



State of the Field

Findings From the 2019 National
Survey of Postsecondary
Competency-Based Education



at American Institutes for Research ■

Acknowledgments

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Executive Summary

This report is based on the 2019 National Survey of Postsecondary Competency-Based Education (NSPCBE), the second in a series of three annual surveys by the American Institutes for Research that seeks to understand and track the landscape of postsecondary competency-based education (CBE) at institutions of higher education in the United States. It explores institutions' perceptions of CBE, interest level, implementation, and adoption progress, with the goal of providing those interested in CBE, ranging from policymakers to institution leaders, an assessment of the state of the field to inform their actions.

Broadly, we find that, despite persistent barriers to CBE implementation, CBE is experiencing slow but steady growth nationally, and institutions remain optimistic about the likelihood that CBE will continue to grow. This year, we explore new questions about pathways to CBE adoption, the types of students enrolling in CBE programs, program pricing, and the types of institutions adopting CBE.

This report presents findings related to four key questions about the state of the field in 2019:

1. **CBE Adoption.** *Which institutions are adopting CBE, and what are their motivations for doing so?*
CBE adoption efforts span all institution types, and we see indications of growth in the number of programs; however, much adoption activity remains piecemeal, with many institutions adopting some, but not all elements of CBE. Most institutions consider CBE as a tool for advancing specific institutional goals, rather than the primary mode of operation for the institution.

2. **CBE Programs.** *What do we know about the structure and scale of CBE programs?*
Most CBE programs are being offered in a variety of modalities and are currently serving relatively small numbers of students. The top disciplines offered are consistent with the top-enrolling disciplines nationwide, and faculty still fulfill a broad range of roles.
3. **CBE Students.** *How are CBE programs serving students?*
More research is needed, but early indications suggest that CBE programs often serve a greater proportion of students with prior credits than traditional programs, and institutions price their CBE programs so that the amount students pay may be similar to or lower than for traditional programs.
4. **Barriers, Facilitators, and the Future of CBE.** *How do institutions perceive the potential to implement and scale CBE?*
Despite the perceived barriers to CBE implementation—both internal and external to the institution—most institutions remain optimistic about the future of CBE nationally and at their own institution.

These findings present a more nuanced picture than our report provided last year, exploring more deeply the conclusion that CBE represents a compelling and valuable idea for many institutions. Although we find that this is still largely the case, there continue to be many barriers and pressures—related to internal business processes and costs as well as external regulation—that may be contributing to gradual or piecemeal adoption. Finally, we reconsider the key questions we raised last year, including whether CBE can (a) effectively address institutions' learner-centric goals through piecemeal adoption and (b) succeed in traditional institutional contexts and the current policy environment.



2019: Slow but steady growth; optimism about continued growth.

2019 versus 2018: 64 institutions reported current operation of 588 full CBE programs, compared with the 2018 totals of 57 institutions reporting on 512 programs.

Growth prospects: 76% of the institutions expect that the number of CBE programs nationally will increase in the next 5 years.

Introduction

The National Survey of Postsecondary Competency-Based Education (NSPCBE) is an annual survey by the American Institutes for Research that seeks to understand the landscape of postsecondary competency-based education (CBE) nationwide. This survey of college and university leaders builds knowledge in the field about the scale of CBE in the United States and tracks its evolution. In this report, we present updated findings based on the 2019 NSPCBE—the second survey in a series of three annual surveys—and explore new questions. In particular, new questions include exploring pathways to CBE adoption by reporting what steps those in the “planning stage” have accomplished to date, as well as questions about who enrolls in CBE programs and the costs they incur.

What Is CBE?

As an innovative, nontraditional approach to postsecondary education, CBE has attracted attention from leaders of institutions of higher education (IHEs),¹ policymakers, and other stakeholders. Varied definitions of CBE exist in the field, but the definitions have several common components:

- Curricula are designed around specific competencies.
- Advancement focuses on a demonstration of competency.
- The time students take to demonstrate a competency can vary.

By tying learning to competencies rather than traditional programs' grades and credit hours, CBE can offer a “learner-centered” model that has the potential to improve the quality of learning, expand access for nontraditional students,² and lower costs for students.

What Are We Learning About CBE Nationally?

The broad takeaway from the 2018 NSPCBE was that the learner-centric logic of CBE appeared to be compelling to many institutions, as evidenced by the fact that institutions collectively reported operating more than 500 CBE programs as well as widespread optimism that CBE would grow nationwide (Lurie, Mason, & Parsons, 2019). Still, this year's survey identified significant barriers to implementing and scaling CBE programs within institutions. These barriers reflect the fact that CBE program implementation often requires a shift in the way traditional postsecondary institutions operate, which hinders full scale implementation of CBE program elements.

Why Is Continued Research Important?

Continued research about institutions' perceptions of and adoption of CBE remains relevant because the policy and practice landscape is evolving. For instance, the 2018 NSPCBE results demonstrated that the field has not settled; substantial variation exists in the field in terms of implementation, and many institutions are still considering or planning to adopt CBE. In addition, the policy environment has changed and appears likely to continue evolving. After the 2018 NSPCBE report was issued, but before the 2019 NSPCBE survey was sent to institutions, the U.S. Department of Education (ED) may have reduced some uncertainty by issuing an important final audit determination about a well-known CBE institution (Western Governors University), concluding that the institution had not violated the regulations affecting Title IV financial aid eligibility (ED, 2019). In addition, during the administration of the 2019 NSPCBE, a

¹ Throughout this report we use the term institutions to refer broadly to IHEs, particularly colleges and universities. The Methods section includes more detail about our population.

negotiated rule-making panel convened by ED considered several issues pertinent to CBE, including trying to address common definitional questions. Finally, to inform reauthorization of the Higher Education Act, the House Committee on Education and Labor Committee held a hearing on June 19, 2019, that explored potential topics of interest related to innovations in higher education, including CBE.

The 2019 NSPCBE, supported by Lumina Foundation, continues our effort to understand this evolving area. It builds on the 2018 NSPCBE, which was administered in partnership with Eduventures, as well as Eduventures' 2016 *Deconstructing CBE* report,³ which was a study of CBE implementation, goals, and challenges at 251 institutions. Taken together, this research provides a baseline for future research and supports the development of the field's understanding of CBE implementation.

This report presents findings related to four key questions about the state of the field in 2019:

- 1. CBE Adoption:** Which institutions are adopting CBE, and what are their motivations for doing so?
- 2. CBE Programs:** What do we know about the structure and scale of CBE programs?
- 3. CBE Students:** How are CBE programs serving students?
- 4. Barriers, Facilitators, and the Future of CBE:** How do institutions perceive the potential to implement and scale CBE?

Broadly, we find that, despite persistent barriers to CBE implementation, CBE is experiencing slow but steady growth nationally, and institutions remain optimistic about the likelihood that CBE will continue to grow nationally. Appendix A provides descriptive statistics for key survey question responses, further highlighting patterns of implementation among those that have CBE programs or are in the process of adopting them.

³ Eduventures' 2016 *Deconstructing CBE* study found that despite a great deal of interest in CBE, apart from a few notable exceptions where CBE is the dominant mode of instruction, implementation remained relatively small scale and fragmented and was typically targeted at supporting the needs of working adult learners. For more information, see Garret and Lurie (2016).

A young woman with voluminous, curly, light brown hair is shown in profile, looking towards the right. She is wearing a light blue button-down shirt with a dark collar. The background is blurred, suggesting an indoor setting like a classroom or office. The overall tone is professional and collaborative.

Survey Development

Measuring an area of “innovation” through a survey—particularly when words or phrases may mean slightly different things to different people—is a challenging task. We acknowledge that the survey necessarily relies on self-reported data, and because the findings represent one response per institution, the appropriateness of the respondent also is important. An advisory board of key leaders and experts involved in leading or studying CBE provided guidance and insight about the questions, response options, and necessary changes from last year to better understand the

field. Capturing longitudinal data was again a priority for the NSPCBE, given our goal of attempting to track the development of the field across time. To that end, the survey instrument for 2019 remained largely consistent with that in 2018, with some limited exceptions related to the effectiveness of questions and efforts to better understand certain topics. Details of these changes are presented in Appendix B.

Sample

Broadly, the survey administration protocol followed last year's approach. The 2019 NSPCBE invitation was sent to 3,279 institutions in March 2019, representing more than two thirds of the 2- and 4-year institutions listed in the Integrated Postsecondary Education Data System (IPEDS).⁴ In most cases, the invitation went to provosts and institutional research contacts, with the same request as last year that they forward it along if another contact person was more appropriate. In the survey itself, we asked respondents to report their roles.

Of the 3,279 institutions, 602 provided a response, which represents 101 more institutions responding this year compared with last year and an overall response rate of 18.4%. Of the 602 respondents to this year's survey, 193 of them also responded in 2018; throughout this report, we include occasional references to longitudinal analyses we conducted on the 193 institutions that responded in both years.⁵

Figure 1. Respondents by Institution Type

- Public
- Private nonprofit
- Private for-profit

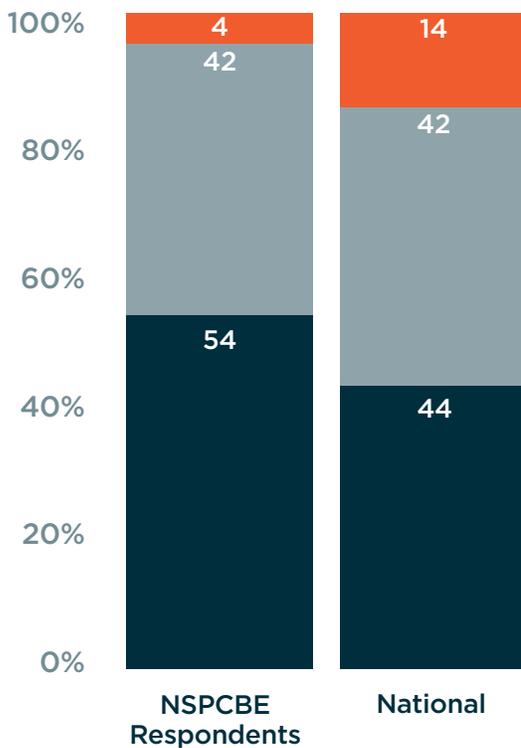
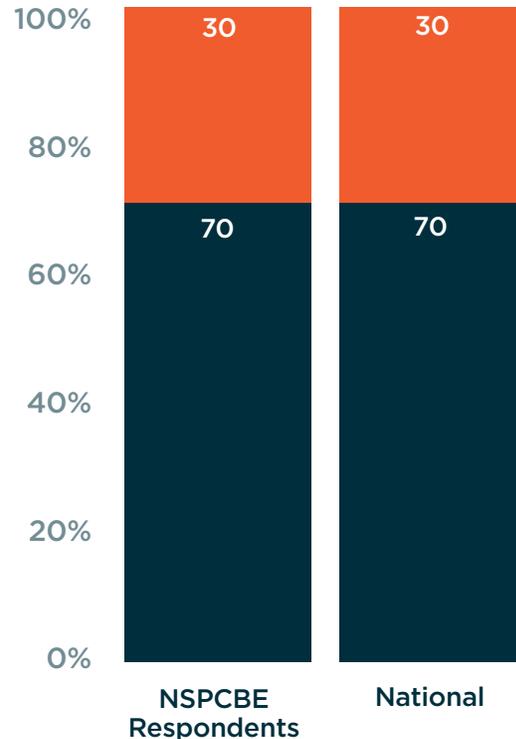


Figure 2. Respondents by Level

- 4-year
- 2-year



⁴ IPEDS is a data system that includes every U.S. college, university, and technical and vocational institution that participates in the federal student financial aid programs. Two thirds is the proportion of 2- and 4-year institutions for which we could obtain contact information. For more information about this process, see Appendix B.

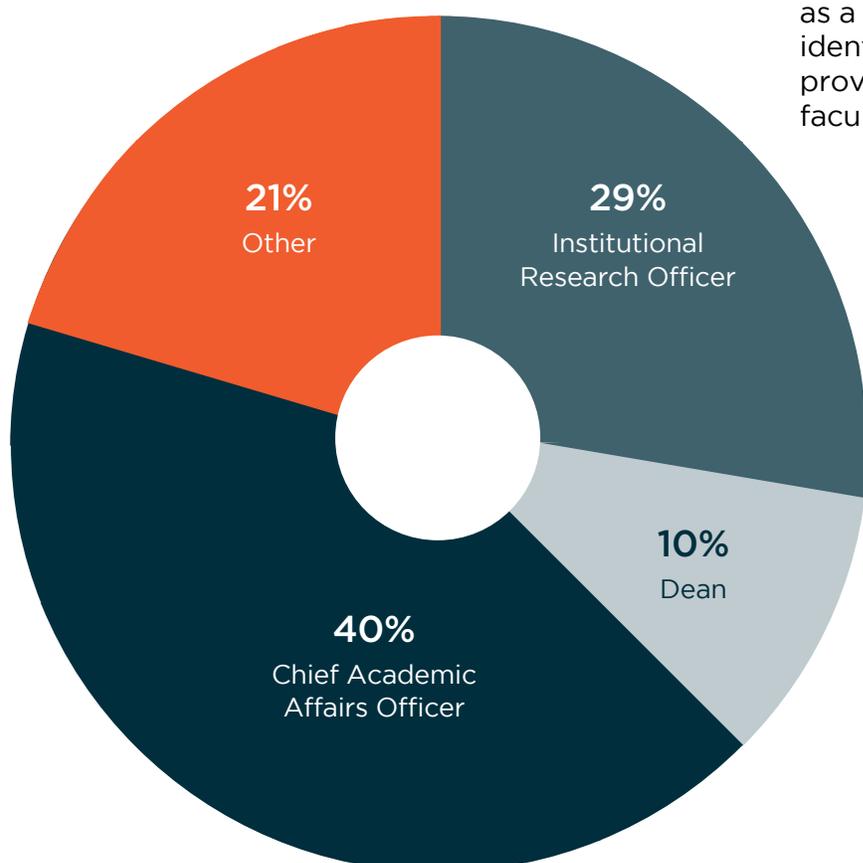
⁵ When we also consider the 2016 Eduventures *Deconstructing CBE* survey, 44 institutions responded in all three years.

Looking more closely at the 602 institutions that responded in 2019, 54% of the responses were from public institutions, 42% of the responses were from private, nonprofit institutions, and 4% of the responses were from private, for-profit institutions (see Figure 1), which means that public institutions were overrepresented and private, for-profit institutions were underrepresented relative to the population of 2- and 4-year institutions in IPEDS. By level, 70% of the responses were from 4-year institutions, and 30% of the responses were from 2-year institutions, which is in line with the overall distribution of our target population (see Figure 2).

Given that institutions with CBE programs or an interest in adopting them may be more likely to respond, there always is a possibility that those responding may not represent the full population of institutions nationwide. To address this potential bias in our sample, we assigned a weight to each responding institution based on how likely comparable institutions were to respond to the survey. This means that our weighted findings represent the national set of 2- and 4-year institutions. Counts and percentages reported throughout this section on methods and sample are not weighted, whereas percentages reported in our key findings and appendices are weighted. For a more detailed description of the survey weights and the overall methodological approach, see Appendix B.

To better understand respondents' perspectives on CBE, we asked the respondents to identify their role on campus. Forty percent of the respondents identified as a chief academic affairs officer (provost or vice president of learning), 29% of the respondents identified as institutional research or assessment, and 10% of the respondents identified as a dean. The remaining 21% of the respondents identified as presidents or chancellors, vice provost/provost's office staff, department chairs, faculty members, or other (see Figure 3).

Figure 3. Respondents' Roles on Campus



Defining CBE

Although considerable variation exists in the specifics of how CBE is defined in the field, at its core, CBE is characterized by two key features: (a) curricula that are designed around competencies, and (b) a model that allows time to vary, while holding expectations for learning constant.⁶ As in the 2018 NSPCBE, to acknowledge variation among CBE programs, the 2019 survey respondents were asked to answer a series of questions regarding their adoption of, or interest in, several elements associated with competency-based approaches. The elements (see sidebar) included in the definition were selected with input from the NSPCBE advisory board, balancing the interests in accounting for widely recognized key components of CBE and capturing the variety of program types that currently exist.⁷

To support analyses of adoption that may indicate an institution is “on the path” toward adopting a full CBE program, we also sought to capture information about the implementation of elements that did not meet the CBE definition threshold. This survey does not, however, attempt to include the full set of related approaches, termed “competency-based learning” approaches.⁸ We explore findings about this in the CBE Adoption section of this report.

We tailored the survey questions (using skip logic) depending on the institutions’ responses about their adoption or interest in CBE programs, and we present the results separately throughout this report where applicable to explore differences among those groups. Those institutions that reported no interest received a shorter survey focused on their perceptions about CBE and reasons for their lack of interest. Those institutions that reported interest but did not indicate in-progress adoption received a similar survey, with additional questions about reasons for their interest as well as barriers to moving toward adoption. Finally, those institutions that reported adoption or in-progress adoption of key elements received questions about whether they had adopted those approaches at the course level or for entire programs of study. Then they received a longer survey exploring the details of their adoption or planned adoption of CBE, including questions about the model of any existing programs.

