (e.g., chemistry, astronomy, physics)
- Other (please specify)