How Is CBE Defined in the NSPCBE?

To be classified as a CBE program, an entire program must contain at least one of the following characteristics:

1. Learning is measured in competencies and either quantified without reference to seat time or mapped to measures of seat time.
2. Students advance from the course or complete the program based on mastering all required competencies.
3. Courses or programs offer flexible pacing.

⁷ In the 2019 NSPCBE, the definition was adjusted to reflect “flexible pacing” rather than “self-pacing” based on a recommendation from the advisory board.

⁸ Competency-based learning includes structured and unstructured opportunities for learning and/or the assessment of learning, both self-created and those designed by employers, education institutions, and training providers, which are aligned to competencies and may lead to a recognized education credential. These approaches may include military training, apprenticeships, workforce development programs, and other related opportunities.

Limitations

Because this survey is based on a survey of institutions, the findings are based on self-reported data from institutional leaders. As noted, this is particularly challenging in evolving areas because surveys rely on a common understanding of key terms or concepts. Nearly no terms associated with CBE, except for Direct Assessment approval, have common and established definitions. We advise readers to interpret these findings with these caveats in mind and caution that we have attempted to highlight areas we consider susceptible to differences in interpretation.



State of the Field: 2019

Of the 602 respondents, 51% reported being in the process of adopting CBE, 23% reported being interested in CBE but hadn't started adopting, and 15% expressed no interest (see Figure 4). This year, 11% — 64 institutions — reported current operation of at least one full CBE program; together, those institutions offered a total of 588 programs. Of these programs, 492 (84%) were undergraduate programs, and 96 (16%) were graduate programs (see Figure 5).

This represents an increase: last year, institutions reported 427 undergraduate programs and 85 graduate programs.

Figure 4. Institutions' Interest and Adoption Status

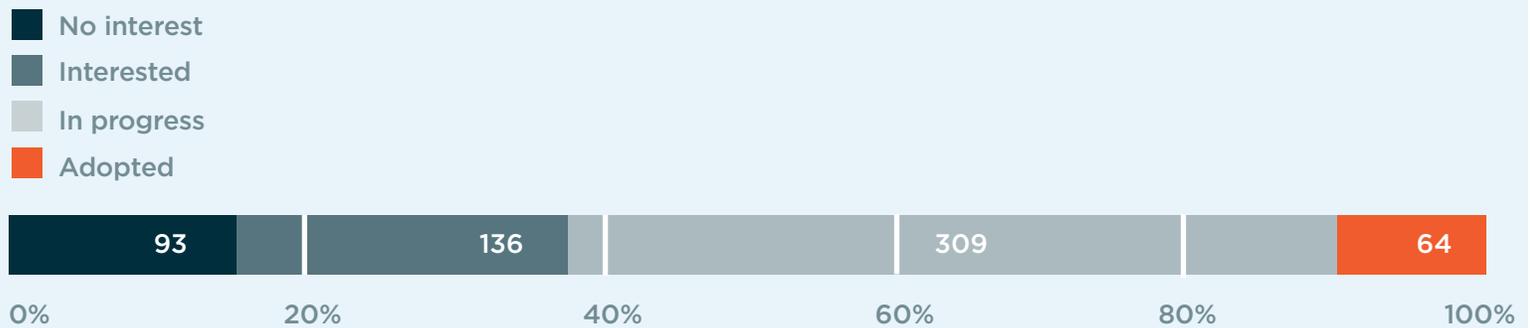


Figure 5. Undergraduate and Graduate CBE Program Offerings



CBE Adoption

This section explores trends in institutions' adoption of CBE, including what elements of CBE that institutions adopt, their stage of adoption, and motivations for adopting CBE. We update findings from 2018 and explore some additional questions that shed further light on potential adoption pathways, future ambitions that institutions have for CBE, and the types of institutions that adopt CBE.

The survey analyses focused on understanding the scope of, and motivations and goals for CBE adoption and identified several trends, which are largely consistent with previous years' findings:

- Adoption efforts at most institutions tend to fall short of a total CBE program; rather, institutions appear to choose elements that work for individual contexts and goals.
- Most institutions responding reported being at the planning stages. Among institutions that reported "in progress" implementation, the most common first steps were those that did not require much support outside academic units, such as competency and assessment development.
- Although the 2019 survey responses show limited and piecemeal adoption of CBE, it appears to be growing and is not limited to a single sector or institution type.
- Institutions still most commonly see CBE as a means to serve nontraditional students and support workforce readiness.
- Many institutions' future goals for CBE implementation may be related to using CBE as a tool for specific purposes, rather than scaling CBE as the primary institutional model.

Which Elements of CBE Are Institutions Adopting?

A key finding in the first administration of the NSPCBE was that many institutions reported course-level, rather than program-level, adoption, and many institutions adopt only some elements related to CBE. In 2019, this trend held steady: elements related to CBE but not independently meeting the threshold were more prevalent than elements meeting the threshold of CBE.

Although these elements do not indicate the use of CBE, we hypothesize that they may represent steps on the path toward CBE for some institutions, so we consider these elements as important to track. The most frequently reported element being used by institutions was developing clear definitions of competencies at the course level, with 56% of 4-year and 57% of 2-year institutions reporting this fact. Another common element was using prior learning assessment for awarding credit. Notably, this was much more common at 2-year institutions (53%) than at 4-year institutions (33%).⁹

However, almost half of the institutions have adopted at least one of the individual elements that met the threshold for CBE in our survey (see Figure 6):

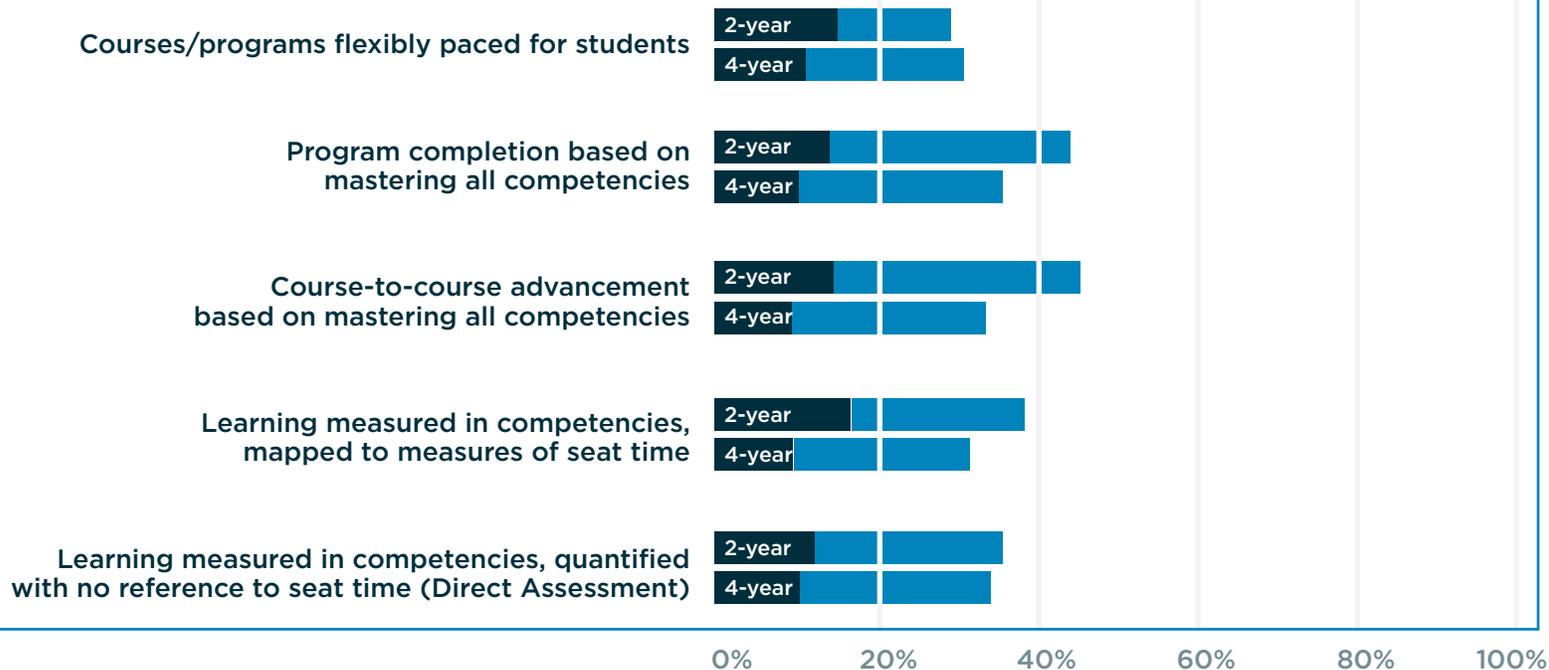
- Measuring learning in competencies, either quantified without reference to seat time or mapped to measures of seat time
- Requiring mastery of all required competencies for advancement between unit to unit or for program completion
- Allowing students flexible pacing in courses or programs

⁹ This difference is statistically significant.

Figure 6. Adoption Activity by Element

■ In Progress ■ Adopted

CBE Elements



Not Considered CBE Elements

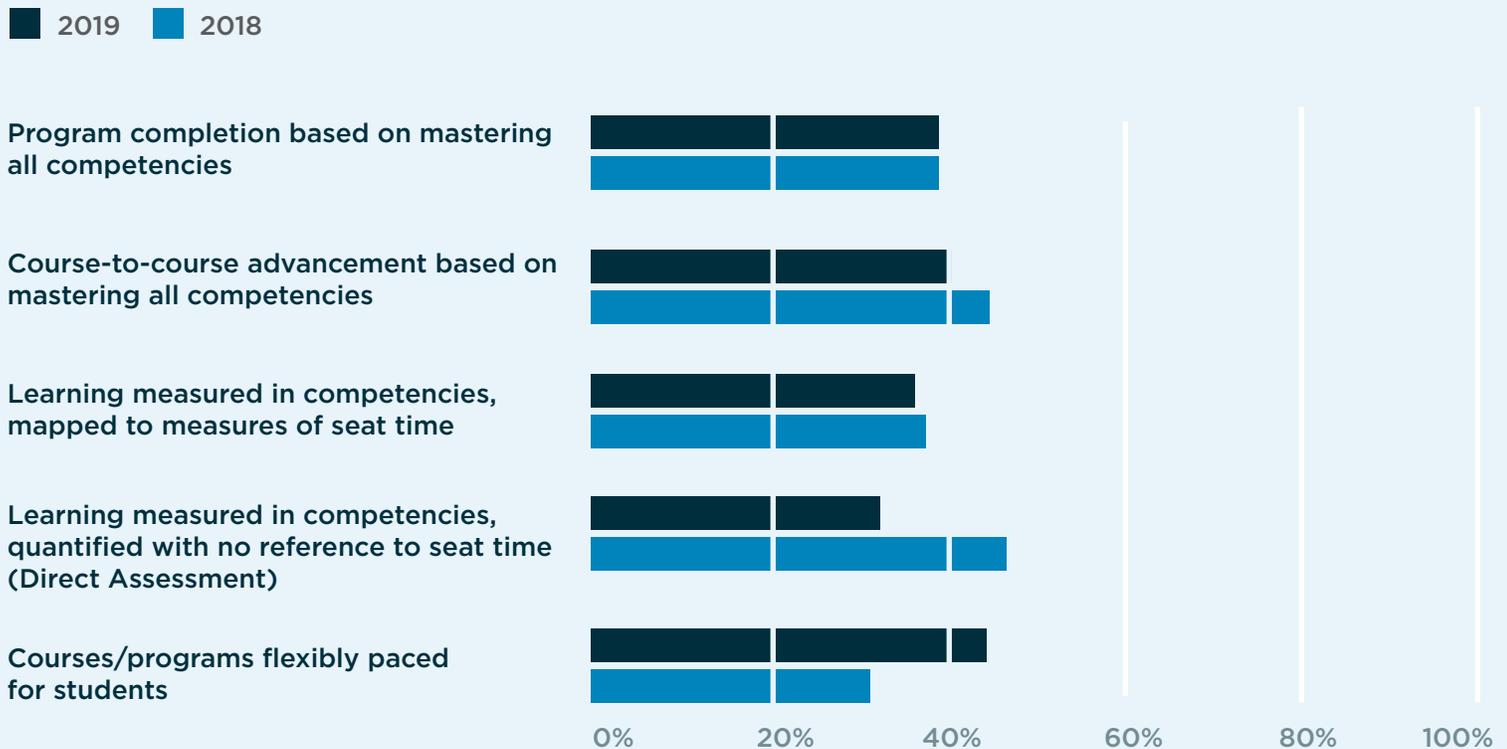




For the sample of institutions that responded in both 2018 and 2019, we observed minimal change in adoption levels; although some progress toward adoption occurred, some institutions had decreased their use of CBE elements (see Figure 7). For instance, the share of institutions reporting adoption in progress or adopted for flexible pacing increased by 13 percentage points (which may be caused, in part, by the change in language from self-paced last year). The share of institutions reporting adoption in progress or adopted for “learning measured in competencies quantified with no reference to seat time” (e.g., the Direct Assessment model¹⁰) decreased by about 12 percentage points. On

other elements that meet the definition of a CBE program, including program completion based on mastering all competencies, learning measured in competencies and mapped to measures of seat time, and course-to-course advancement based on mastering all competencies, change was marginal, with percentages similar to those observed in 2016 as well. Overall, we consider these changes potentially indicating a decrease in the share of programs planning to pursue Direct Assessment approval since last year among those institutions that responded to the survey in both years.

Figure 7. Share of Institutions Reporting In Progress or Adopted



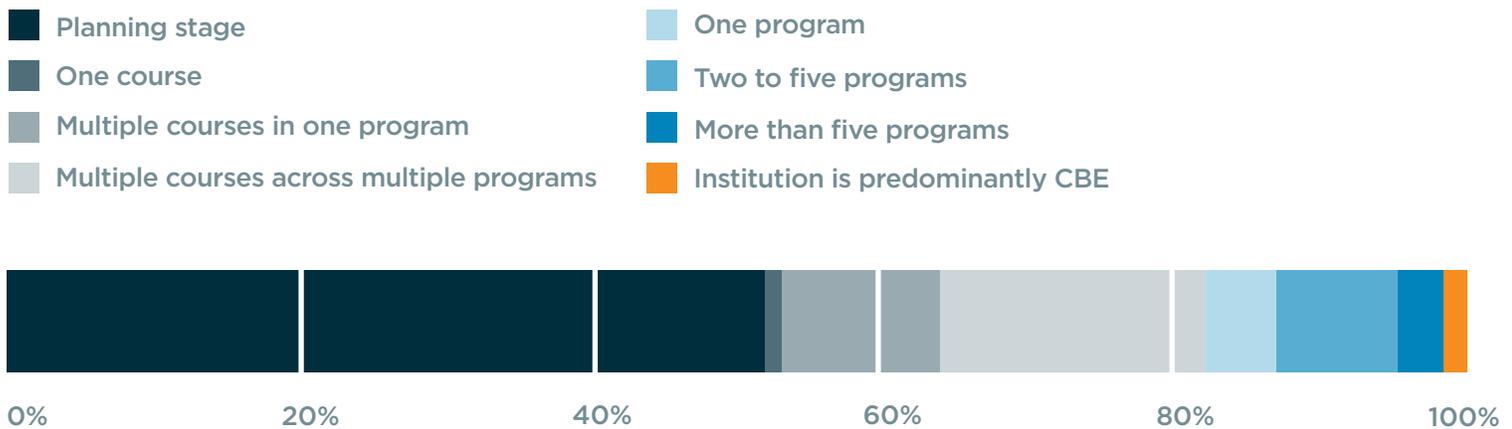
What Are the Stages of CBE Adoption?

As in 2018, we asked institutions to describe their stage of adoption if they indicated current or in-progress adoption of the various elements of CBE meeting our threshold. Figure 8 shows whether the institutions consider themselves in the planning stage for CBE, the course-level adoption stage (which may indicate experimentation that may lead to a program or may result in pulling back), or the program adoption stage. Consistent with trends identified last year, we found that most institutions (52%) reported being at the planning stage. About one third (30%) reported using competency-based approaches at the course level, with most of that group offering CBE across multiple courses in multiple programs. Approximately 18% of the institutions reported having at least one program compared with just 11% reporting program-level adoption in 2018.



Of those institutions that responded to the survey in both years, the findings reveal incremental growth in CBE programs and movement from planning stages to CBE offerings. For example, the share of institutions that reported being in the planning stages decreased by 6 percentage points from 2018 to 2019, whereas the share of institutions that reported offering one or more CBE programs increased by 9 percentage points. There also is some indication that institutions move in different directions between these phases, sometimes moving from course offerings to planning stages, for example.

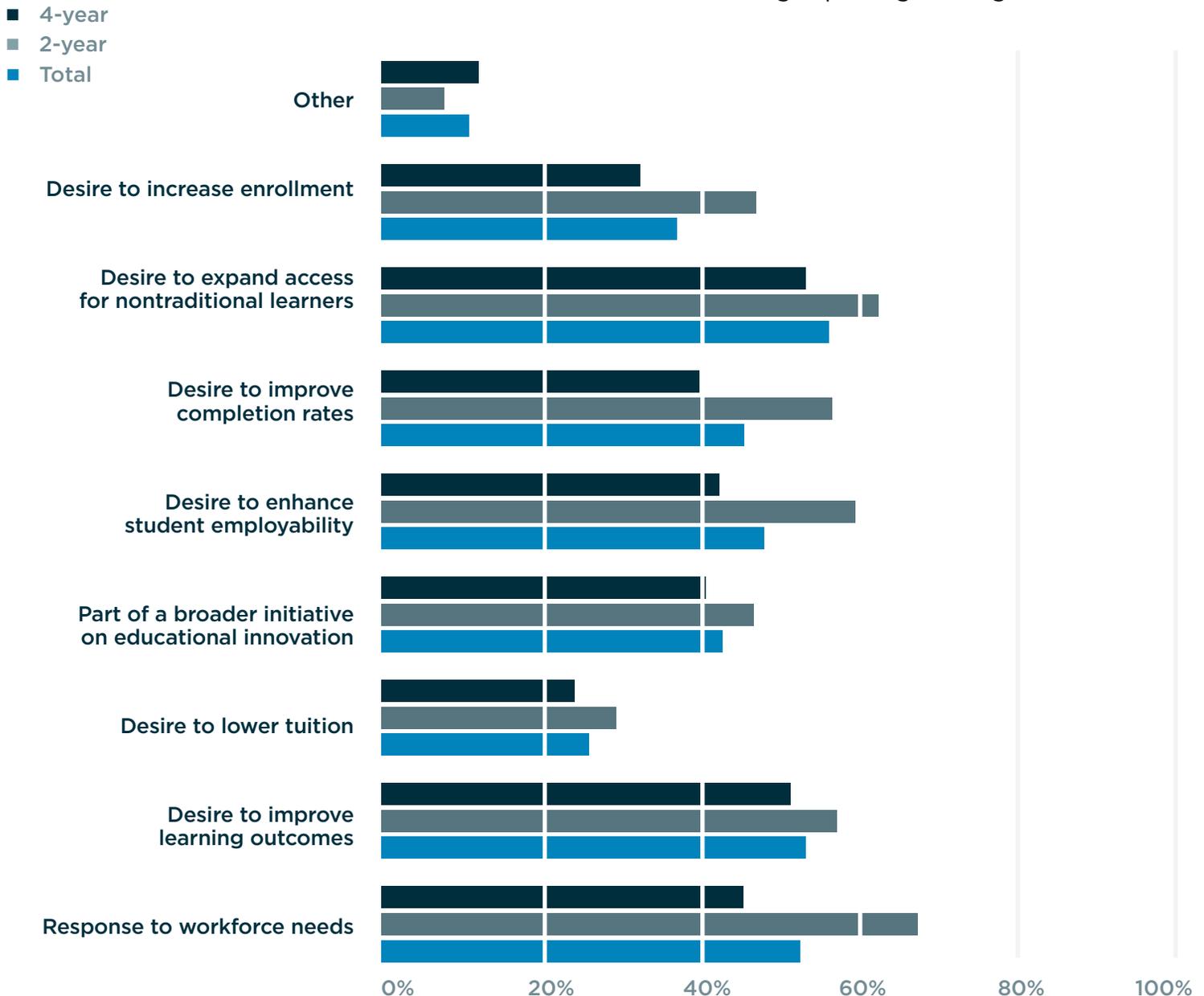
Figure 8. Stage of Adoption



What Are Institutions' Motivations for Adopting CBE?

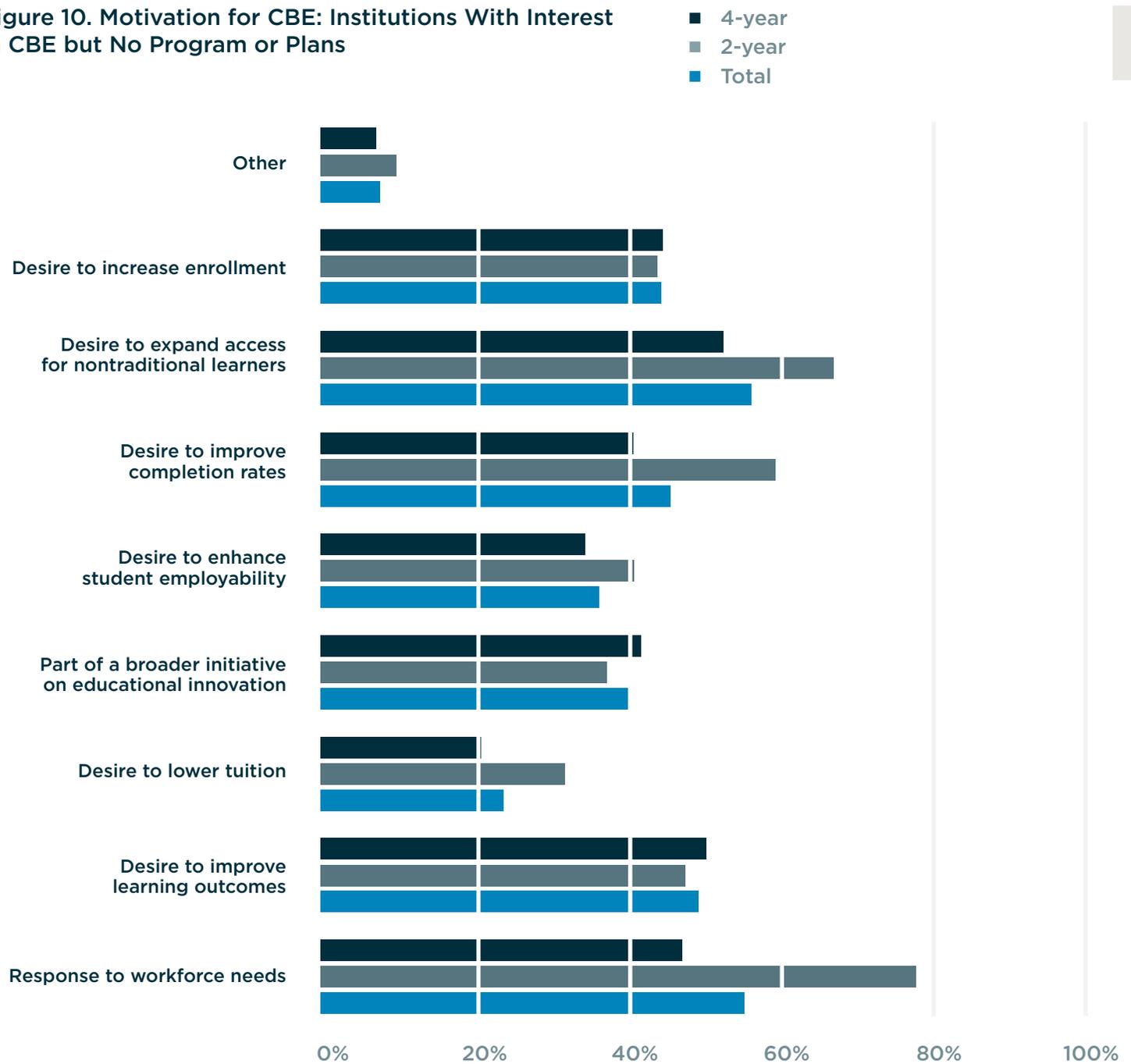
How institutions define the “problem” (or problems) they are trying to solve with CBE may ultimately influence the development of the field and the models of CBE adopted. A key finding in 2018 was that institutions adopting or interested in adopting CBE most commonly viewed it as an opportunity to serve nontraditional students and improve workforce readiness. This year, we again asked about a large set of common challenges often cited in higher education, asking the respondents to select all options that applied to their motivations for CBE.

Figure 9. Motivation for CBE: Institutions With a Program or Currently Adopting



Broadly, we found that the most common motivations reported last year remain largely consistent. Of institutions that reported having a program or being in the process of adopting (see Figure 9), expanding access for nontraditional students (57%) and responding to workforce needs (53%) again topped the list as common motivations for implementing CBE. In addition, this group also selected the “desire to improve learning outcomes” as a top response (54%) this year. Institutions that reported interest in CBE (but no adoption) reported the same top motivations (see Figure 10), with 57% of the institutions citing expanding access for nontraditional students, 55% of the institutions citing responding to workforce needs, and 50% of the institutions citing improving learning outcomes.

Figure 10. Motivation for CBE: Institutions With Interest in CBE but No Program or Plans



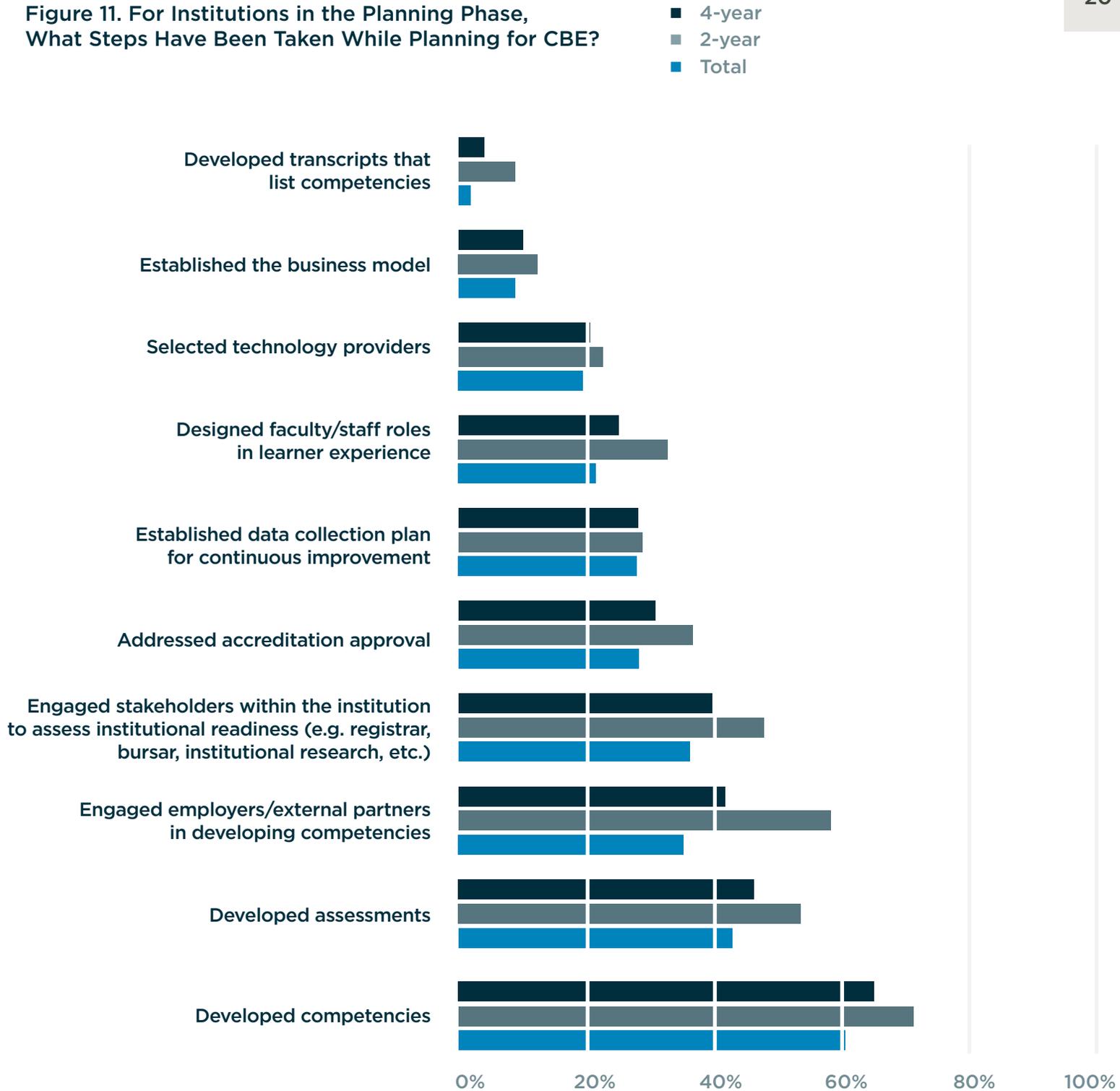
New in 2019: What Are the Different Pathways to CBE Adoption?

To better understand the finding in 2018 that adoption by many programs was best characterized as in progress and shed light on potential adoption pathways, we added a question in 2019 asking which specific steps institutions took during their planning phase (see Figure 11).¹¹ Overall, less than half of the institutions in the in progress category in 2018 reported progress on any individual step except developing competencies in 2019. Some other activities that might occur during a consideration phase, such as gaining early buy-in or studying other CBE programs, are not captured in this survey.

In general, the most commonly accomplished steps involved developing competencies (65%), developing assessments (46%), and engaging external employers/partners in developing competencies (42%)—all of which require only the involvement of that academic unit (and possibly existing or new employer advisory committees) rather than a support/business unit on campus. The next most common step involved engaging stakeholders within the institution to assess readiness, and many of the remaining options require effort or a process change by another unit or function on campus. We cannot assume that the order of selection in this survey represents a step-by-step guide or ideal order; it's entirely possible (and perhaps likely) that some of these steps are connected, and some may be iterative. However, Figure 11 suggests early indications of the broad direction of these steps.

¹¹ This question was added with the guidance of the advisory board and was broadly based on the Competency-Based Education Network quality standards.

Figure 11. For Institutions in the Planning Phase, What Steps Have Been Taken While Planning for CBE?

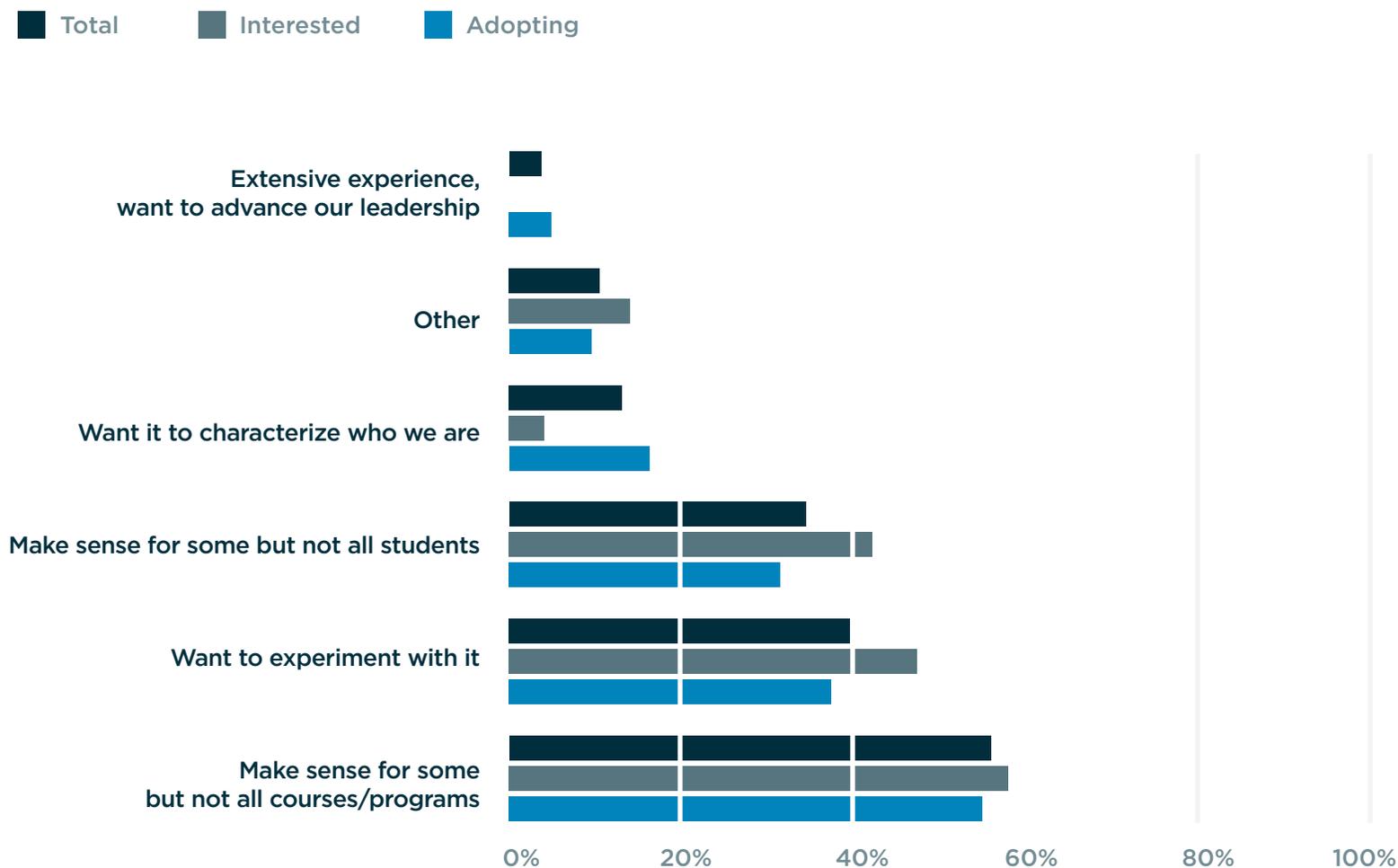


New in 2019: What Are Institutions' Ambitions for Using Competency-Based Approaches and Full CBE Programs?

To understand institutions' aspirations and goals for using CBE and recognizing that not all may want to be fully engaged in CBE, we asked institutions about their stance on competency-based approaches, looking at those interested in CBE versus those that reported being in the process of adopting a CBE program.

Figure 12 shows that a slight majority of both groups believe it “makes sense for some but not all courses/programs.” Similarly, both groups rated “want to experiment with it” and “make sense for some but not all students” among the second and third highest rated options. Very few institutions reported having extensive experience and wanting to advance their leadership; relatively few wanted it to “characterize who we are.” Generally, these findings suggest that many institutions are using CBE and its related elements as a tool for specific purposes, rather than the primary way of operating in the future.

Figure 12. Which of the Following Best Describes Your Institution's Stance on Competency-Based Approaches?



New in 2019: What Types of Institutions are Using CBE?

Having identified trends in adoption and motivation, we now turn to several new questions that shed light on CBE adoption and interest. Broadly, we see institutions in nearly every category adopting CBE: ranging from rural community colleges to R1 universities and minority-serving institutions such as Historically Black Colleges and Universities and Tribal colleges.¹² We sought to understand what types of institutions are more likely to have CBE programs or be exploring CBE programs, plus how and whether institutions' ambitions with CBE vary by the type of institution.

What Types of Institutions Have CBE Programs or Are in Progress?

Of the institutions with CBE programs (slightly more than 10% of the institutions), most are at 4-year institutions (73%), with only 24% of the institutions being 2-year institutions. The 4-year institutions are split relatively evenly between public (25%), private nonprofit (24%), and private for-profit (24%) institutions (see Figure 13).

A different question involves whether some types of institutions are more likely to have CBE than other types, based on their total share of the population of institutions. Figure 14 shows that of the public 4-year institutions, 10% of them have a full CBE program, and 55% of them consider themselves in progress. Only 6% of the public 2-year institutions have an operating CBE program, but 62% of those institutions report being in progress. Broadly speaking, private nonprofit 4-year institutions are the most likely to report no interest in CBE. Taken together, these findings suggest that, at a minimum, CBE can launch in any sector, and it is not necessarily limited to a particular type of institution.

Figure 13. Distribution of Institution Type, of Institutions With a CBE Program

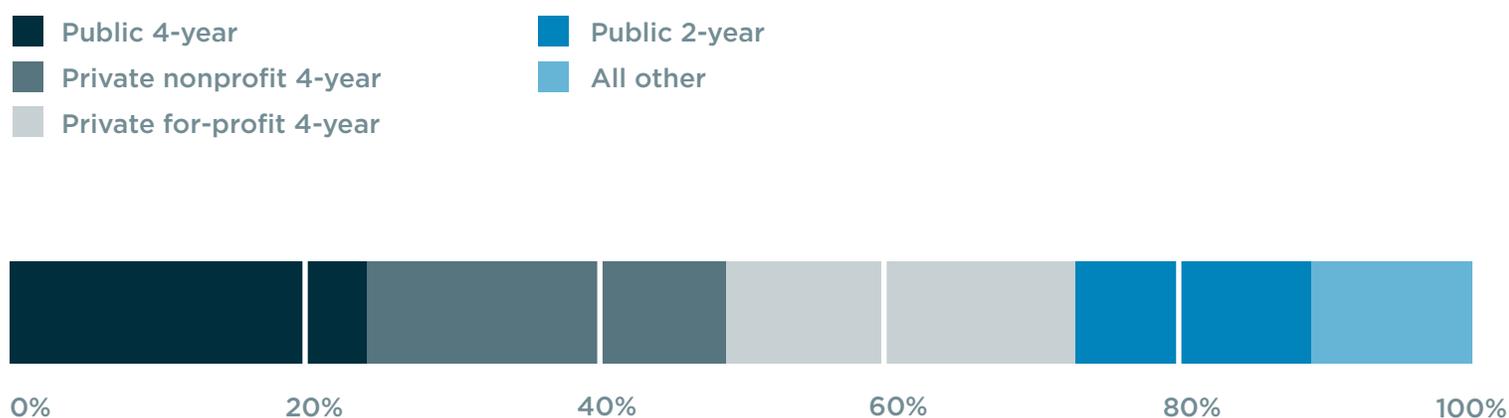
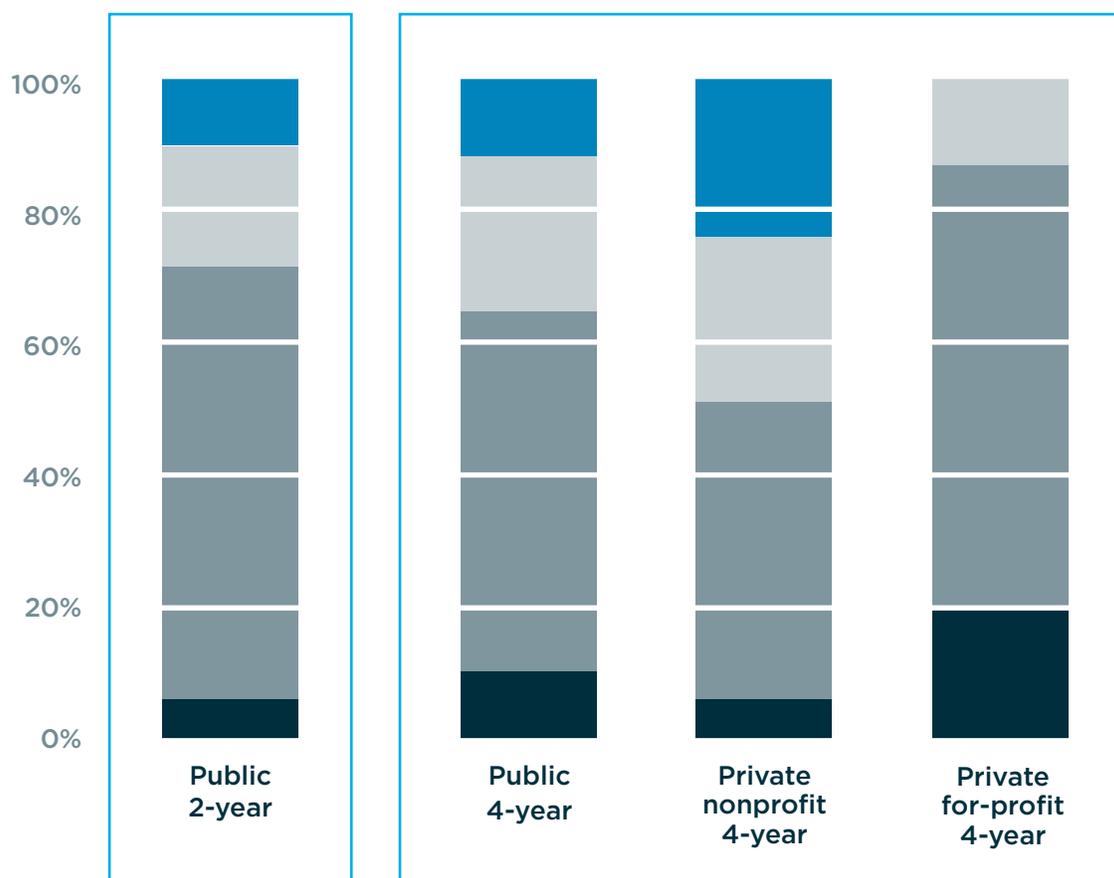


Figure 14. Adoption and Interest in CBE, by Institution Type



CBE Adoption: Key Findings in 2019

CBE adoption efforts span all institution types, and we see indications of growth in the number of programs; however, much adoption activity remains piecemeal, with many institutions adopting some but not all elements of CBE. Most institutions consider CBE as a tool for advancing specific institutional goals, rather than the primary mode of operation for the institution.

CBE Programs

24

Providing a look at the landscape of full CBE programs that exist—and how institutions are choosing to implement them—is an important goal of this survey. In this section, we revisit questions from 2018 about student enrollment and the role of faculty, and we explore new topics, such as the modality of CBE programs and the most common fields of study:

- Institutions offering CBE programs use a variety of modalities (online-only, face-to-face, and hybrid or blended offerings), with no one modality representing a majority.
- Most CBE programs are still serving relatively small numbers of students, with more than half of the institutions reporting programs with fewer than 50 students.
- The most commonly offered CBE disciplines—nursing and health professions and business administration—are consistent with trends in degrees awarded nationwide.
- As in previous years, faculty fulfill a broad range of roles in CBE programs.

New in 2019: Are CBE Programs Offered Online or Face-to-Face?

A common question about CBE is whether it is synonymous with online or distance education. To understand the share of institutions offering CBE programs entirely online, hybrid or blended, or face-to-face, we asked institutions with CBE programs to report the mode of delivery.

In contrast with any assumption that CBE is equivalent to online coursework, only 37% of the institutions with a CBE program reported that their programs are entirely online; the hybrid

or blended modality represents another 26% of these institutions (Figure 15). Entirely face-to-face represented 19% of the institutions with CBE programs, whereas predominantly face-to-face, with online assignments, represented 18% of the institutions. In this case, it is important to note that these figures are based on institutions with CBE programs rather than individual CBE programs; the survey did not ask respondents to report the modality separately for each CBE program.¹³

Figure 15. CBE Program Modality

- CBE courses accessed entirely online.
- CBE courses accessed in a hybrid or blended modality.
- CBE courses are predominately face-to-face, with online assignments.
- CBE courses are entirely face-to-face.



¹³ We anticipate that it is rare for institutions to offer CBE programs in different modalities; if that is the case, the available options likely led them to select “hybrid or blended modality,” so the results should be interpreted with this consideration in mind.

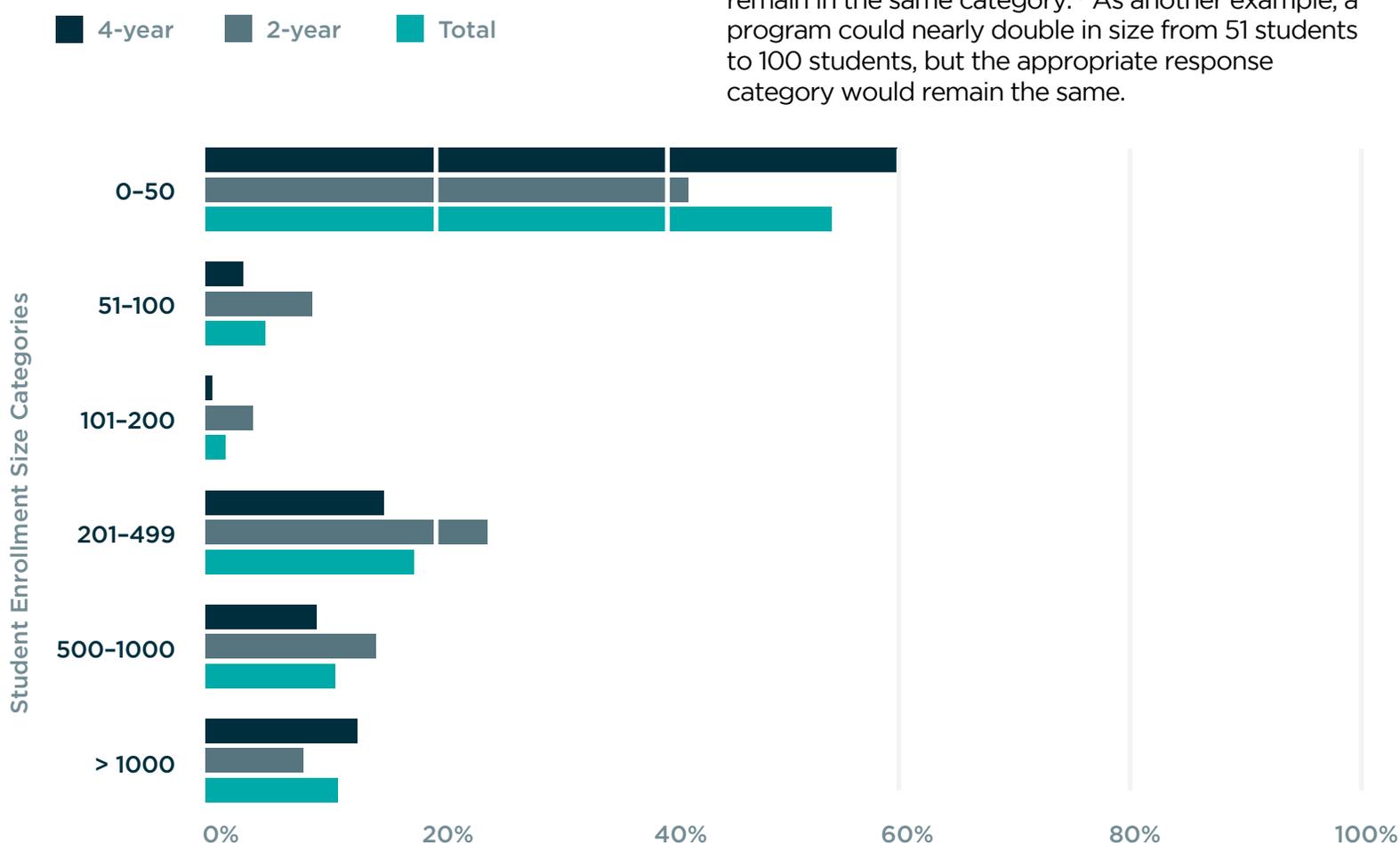
What Is the Scale of Enrollment in Existing CBE Programs?

To understand the potential impact of the implementation and scale of individual CBE programs in terms of the students served, we asked institutions with full CBE programs to share recent estimates of student enrollment in their programs. Consistent with the 2018 findings, most undergraduate programs are still small, with 53% of the institutions reporting enrollment of fewer than 50 students in the last academic year (Figure 16).¹⁴ At the other end of the spectrum, 11% of the programs had undergraduate student enrollment of more than 1,000 students, demonstrating

the potential for institutions to scale their CBE programs, if desired. These trends are consistent across both 2- and 4-year institutions, with 2-year institutions enrolling slightly higher numbers of students. This survey does not necessarily explain why many programs are relatively small; potential causes range from low student demand to a lack of supporting technology and internal business processes or simply no interest from the institution in further growing the program.

Of those institutions that responded in 2018 and 2019, we observed very little movement between categories in student enrollment in CBE programs. It is worth noting, however, that some change may have occurred but was not captured by the provided response options. For example, if a program increased enrollment from 250 to 350, it would remain in the same category.¹⁵ As another example, a program could nearly double in size from 51 students to 100 students, but the appropriate response category would remain the same.

Figure 16. Reported Undergraduate Enrollment in Active CBE Programs: Share of 4-Year and 2-Year Institutions in Enrollment Size Categories



¹⁴ The number of institutions with graduate programs is small enough that we do not include that distribution here; these charts would require extreme caution in interpretation.

¹⁵ We chose to use ranges as the response options rather than asking respondents to report integers because we had low confidence that most respondents would be prepared to report accurate, precise numbers. In such scenarios, open-ended questions often result in response heaping (Gideon, Helppie-McFall, & Hsu, 2017); that is, the overreporting of estimated round numbers (e.g., 100 rather than 112).

New in 2019: In What Disciplines and at What Levels Are CBE Programs Offered?

A common question asked about CBE is whether it is more appropriate for particular disciplines or fields. Therefore, the survey asked institutions to report which levels of certificates or degrees they offered and, separately, the disciplines or fields for the CBE programs. Of institutions with CBE programs, more than half of the institutions offered at least one CBE bachelor's degree program (57%) or a CBE certificate program (51%). Two-fifths of the institutions (40%) offered a CBE associate's degree program. Less than one-tenth reported providing noncredit courses via CBE.¹⁶ At the undergraduate level, the most common disciplines that institutions with CBE programs reported are nursing and health professions (42% of the institutions with a CBE program reported having one in this discipline), computer and information sciences (35%), and business administration (34%).

Although national data about each degree level are not available, we examined bachelor's degree fields nationally and found that CBE program fields align with the most common fields nationwide for degrees conferred. For example, business and nursing and health professions are the top two most commonly awarded bachelor's degrees nationally (ED, 2017). Computer and information sciences do not fall in the top five fields in which institutions reported offering bachelor's degrees, but it has been among the top three fastest growing fields since 2010. Therefore, it may be inappropriate to conclude that certain fields are a better fit for CBE; the fact that more CBE programs are in particular fields may simply reflect the greater demand for programs in those fields.¹⁷ Finally, additional programs reported by institutions under the "Other, please specify" option included some newer disciplines, such as advanced manufacturing and unmanned aerial systems. Such responses may suggest that CBE may be well suited for new programs, where institutions can build a program in CBE from the outset, rather than converting an existing program.

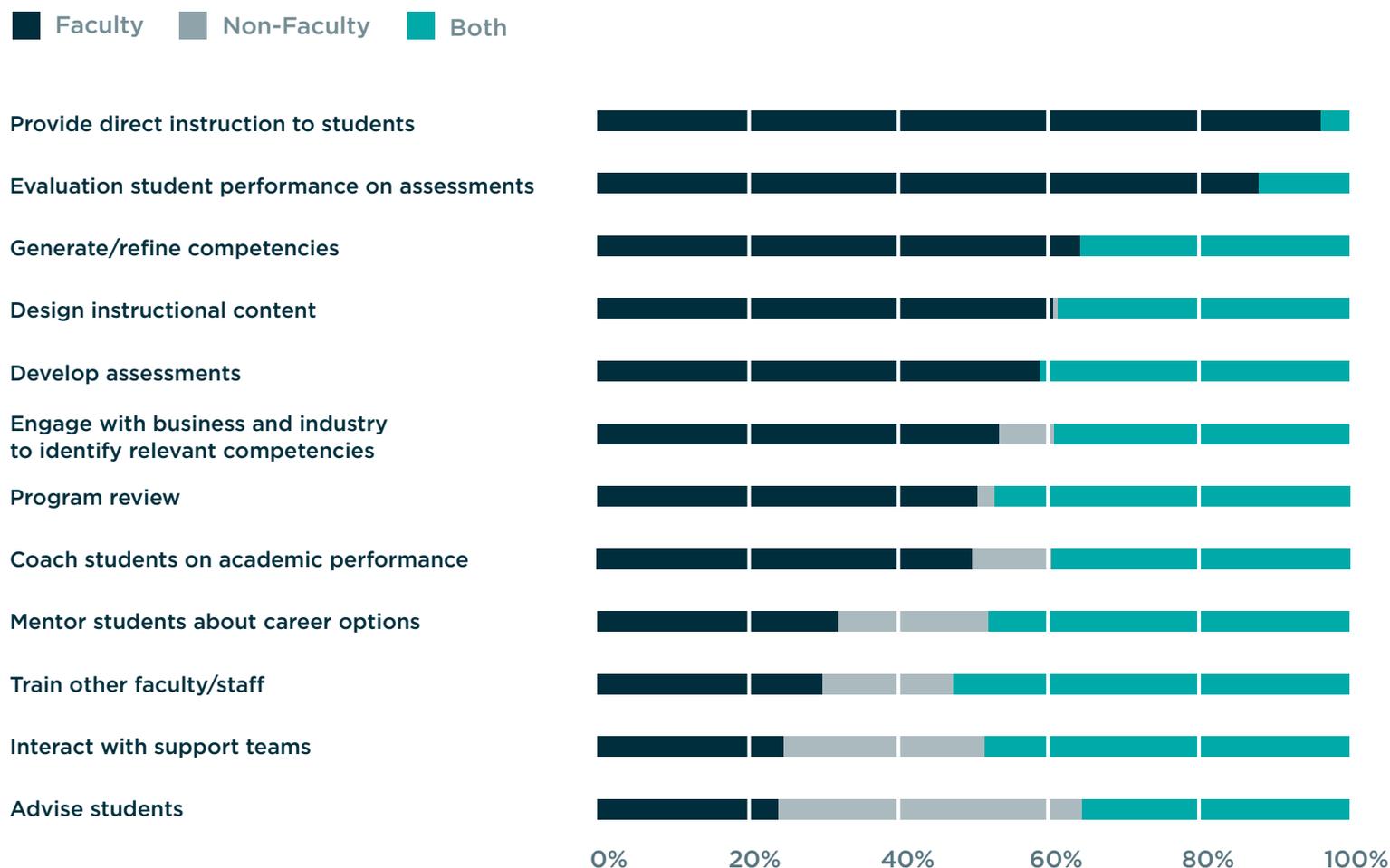
¹⁶ Institutions that offer multiple programs selected both degree levels, so it may be incorrect to conclude that bachelor's degrees are the most common degrees. Instead, the smaller number of institutions offering associate's degrees may offer many more of those degrees per institution, which would make this level the most common CBE program level.

¹⁷ This section focuses on undergraduate CBE programs. The number of institutions offering graduate CBE programs is sufficiently small, so we cannot report on those findings without advising extreme caution in interpreting the numbers.

What Are the Faculty and Staff Roles in CBE Programs?

Because of the continued importance of understanding how to best structure faculty roles to support student learning, plus ED's focus on monitoring contact between faculty and students through the "regular and substantive" regulation, the survey again asked institutions to report on the types of roles that faculty and staff fulfilled in CBE programs (Figure 17). As in earlier administrations of this survey, we continue to see that faculty are fulfilling a wide range of roles in CBE programs. Broadly, the most common roles for faculty are content-driven roles, such as direct instruction (96%), student performance evaluation on assessments (88%), and competency development (64%), whereas nonfaculty staff more often fill advising and related student support roles.

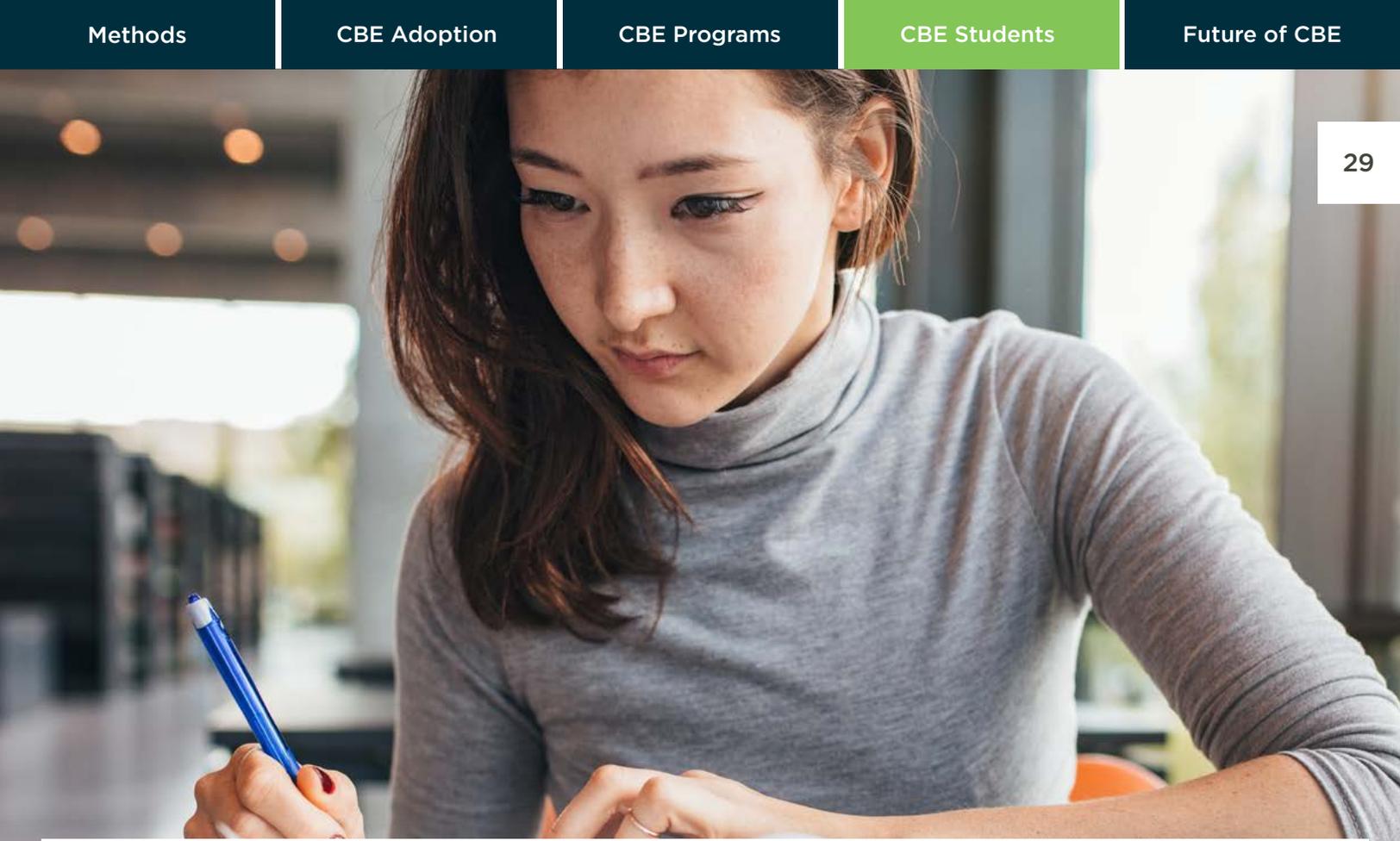
Figure 17. Faculty and Staff Roles in CBE Programs





CBE Programs: Key Findings in 2019

Most CBE programs are being offered in a variety of modalities and are currently serving relatively small numbers of students. The top disciplines offered are consistent with the top-enrolling disciplines nationwide, and faculty still fulfill a broad range of roles.



New in 2019: CBE Students

We recognized that a key gap in our survey last year was information on students participating in CBE. Although our survey is still of institutions, this year we sought to ask a limited set of questions about the students in their CBE programs. We focus broadly on questions related to the “iron triangle,”¹⁸ representing the value propositions of higher education because CBE has been proposed as an opportunity to “break” the iron triangle by improving access, cost, and quality simultaneously (Bushway, Dodge, & Long, 2018).

The 2019 NSPCBE sought to dig deeper on several student-focused questions related to CBE programs. Though still limited, the findings suggest the following:

- Compared with traditional programs, CBE programs are serving more students with prior credits. Across other key subgroups, trends are less clear.
- The majority of programs qualify for federal student aid (FSA), and most institutions report that the cost to students for CBE programs is the same as, or potentially less than, the cost to students in traditional programs.

Given the limitations of survey research—especially surveys of institutions—in answering these questions about students, further research is needed to better understand the student experience, especially as it relates to quality.

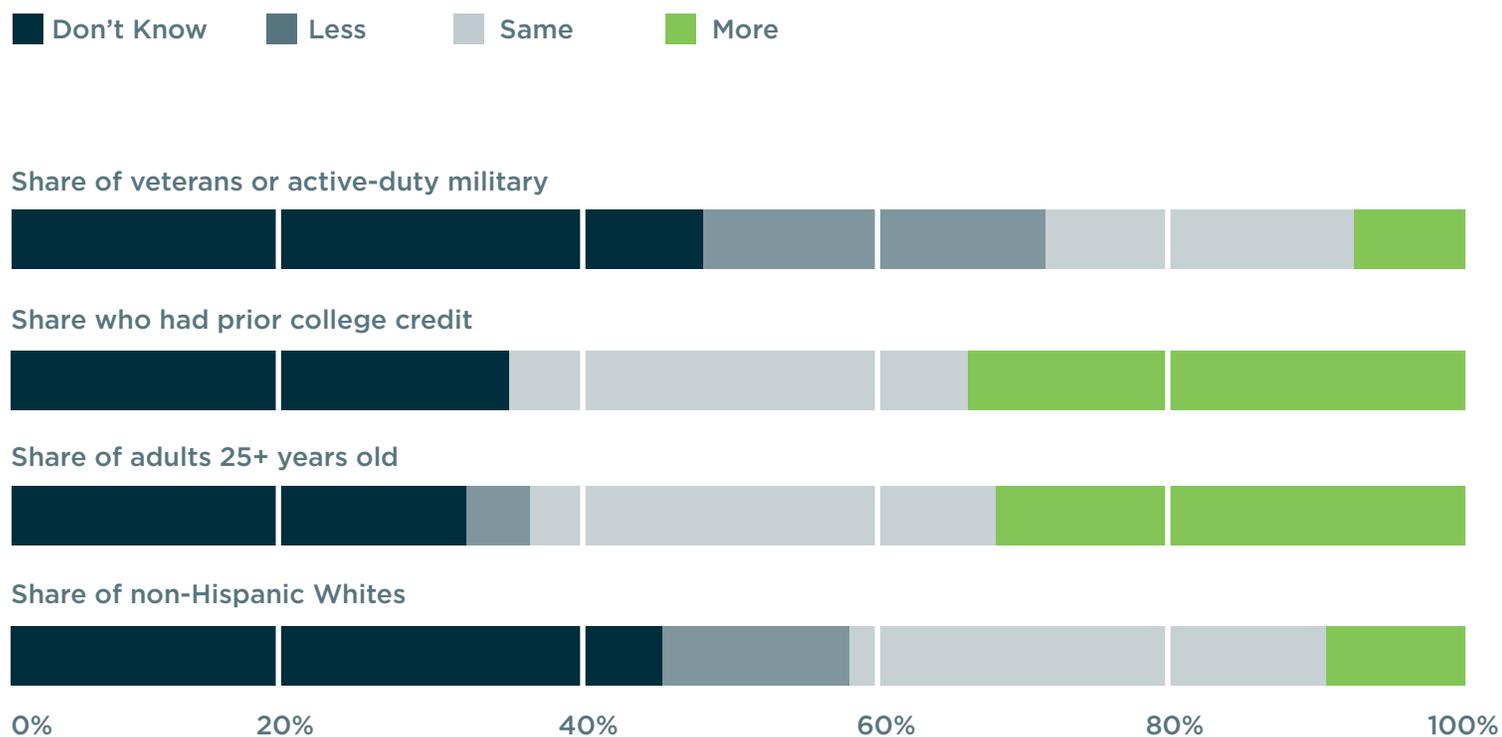
¹⁸ The iron triangle of higher education often refers to the challenges that institutions face in increasing quality, access, and affordability.

Who Enrolls in CBE?

Another key goal often associated with CBE is expanding access and improving equity. As reported earlier, many institutions see CBE as an opportunity to expand access for nontraditional (or new traditional) students.¹⁹ To better understand how students in undergraduate CBE programs compare with students in traditional programs—and whether CBE contributes to equity—we asked institutions with CBE programs to compare students in their CBE programs with students in their traditional programs in terms of age, race/ethnicity, and prior experiences.

Providing data on this point is challenging because a large share of institutions reported that they did not know that information for their programs. Of those institutions that did know, “same” was the top response for all questions except for the share of students who had prior college credit. On that dimension, CBE programs were more likely to report that they had more students with prior credits in their CBE programs than in the traditional programs at the same institution (Figure 18).

Figure 18. How Students in Undergraduate CBE Programs Compare With Students in Traditional Programs at Those Institutions



¹⁹ As noted in footnote 2, this report uses “nontraditional” students to refer broadly to student populations that are older than students coming directly from high school (typically age 25 or older), in line with the description provided by the National Center for Education Statistics at <https://nces.ed.gov/pubs/web/97578e.asp>. These populations are referred to as “new traditional” or “today’s students” as well, reflecting the fact that they are now the majority population participating in postsecondary education.

What Price Do Students Incur in CBE Programs?

CBE programs often are touted as an opportunity to improve affordability, particularly if they lower the costs of delivering education, which can then be passed on to students. To better understand whether this situation is the case, we asked institutions two questions about their CBE programs: whether their CBE programs were eligible for federal financial aid, and how the price of their CBE programs compared with the price of their traditional programs.

The majority of institutions with CBE programs (77%) reported that they were indeed eligible for federal financial aid, meaning that students in these programs can access critical support, such as Pell Grants and federal student loans. Of those eligible, most institutions (76%) are maintaining eligibility by using course-based CBE, which maintains a connection to credit hours and courses (see Figure 19). A relatively small share of institutions (18%) reported receiving approval for Direct Assessment by ED, and 6% selected “Other.”²⁰

Figure 19. Federal Financial Aid Eligibility at Our Institution

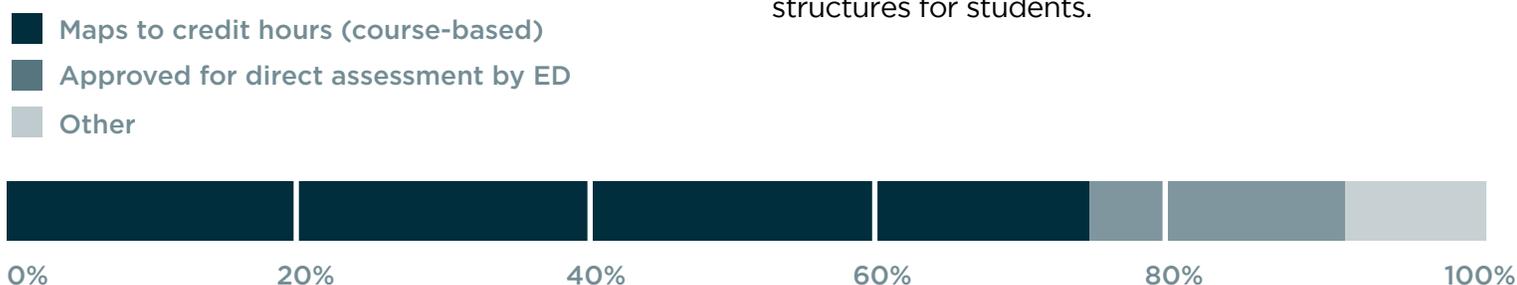
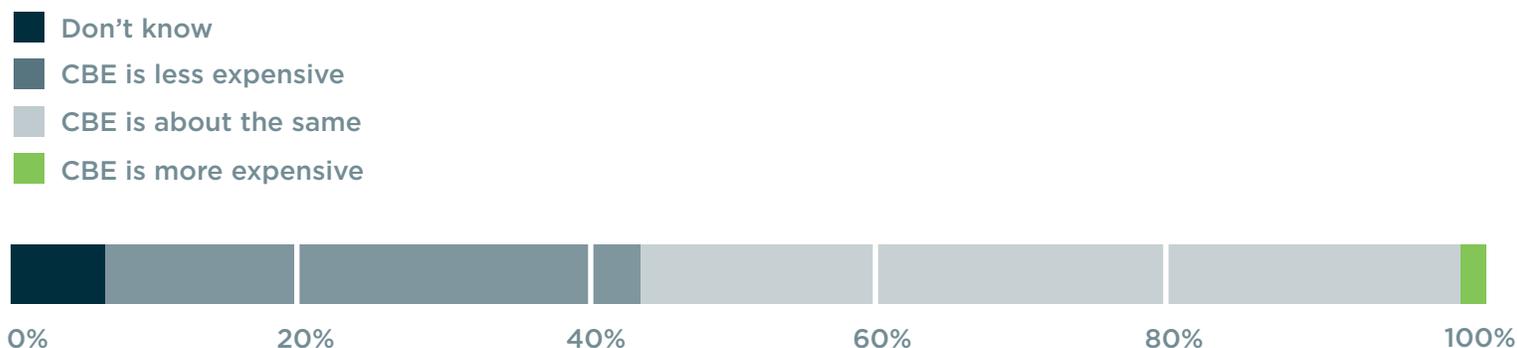


Figure 20. Comparing CBE Programs to Traditional Programs on Price



We then asked about how the price of their CBE program(s) compared with the price of their traditional programs. More than half of the institutions (56%) reported that the price of their CBE program was “about the same,” whereas 37% of the institutions reported that their CBE program was less expensive to students than their traditional programs. Generally, this finding may suggest that CBE programs are, in some cases, more “affordable” for students; however, we recommend interpreting this response with caution because some CBE programs use various models of subscription pricing, so the total price to students varies by student and depends on how quickly students advance through and complete the program. In those cases, for example, the program may be priced such that the CBE program is cheaper if a student advances more quickly toward completion; but for students who choose to take more time, it may ultimately be more expensive (Figure 20).

Ultimately, answering the question about whether CBE improves affordability—and, more importantly, for whom—will require tracking and analyzing the actual costs to real students across time, paired with deeper analyses of institutions’ pricing structures for students.

²⁰ Those selecting “Other” typically wrote in the supporting text field that they were part of Experimental Sites initiatives or had multiple programs in different categories.

How Do CBE Programs Affect Academic Quality and Completion?

Quality is a common value proposition of CBE because (a) it might improve completion rates and (b) those who complete the program will have evidence that they have demonstrated each competency required by the program. Research about this topic will be critical to understanding whether CBE fulfills this value proposition; unfortunately, this survey is not an ideal tool for exploring these themes. We asked institutions about the approximate number of students who have completed their programs, but relatively few programs have enrolled a sufficient number

of students and have existed long enough for students to have completed for us to report on this usefully. Future research focused on examining students' outcomes in traditional and CBE programs will better contribute to our understanding of whether CBE programs are fulfilling the job to improve quality. In addition, research about how and whether employers value the demonstration of competencies in CBE programs will continue to advance conversations about quality and the validation of programs in the labor market.



CBE Students: Key Findings in 2019

More research is needed, but early indications suggest that CBE programs often serve a greater proportion of students with prior credits than traditional programs, and institutions price their CBE programs so that the amount students pay may be similar to or lower than for traditional programs.

Barriers, Facilitators, and the Future of CBE

Understanding how CBE is perceived by a range of institutions with differing levels of implementation and interest in implementation is important to understanding how CBE might be appropriately scaled. To that end, this section explores perceived barriers to CBE implementation and optimism about CBE's future, topics that also were explored in 2018.

The survey findings in 2019 show trends similar to those we identified in 2018:

- Institutions, regardless of adoption or institution type, perceive substantial barriers to CBE implementation.
- Specific barriers vary across institution type and adoption level, and they are both internal (e.g., institutional business processes) and external (e.g., federal financial aid regulations) to the institutions.
- Despite barriers, the majority of institutions remain optimistic about the potential for growth in the number of CBE programs nationwide in the next 5 years, regardless of their own adoption or interest.
- More than half of the institutions with full CBE programs expect that the number of programs at their institution will increase in the next 5 years.

What Are the Barriers to Implementing CBE?

Institutions or policymakers considering implementing or providing incentives for expanding CBE often express interest in the barriers that they may need to plan for or address along the way. To that end, the survey asked institutions about factors that either serve as barriers hindering adoption or interest in CBE or factors that help adoption or interest in CBE. The findings in 2019 were generally consistent with the barriers identified by institutions participating in the 2018 NSPCBE.

For those adopting CBE, the most commonly selected barriers (combining “somewhat” and “significant” barriers) were similar to the responses to last year's survey: program start-up costs, FSA regulations and processes, other priority initiatives, and business systems and processes (Figure 21). Although faculty perceptions of CBE were not among that list, they are near the top of the list of factors selected as significantly hindering adoption.

Again, this suggests that internal (start-up costs, other priorities, business systems, and faculty perceptions) and external (FSA regulations and processes) barriers might have to be navigated by an individual department or a whole institution. On the opposite end, the factors most commonly reported to have helped implementation are broadly aligned with the motivations cited for considering CBE (see CBE Adoption section): ability to align competencies to industry standards (particularly among 2-year institutions), senior administrators' perceptions of fit and support of leadership, and evidence about student outcomes. Finally, we note that a sizable share of institutions—particularly 4-year institutions—selected “Don't know” for several factors, which may indicate that the respondent considered the factor neutral, did not know what the text referred to, or had not encountered or analyzed the issue yet.

For institutions with interest in CBE, the picture reflects a stronger focus on internal issues (Figure 22). The top barriers were entirely internal to the institution: other priority initiatives, on-campus expertise about CBE, internal business systems and processes, and program start-up costs. We note that on-campus expertise, much like 2018, is a key difference between this group and those adopting: “On-campus expertise” was among the top responses serving as a significant barrier for this group.

The factors most commonly cited as helping interest included evidence about potential to impact outcomes for students, the ability to align to industry standards, and the support of the institution’s leadership. Again, we see a sizable share of respondents selecting “Don’t know” for many of the factors, which again may suggest neutrality, confusion, or not yet encountering or analyzing the issue.

For example, the high share of “Don’t know” responses to student demand, employer demand, and FSA regulations and processes may be related to institutions not yet analyzing demand or implications.

Finally, institutions that indicated having no interest in CBE reported a mix of internal and external barriers to their interest in CBE (Figure 23). The top responses included other priority initiatives, accreditors’ regulations and processes, senior administrators’ perceptions of fit, and on-campus expertise about CBE were the top-reported barriers to their interest. Again, “Don’t know” responses were high for some factors, including the ability to align industry standards, and evidence about cost and outcomes.

The patterns we observe in this section are consistent with some of the patterns identified in institutions’ pathways to adopting CBE (see CBE Adoption section). Broadly, it’s clear that even among institutions with interest or plans, CBE is competing for attention and resources against other priority initiatives on campus. Among those institutions that reported being in the planning phase, other top-cited barriers are entirely internal: on-campus expertise about CBE, business processes, and program start-up costs. Each barrier, to different degrees, overlaps with some of the least commonly addressed planning steps, including establishing a business model and a data collection plan and assessing readiness with internal stakeholders.

Figure 21. Extent to Which Factors Have Helped or Hindered Adoption, Among Those Who Have Adopted CBE or Are In Progress

■ Significantly hindered ■ Somewhat helped
■ Somewhat hindered ■ Significantly helped

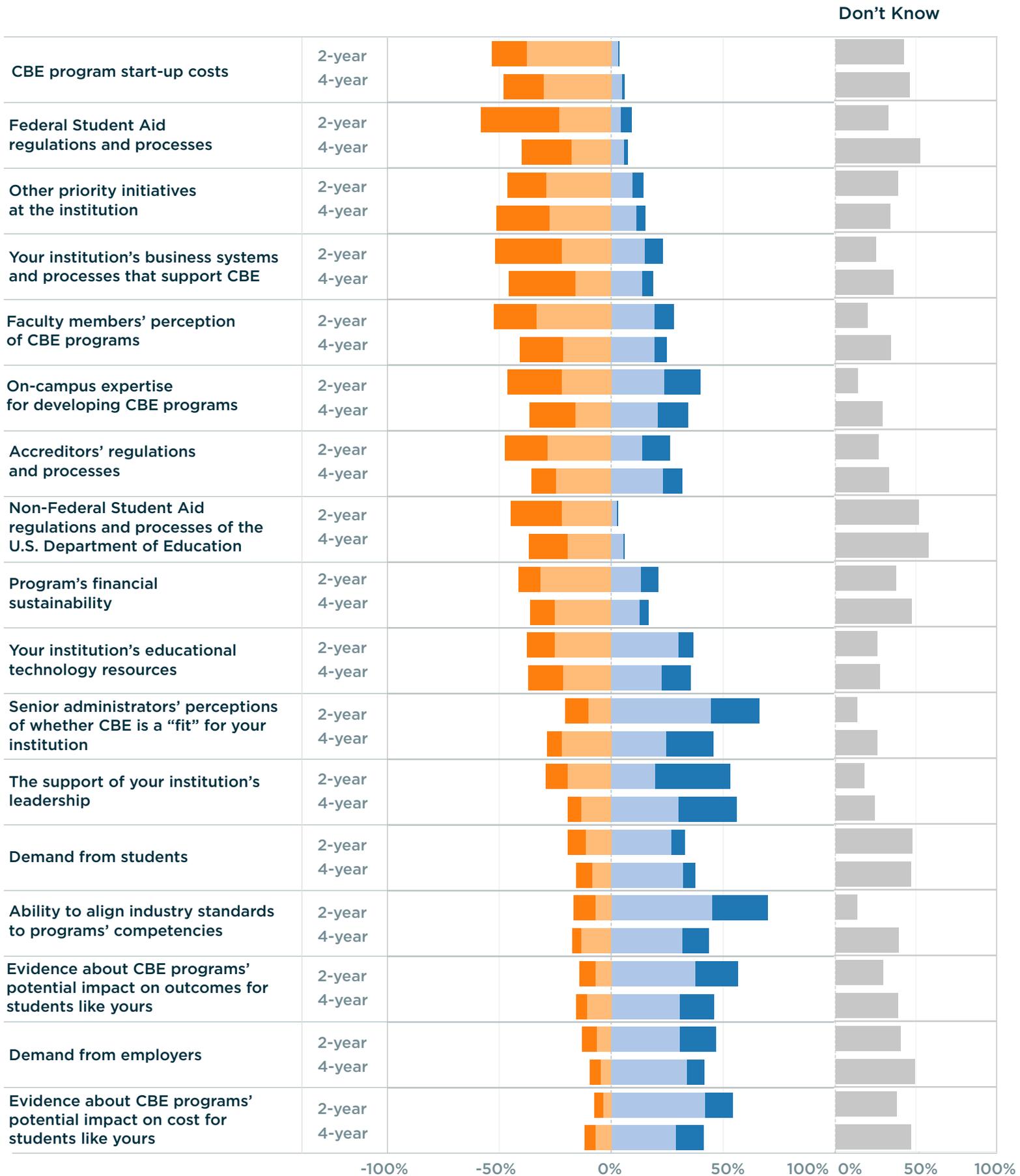


Figure 22. Extent to Which Factors Have Helped or Hindered Interest, Among Those Who Are Interested in CBE (But Report No Adoption)

■ Significantly hindered ■ Somewhat helped
■ Somewhat hindered ■ Significantly helped

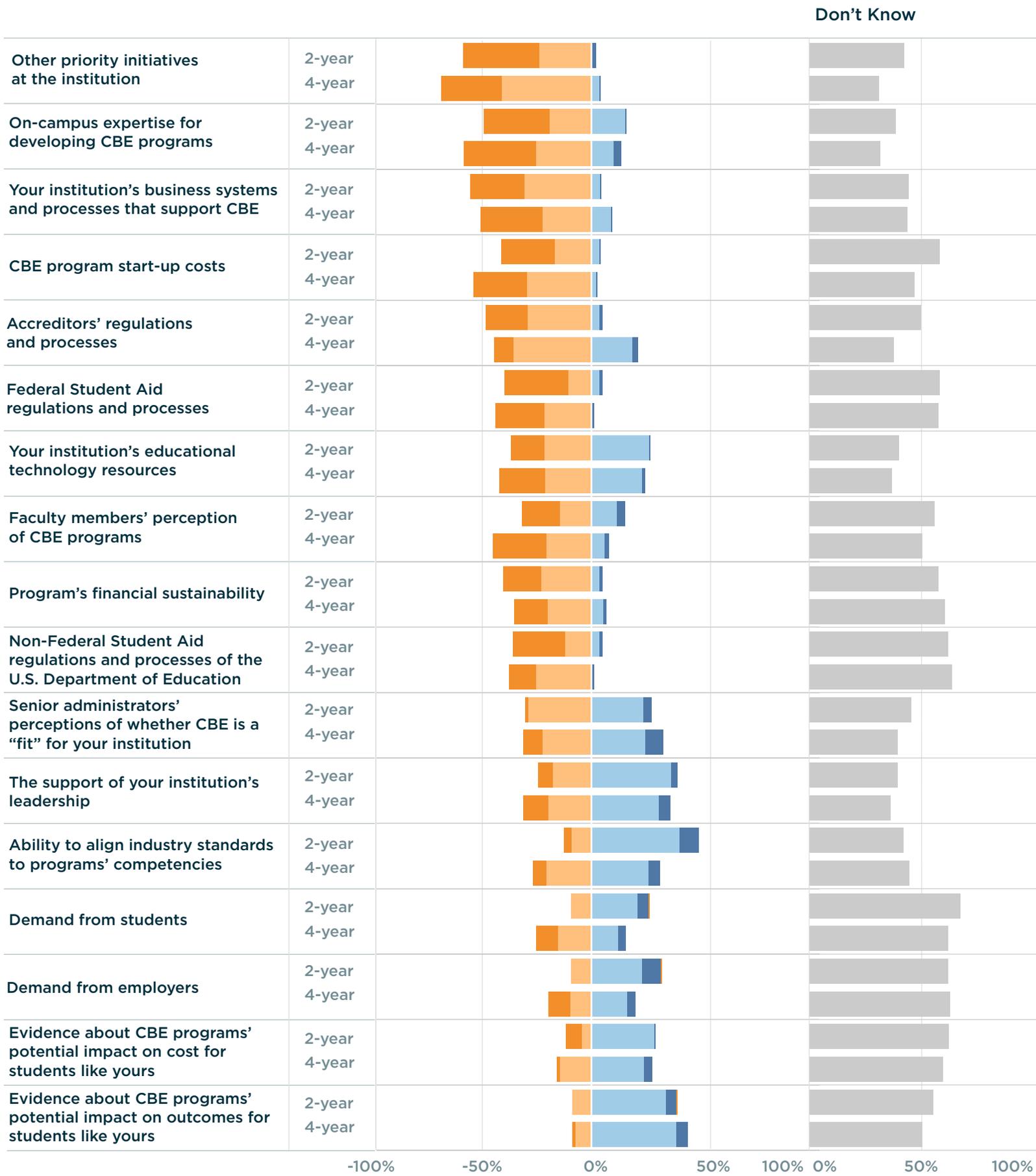


Figure 23. Extent to Which Factors Served as Barriers to Interest, Among Those Who Report No Interest in CBE

Major Factor
Minor Factor
Don't Know

37



How Do Institutions Perceive the Future of CBE?

Because of the importance of institutions' interest in and willingness to adopt or scale CBE program implementation, the 2018 and 2019 NSPCBE asked about expectations of the future of CBE, both nationally and at their own institutions. Consistent with last year's findings, most institutions (76%) in 2019 reported that they expected the number of CBE programs nationally to increase in the next 5 years (Figures 24-26), 22% of the institutions reported expecting the number of CBE programs to stay the same, and 2% of the institutions expected CBE programs to decrease.



For those institutions that responded in both 2018 and 2019, the change in expectations was marginal; overall, the share of institutions that reported expecting CBE to grow in the next 5 years increased from 77% in 2018 to 81% in 2019.

Figure 24. Expected Growth of CBE Nationally in the Next 5 Years

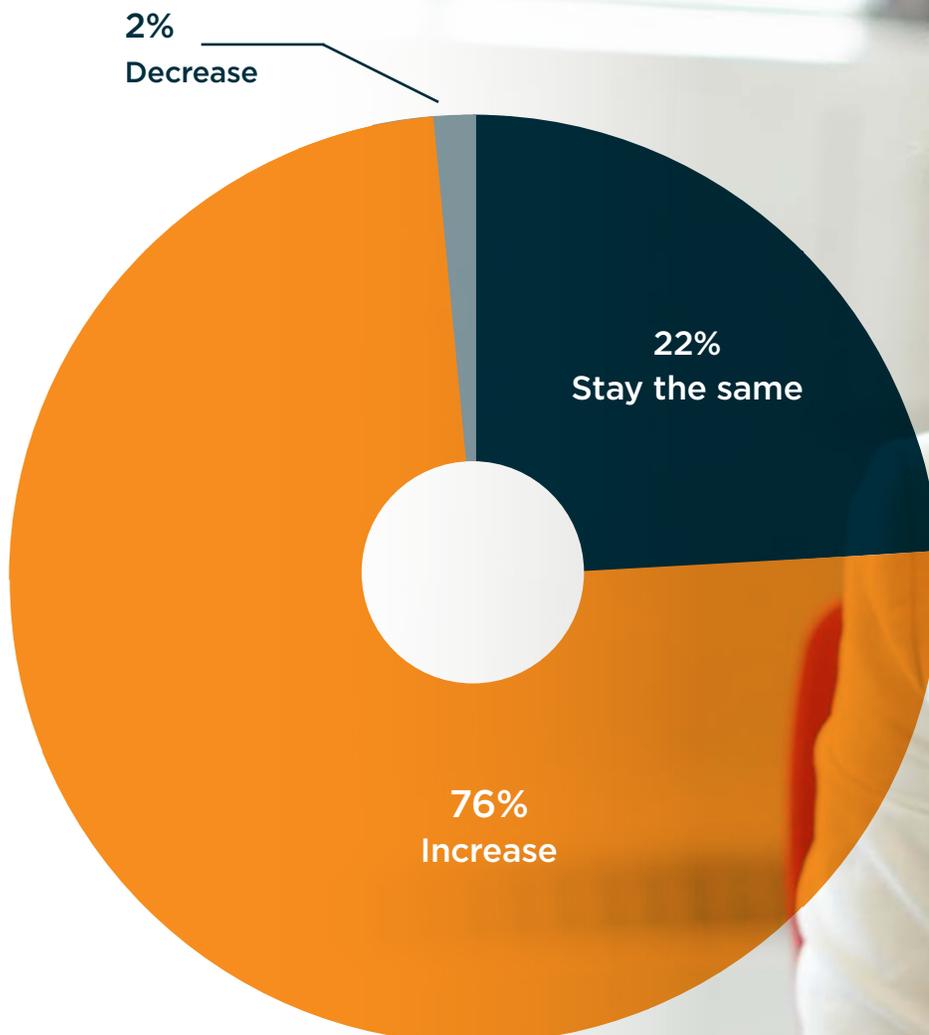
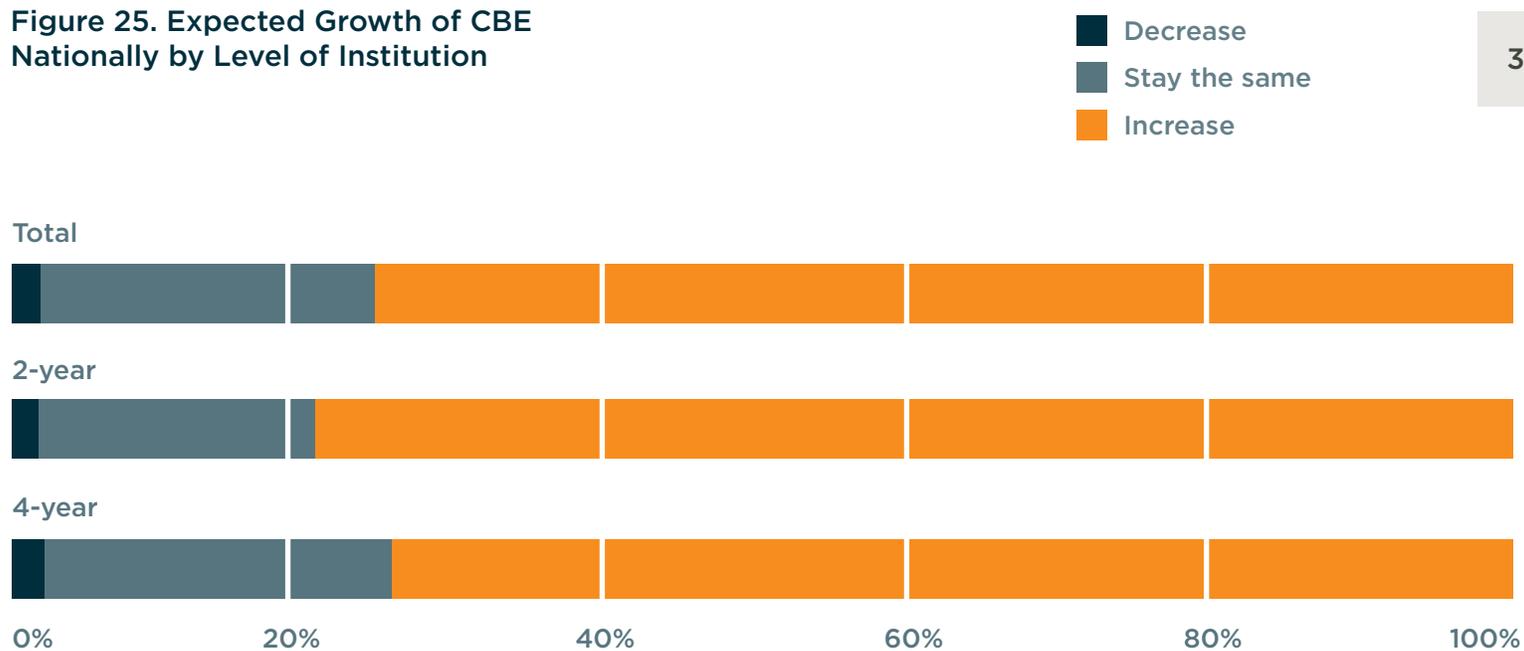
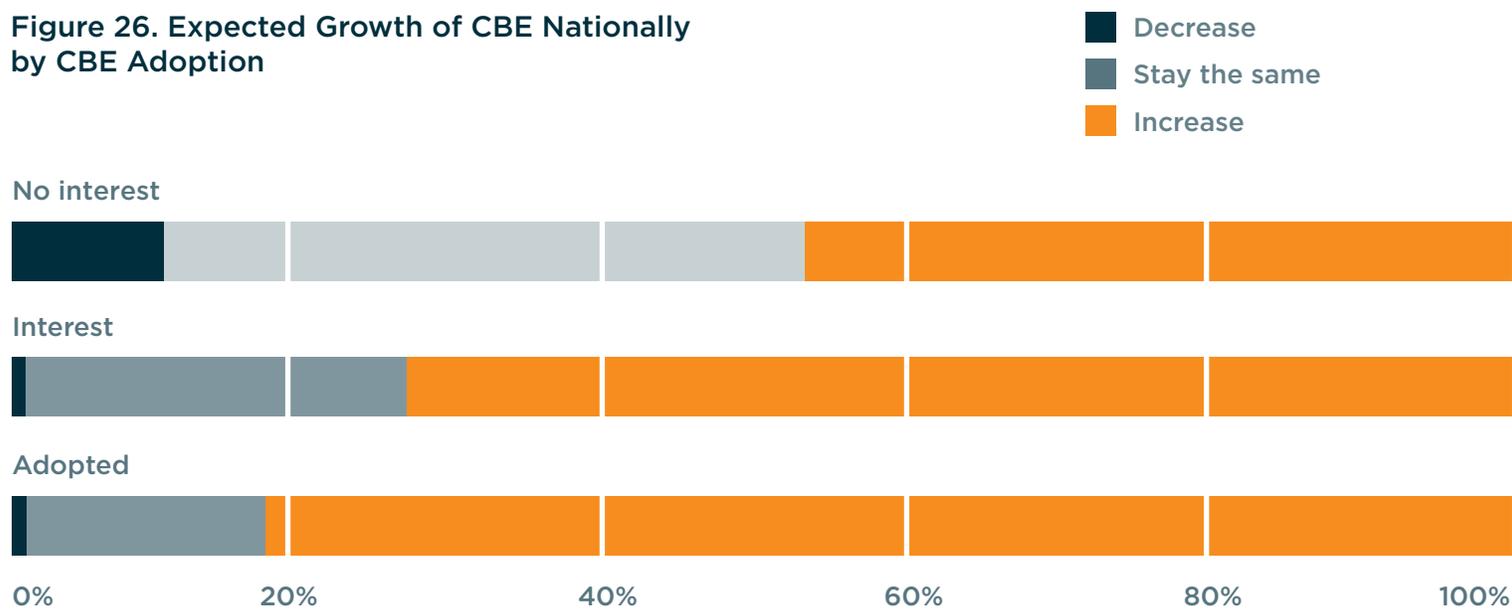


Figure 25. Expected Growth of CBE Nationally by Level of Institution



39

Figure 26. Expected Growth of CBE Nationally by CBE Adoption



New in 2019

Asking institutions about the growth of CBE at their own institutions adds nuance to the finding that most believe CBE will grow nationally. Of those with CBE programs, 61% of the institutions reported that they plan to increase the number of CBE programs at their institution in the next 5

years. In contrast, 37% of the institutions expected that the number of programs they offer may stay the same, suggesting that they may consider their institution to be “at scale” in terms of the number of CBE programs to be built (Figure 27).

Figure 27. Expected Growth in CBE at Individual Institutions

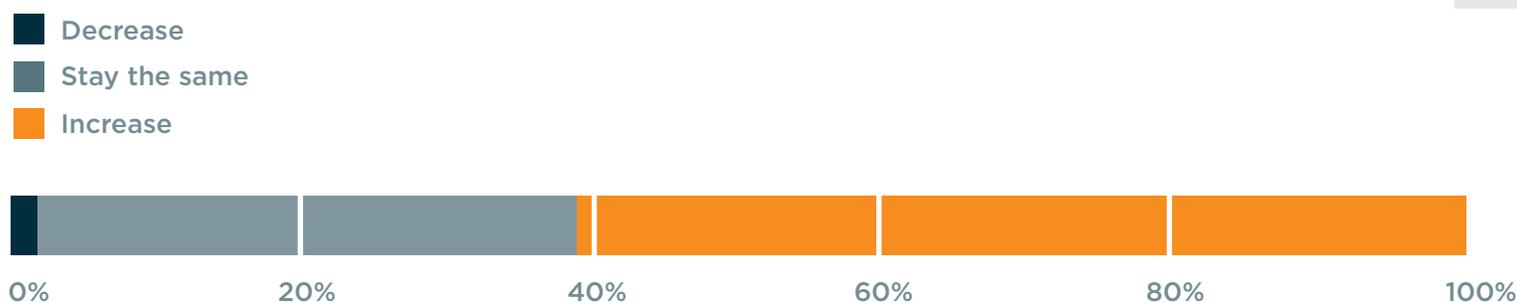
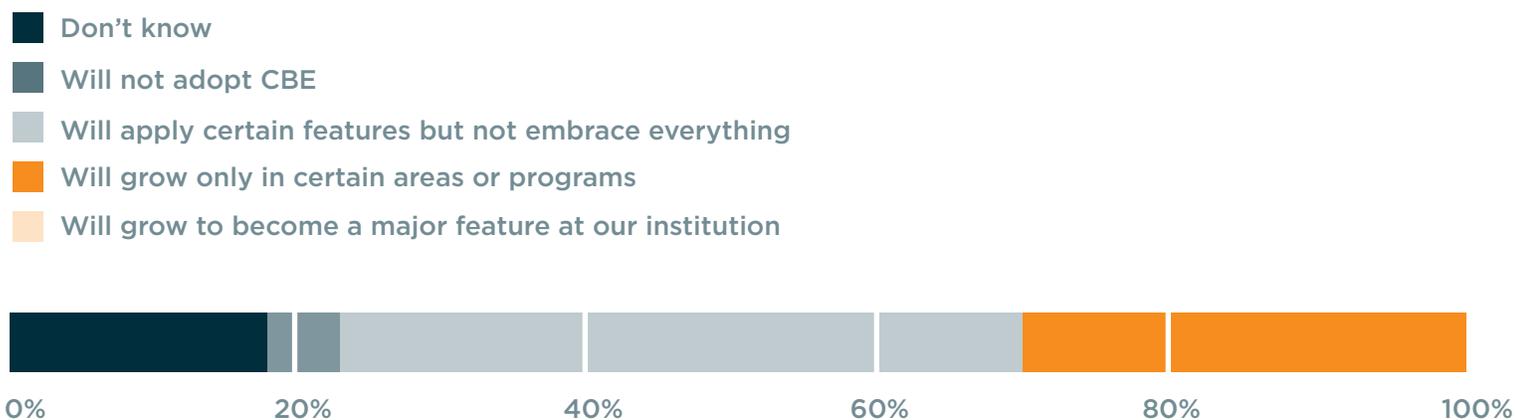


Figure 28. Expected Adoption of CBE in the Next 5 Years Among Institutions With Interest in CBE



Barriers, Facilitators, and the Future of CBE: Key Findings in 2019

Despite the perceived barriers to CBE implementation—both internal and external to the institution—most institutions remain optimistic about the future of CBE nationally and at their own institution.

Critical Questions Facing the Field

CBE in 2019

The 2019 NSPCBE paints a broad picture consistent with that of last year: It appears that the learner-centered logic of CBE remains compelling, and it seems compelling enough to support the indications of stability or incremental growth that we see across the survey responses. However, some of the key questions that arose from our findings in the 2018 NSPCBE findings are still relevant.

Can CBE succeed in traditional institutional contexts and the current external policy environment?

Much like last year, substantial activity appears to be taking place at the course level (but not the whole program), and institutions are adopting certain elements that may support eventual CBE adoption but have not yet built a full CBE program. When we put these findings side by side with the motivations and perceived benefits of CBE, it begs the question: Can institutions realize some benefits of CBE without adopting full programs—either adopting only some elements or using competency-based courses within a traditional program?

If we consider the top motivations related to improving workforce readiness or learning outcomes, the answer may be yes. Using program-wide competency architectures and assessment practices may help institutions achieve these goals, even if they do not build a full CBE program with the elements of advancement based only on mastery and flexible pacing. But if the core goal for an institution is about better serving nontraditional learners, doing so effectively may require flexible pacing throughout the student experience (i.e., through a whole program). Ultimately, these questions point to the importance of institutions considering their core goals for using CBE, and how, whether, and what kind of CBE model can help them solve a set of problems or reach their goals.

This year's analysis also indicates that many institutions, across all types, are wrestling with this question. In particular, we see this when they indicate that they view CBE as a tool to be used in *some but not all* programs, or from which to use some elements.

Can CBE succeed in traditional institutional contexts and the current external policy environment?

Consistent with the 2018 findings, institutions again reported a number of significant barriers to CBE implementation, both internal and external to the institution. Our new 2019 analysis of institutions' planning phase progress indicates that many steps remaining for many institutions involve both internal and external stakeholders, indicating that both play a role in either supporting or hindering progress.

Taken together, these findings indicate that barriers and enablers exist at every level—within departments; within institutions; and in the ecosystem of policy, regulation, and stakeholders that influence institutions. Although FSA regulations were among the top barriers, it does not appear that one federal policy change would instantly spur progress at all interested institutions; internal factors (e.g., program start-up costs) and other priorities may still stand in the way. And we may have tested an example of that this year: we fielded the 2018 survey while ED's final decision about Western Governors

University's CBE model was still pending; by the 2019 survey, ED had finalized a decision and did not find the university's model of CBE out of compliance (ED, 2019). It does not appear that the final ruling drastically changed institutions' perceptions of or plans for CBE. However, we recognize a continued uncertainty in the policy environment because of the negotiated rule-making session that included CBE topics, as well as continued legislative interest from the House Committee on Education and Labor Committee relevant to Higher Education Act reauthorization.²¹ And, although we labeled some barriers as internal, we note that it may be possible for external actors to influence the perceived barriers. For example, state policymakers interested in expansion could support program development grants to offset start-up costs or convene employers and help them send clearer signals to institutions to remove uncertainty about employer demand.

That said, the persistent optimism about the potential for CBE's growth nationally—with 76% of the institutions expecting growth in the next 5 years, and many anticipating some form of growth at their own institutions—indicates that although institutions recognize these barriers at all levels, the barriers do not seem to dampen their expectation about CBE's potential growth ahead.



**CBE institutions
expecting growth in
the next 5 years**

²¹ For more information, see the Introduction section in this report.

The Road Ahead

Many of the considerations that we noted last year for program leaders, institutional leaders, and policymakers are still present and broadly center on what is the best way to start, experiment with, or scale CBE, particularly when it necessitates a redesign of the teaching and learning function, internal business processes within the institution, and the external policy environment. This survey demonstrates that some institutions, and many programs within those institutions, have begun to answer these questions, but many more are still exploring those questions.

Future administrations of the NSPCBE and additional research can support policymakers, institution leaders, and practitioners in these questions. We consider the following questions to be critical:

- The 2019 NSPCBE revealed growth in CBE program implementation that can best be characterized as slow and steady, with incremental increases in the number of programs and course offerings. Questions to address include the following:
 - Does this slow and steady growth to date suggest that growth of the CBE field will be more sustainable in the long term?
 - Can the field and vendors support programs at this rate?
- Findings from the survey consistently highlight that current CBE implementation is small scale, and institutions perceive continued substantial barriers to implementation, perhaps suggesting that CBE program implementation, most of which is represented by a small subset of institutions, is still limited to innovators and early adopters (Rogers, 2010). For proponents of CBE, the key questions are twofold:
 - At what level of adoption will a larger share of institutions feel comfortable making the considerable changes needed to adopt CBE?
 - What are the main barriers to entry that need to be mitigated?

To begin to address these questions, the 2020 administration of the NSPCBE will seek to include more questions about existing programs, particularly as the field matures and settles on descriptions of the key components (e.g., types of disaggregated faculty models and pricing models). In addition, we will consider the feasibility of follow-up questions about some of the top barriers cited by institutions to more precisely identify the current challenges and potential solutions.

We also intend for this survey to inspire researchers to explore and interrogate some of the most pressing questions in the field that are beyond what the NSPCBE can capture. Qualitative exploration of themes identified in this survey includes CBE implementation, perceptions, and faculty and student experiences. In addition, further quantitative analysis will be crucial to understanding both faculty experiences and student enrollment and outcomes. Together, these questions will contribute to answering important questions about how and whether CBE serves students and contributes to equitable pathways and outcomes for students.

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Appendix A Survey Descriptive Statistics

The following tables provide details on responses to questions related to program implementation. These responses are based on respondents who indicated that they had a CBE program, which is a subset of the overall respondents. We advise caution in interpretation for this reason, and instances where fewer than 50 institutions responded are noted.

Table A1. How long has your institution offered competency-based courses?

| Time | Percentage |
|-------------------|------------|
| Less than 1 year | 10% |
| 1-2 years | 17% |
| 3-4 years | 21% |
| 5-7 years | 12% |
| More than 7 years | 27% |
| Don't know | 12% |

Table A2. How long has your institution offered entire programs that are exclusively CBE?

| Time | Percentage |
|-------------------|------------|
| Less than 1 year | 12% |
| 1-2 years | 17% |
| 3-4 years | 19% |
| 5-7 years | 8% |
| More than 7 years | 41% |
| Don't know | 4% |

Table A3. Do your CBE programs . . .

| | Don't know | No, none do | Yes, some do | Yes, all do |
|--|------------|-------------|--------------|-------------|
| Lead to a certificate, undergraduate degree, or graduate degree, if completed? | 2% | 2% | 14% | 82% |
| Require mastery learning of all competencies in a program? | 8% | 2% | 7% | 82% |
| Primarily require students to demonstrate their competency via authentic assessments? | 3% | 0% | 18% | 79% |
| Use "backward design," where the competencies to be mastered drive students' learning journey? | 15% | 12% | 20% | 54% |

Table A4. At which award levels are your undergraduate CBE programs offered? (Check all that apply.)

| Award level | Percentage |
|--------------------|------------|
| Noncredit | 9% |
| Certificate | 51% |
| Associate's degree | 40% |
| Bachelor's degree | 57% |

Table A5. In what disciplines are your undergraduate CBE programs offered? (Check all that apply.)

| Discipline | Percentage |
|---|------------|
| Biological and life sciences | 7% |
| Business administration | 34% |
| Computer and information sciences and support services | 35% |
| Construction trades | 7% |
| Education | 23% |
| Liberal arts and humanities | 11% |
| Mechanic and repair technologies | 16% |
| Nursing and health professions | 42% |
| Physical sciences (e.g., chemistry, engineering) | 1% |
| Social sciences (e.g., psychology, sociology, political science, economics) | 8% |
| Other | 29% |

Table A6. For the most recent academic year for which you have data available, about how many undergraduate students . . .

| | 0-50 | 51-100 | 101-200 | 201-499 | 500-1,000 | More than 1,000 |
|--|------|--------|---------|---------|-----------|-----------------|
| Are enrolled in CBE programs that are entirely competency based? | 53% | 5% | 2% | 18% | 11% | 12% |
| Are expected to be enrolled in your CBE programs that are entirely competency based within 5 years?* | 27% | 7% | 6% | 13% | 13% | 32% |
| Have graduated from CBE programs that are entirely competency based? | 58% | 5% | 5% | 17% | 12% | 4% |

* Fewer than 50 institutions provided applicable data for this item. Please interpret with caution.



Table A7. At which award levels are your graduate (postbaccalaureate) CBE programs offered? (Check all that apply.)

| Award level* | Percentage |
|---------------------|------------|
| Noncredit | 0% |
| Certificate | 35% |
| Master's degree | 77% |
| Professional degree | 29% |
| Doctoral degree | 19% |

* Fewer than 50 institutions provided applicable data for this item. Please interpret with caution.

Table A8. In what disciplines are your graduate (postbaccalaureate) CBE programs offered? (Check all that apply.)

| Discipline ^a | Percentage |
|---|------------|
| Biological and life sciences | 1% |
| Business administration | 39% |
| Computer and information sciences and support services | 20% |
| Construction trades | 0% |
| Education | 35% |
| Liberal arts and humanities | 0% |
| Mechanic and repair technologies | 0% |
| Nursing and health professions | 49% |
| Physical sciences (e.g., chemistry, engineering) | 1% |
| Social sciences (e.g., psychology, sociology, political science, economics) | 2% |
| Other | 36% |

^a All disciplines have less than 50 institutions with applicable data for this item.

Table A9. For the most recent academic year for which you have data available, about how many graduate (postbaccalaureate) students are enrolled in CBE programs that are entirely competency based?*

| Number of students | Percentage |
|--------------------|------------|
| 0-50 | 13% |
| 51-100 | 31% |
| 101-200 | 6% |
| 201-499 | 17% |
| 500-1,000 | 29% |
| More than 1,000 | 4% |

* Fewer than 50 institutions provided applicable data for this item. Please interpret with caution.

Table A10. For the most recent academic year for which you have data available, which best describes the composition of graduate students enrolled in your certificate and degree programs that are entirely competency based?

| Demographic composition* | Percentage of graduate students enrolled in your certificate or degree programs that are entirely competency based | | | | |
|---|--|--------|---------|---------|-------------|
| | Don't know | 0%-24% | 25%-49% | 50%-74% | 75% or more |
| Percentage who are White, non-Hispanic | 25% | 0% | 16% | 37% | 22% |
| Percentage who are at least 25 years old | 16% | 9% | 26% | 8% | 41% |
| Percentage who are veterans or active duty military personnel | 41% | 56% | 3% | 0% | 0% |

* Fewer than 50 institutions provided applicable data for this item. Please interpret with caution.

Table A11. Have you used the following resources as you developed your program (for institutions with programs or in the process of adopting)?

| Resource | Percentage |
|--|------------|
| Quality Framework published by the Competency-Based Education Network | 36% |
| The Connecting Credentials Framework/Beta Credentials Framework ^a | 5% |
| LEAP/VALUE rubrics published by AAC&U ^b | 42% |
| Resources provided by the U.S. Department of Labor (O*NET, Building Blocks) | 39% |
| Degree Qualifications Profile ^c | 50% |
| Employer or industry competency models | 75% |

^aSponsored by Lumina Foundation. ^bLEAP is Liberal Education and America's Promise. VALUE is Valid Assessment of Learning in Undergraduate Education. AAC&U is the Association of American Colleges and Universities. ^cDeveloped by Lumina Foundation.



Appendix B

Technical Documentation

This appendix outlines the methods of the NSPCBE, which was a Web-based survey administered from March 28 to May 15, 2019.

Survey Instrument Changes

The survey instrument for 2019 remained largely consistent with that in 2018, with some limited exceptions:

- Two questions were added, focused on (a) better understanding those who reported they were in the planning phase by asking what planning steps they had already taken and (b) asking a question about affordability/price compared with traditional programs. These two areas were key gaps observed during analyses in 2018.
- Several questions determined to be largely redundant or no longer appropriate for the field were removed, especially because the survey was quite long for those who had CBE programs. These dropped questions focused on course content development, specific uses of technology, who creates CBE competencies, and the use of student data and graduate support. Each topic was broadly useful, but the questions may need refinement via qualitative exploration (e.g., cognitive interviews) before being included again in a survey.
- Edits to questions were made sparingly, breaking longitudinal trends only when necessary. Specific wording adjustments were made to questions that yielded substantial “Don’t know” responses and refusals (skips) in 2018. Examples of such adjustments included a new way of asking about student demographics in CBE programs and moving from asking the respondent to select a range of percentages toward asking them to compare the CBE student demographics to those in their traditional programs using “less, about the same, or more.” Response options also were added where appropriate (e.g., “Demand from employers” as a potential helping or hindering factor).

- On the advice of the advisory board, a critical definition element of CBE was edited slightly because the language no longer fit the field. “Self-paced” was changed to “flexible pacing,” in part because (a) self-paced has a meaning in regulations not intended to reference in the survey, and (b) it became clear that some CBE programs may avoid reporting themselves as self-paced because their programs include some guidance or limits on students’ pace. This may affect respondents’ interpretation of the question, perhaps encouraging more respondents to view their program as fitting the definition of this element; findings that might be affected by this change are noted throughout this report.

Population and Sampling

The NSPCBE was intended to be administered to administrators at all 4,782 degree-granting 2- and 4-year IHEs in the United States. A list of such institutions was drawn from the IPEDS. Because this is a census, no sampling occurred.

Not all institutions were contacted for the survey; however, if the institution could not be successfully “rostered” (i.e., the research team could not obtain e-mail contact information for at least one administrator who may be knowledgeable about CBE programs), it was not contacted. Contact information was obtained from directory files available through Higher Education Publications’ HigherEd Direct (HED) database of higher education institutions, which was purchased by the research team. As a result, 3,279 institutions were contacted about participating in the survey.

Because this was a census and not a probability sample, no estimates of sampling error will be reported.

Recruitment and Survey Follow-Up

The online survey was administered in English. The full survey instrument will be made available on request.²²

A survey prenotification e-mail was sent to all rostered institutions on March 22, 2019, to make them aware of the upcoming survey request. A survey invitation e-mail that included a link to the survey was sent on March 28, 2019. Five e-mail

reminders and one mailed reminder were sent to nonrespondents.

About half of the institutions had e-mail addresses available for more than one contact person. The prenotification and survey invitation e-mails were sent only to the person listed as the primary contact. However, all e-mail reminders were sent to all available e-mail addresses. To minimize duplication of responses from a single institution, once one reply was received for an institution, the survey was closed for that institution, and no additional e-mail reminders were sent to any of the contact persons for that institution.

The survey closed on May 15, 2019.

Duplicate Responses

In two instances, more than one person from the same institution responded to the survey. These records were manually reviewed, and the most complete response was retained.

Response Rates

The overall response rate for this survey was 18%; 602 of the 3,279 rostered institutions responded.

Response rates may be calculated in a variety of different ways. The American Association for Public Opinion Research (AAPOR) has standardized response rate calculations across the survey and polling industry, providing a variety of different options for researchers.²³ In this study, AAPOR's Response Rate 2 (RR2) was used to calculate response rates:

$$\text{AAPOR RR2} = (\text{Completes} + \text{Partials}) / (\text{Completes} + \text{Partials} + \text{Eligible Nonrespondents})$$

Partial responses were counted as such if the respondent completed the screener (through Question 5) but did not complete the rest of the survey. If individuals logged into the survey but did not complete the screener, they were considered nonrespondents. We counted individuals who completed at least one relevant survey item beyond the screener as completers.

Weighting

The target population for the NSPCBE consists of IHEs in the United States. For weighting purposes, the target population was defined as the 4,782 institutions meeting both of the following criteria:

- The institution is included in the data from the most recent IPEDS cycle (2017).²⁴
- IPEDS indicates it is a degree-granting, 2- or 4-year institution.²⁵

Thus, weighted estimates are representative of all such institutions in the United States. This definition differs from the definition used in the response rate calculation, which is limited to the 3,279 institutions for which contact information was available for sending the survey invitation.

Response to the NSPCBE can be understood as the outcome of a two-stage process. The first stage is contactability—whether contact information was obtained for an institution. The second stage is cooperation—whether, conditional on being contacted, the institution completed enough survey items to be classified as a full or partial respondent. The characteristics associated with contactability may differ from those associated with cooperation. For this reason, a two-stage weighting process, with separate adjustments for noncontactability and noncooperation, was used.

This weighting approach, and therefore the implied target population, differs from the 2018 NSPCBE. In 2018, the weighting procedure included an adjustment for cooperation but not an additional adjustment for contactability. Thus, respondents were weighted only to the characteristics of the contactable sample, implying that weighted estimates were representative only of the contactable institution rather than the full IPEDS universe. An analysis of the consequences of this different approach demonstrates very small differences, none of which were large enough to affect the directionality of findings or conclusions in either report.

²² To request a copy of the full survey instrument, please contact the research team at postsecbce@air.org.

²³ See [https://www.aapor.org/Standards-Ethics/Standard-Definitions-\(1\).aspx](https://www.aapor.org/Standards-Ethics/Standard-Definitions-(1).aspx) for more information.

²⁴ Six IHEs that did not appear in the 2017 IPEDS universe files, but they were in the HED database and thus were retained in the target population. One such IHE was a known CBE user. The other five IHEs appear in the online IPEDS search tool but not the IPEDS universe files. Because they appeared to be IPEDS schools, these five IHEs were retained in the target population, but these institutions were weighted separately because of the lack of data for IPEDS predictors.

²⁵ More specifically, the following institutions were included: those where DEGRANT equals 1 (degree-granting institutions) and where SECTOR equals 0 (administrative units) or 1 through 6 (public, private nonprofit, and private for-profit 2- and 4-year institutions). Two additional institutions that were in the HED database but listed as nondegree granting in IPEDS (because of unique state system policies) also were included because they would be considered degree granting in other states. Administrative units were included because some are likely eligible depending on how the associated college or university system is structured. However, because these institutions are conceptually very different from those with SECTOR equal to 1 through 6, they were weighted separately.

Creation of Weighting Cells

To calculate the weights, first the full target population of 4,782 institutions was partitioned into nine noncontact adjustment cells using a classification and regression tree (CART),²⁶ a machine learning algorithm that automatically identifies predictors associated with a dependent variable of interest—in this case, the IPEDS variables²⁷ that are most associated with the likelihood of having contact information. The algorithm then successively partitions the universe into cells defined by those variables, with the aim of maximizing between-cell variability in the response rate.

This procedure resulted in nine noncontactability adjustment cells defined by the following variables:²⁸

- **SECTOR** (sector of institution)
- **FISYSTYP** (whether institution is part of a multicampus or multi-institution organization)
- **C15IUG** (Carnegie Classification 2015: Undergraduate Instructional Program)
- **EFTOTL_ALL_D** (total fall enrollment, all students—categorized into deciles)
- **STABBR** (state)

The procedure was then repeated to create noncooperation adjustment cells using the 3,279 institutions for which contact information was available. These institutions were partitioned into six noncooperation adjustment cells.

The following variables defined the noncooperation adjustment cells:

- **SECTOR** (sector of institution)
- **R2018** (whether the institution participated in the 2018 NSPCBE)
- **STABBR** (state)
- **PT_EFYHISPW_UG_D** (percentage Hispanic female 12-month enrollment, undergraduates, categorized into deciles)

Calculation of Weights

First, every responding institution i was assigned a noncontact weight calculated as follows:

$$w_{i,c} = \frac{N_{i,c}}{n_{i,c}}$$

where $N_{i,c}$ is the number of institutions in the target population and $n_{i,c}$ is the number of in-sample institutions, both within the institution's noncontact adjustment cell c . That is, the noncontact weight is the ratio of the target population to the sample size within a given noncontact adjustment cell.

Second, every responding institution i was assigned a noncooperation weight calculated as follows:

$$w_{i,d} = \frac{\sum_{j=1}^{n_{i,d}} w_{j,c}}{\sum_{j=1}^{r_{i,d}} w_{j,c}}$$

where $n_{i,d}$ is the sample size and $r_{i,d}$ is the number of respondents, both within the institution's noncooperation adjustment cell d ; and $w_{j,c}$ is institution j 's noncontact weight. That is, the noncooperation weight is the ratio of the sum of the noncontact weights over all in-sample institutions to the sum of the noncontact weights over responding institutions within a given noncooperation adjustment cell.

The final weight for a responding institution i was then calculated as the product of the noncontact weight and the noncooperation weight:

$$w_{i,f} = w_{i,c} * w_{i,d}$$

When calculated in this way, the sum of the final weight over all 602 respondents is equal to the size of the target population (4,782).

²⁶ The specific CART implementation was the `rpart` function in R, available in the `rpart` package. For the noncontactability adjustment, a minimum cell size of 35 was specified; for the noncooperation adjustment, a minimum cell size of 65 was specified. For both, a complexity parameter of 0 was specified.

²⁷ In addition to the IPEDS variables, an indicator of whether the IHE participated in the 2018 NSPCBE was considered as a predictor.

²⁸ As noted earlier, the non-IPEDS institutions were weighted separately because of the lack of data for the IPEDS predictors, and the administrative units were weighted separately because they may differ substantially from other institutions in the IPEDS universe. The CART algorithm was run separately on the three subpopulations. In practice, due to the small size of the non-IPEDS and administrative unit subpopulations, the algorithm was unable to identify any further partitions within these cells for either noncontactability or noncooperation.

²⁹ Although SECTOR was not selected by the CART algorithm used for the noncooperation adjustment, the treatment of non-IPEDS institutions and administrative units as their own weighting cells means that SECTOR was implicitly used to define the noncooperation adjustment cells.



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