

AMERICAN ACADEMY
OF ARTS & SCIENCES

REPORT
BRIEF

THE FUTURE OF UNDERGRADUATE EDUCATION

THE FUTURE OF AMERICA

Commission on the Future of Undergraduate Education

THE FUTURE OF UNDERGRADUATE EDUCATION,
THE FUTURE OF AMERICA

REPORT BRIEF

Publications of the Commission on the Future of Undergraduate Education

A Primer on the College Student Journey
(American Academy of Arts and Sciences, 2016)

The Complex Universe of Alternative Postsecondary Credentials and Pathways, Jessie Brown and Martin Kurzweil, Ithaka S+R
(American Academy of Arts and Sciences, 2017)

Undergraduate Financial Aid in the United States,
Judith Scott Clayton
(American Academy of Arts and Sciences, 2017)

The Economic Impact of Increasing College Completion,
Sophia Koropecy, Chris Lafakis, and Adam Ozimek, Moody's Analytics
(American Academy of Arts and Sciences, 2017)

Policies and Practices to Support Undergraduate Teaching Improvement,
Aaron M. Pallas, Anna Neumann, and Corbin M. Campbell
(American Academy of Arts and Sciences, 2017)

The Future of Undergraduate Education, The Future of America
(American Academy of Arts and Sciences, 2017)

COMMISSION ON THE FUTURE OF UNDERGRADUATE EDUCATION



THE FUTURE OF UNDERGRADUATE EDUCATION

THE FUTURE OF AMERICA

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ACKNOWLEDGMENTS

The Future of Undergraduate Education, The Future of America is published at a critical moment in our nation's history, when so many long-standing assumptions about who we are as a people, and where we are headed, have been called into question.

For over a century, we have pursued grand ambitions—groundbreaking scientific discoveries, life-changing technological advances, hard-won social change—and emerged ever stronger, if still imperfect, from our struggles. In recent years, however, we appear to have lost some of that motivating enthusiasm, the optimism that has always lifted us as a people. As we grapple with persistent social inequalities, widening political divisions, prolonged international conflict, and intensifying environmental challenges, we often seem more concerned with the limits of our present capabilities than in the realization of our dreams.

If we are to regain our momentum, as we have after so many other challenging moments in our past, we will have to find new ways to channel our inexhaustible creativity, restore a measure of civility to the national discourse, and bridge our differences. In short, we will have to recommit to the promise of education—to study the lessons of the past, analyze the requirements of the present, and imagine the innovations that will brighten our future. Education is not the solution to every problem, but it is often the best tool we have at our disposal, and there is good reason to believe it has been the primary source of our greatest achievements over the past century.

This report offers practical and actionable recommendations to improve the undergraduate experience. But in its practicality, it is motivated by the highest ideals: faith that every person, from every background, can succeed in America when given the proper training and preparation; confidence that our existing institutions of higher education can and will evolve to meet the needs of today's and future students; and an unwavering commitment to the free exchange of ideas as the basis of a creative, productive, and democratic society. As stated in the conclusion of this report, "Progress is not guaranteed, and good things will happen only with sustained effort, but if we can sustain focus on the work, combining patience with urgency, we can, through undergraduate education, make great advances as individuals and as a nation."

The Commission on the Future of Undergraduate Education, which authored this report, was created in 2015 by the American Academy of Arts and Sciences in response to a suggestion from Dr. Vartan Gregorian, president of Carnegie Corporation of New York. Dr. Gregorian observed that the context and expectations for American undergraduate education had changed dramatically over the past few decades, as our colleges and universities opened their doors to new populations of students (young and old, traditional and nontraditional, immigrant and international) and that it was time for a new study to examine the student educational journey. He therefore asked the American Academy to examine the current state of American undergraduate education, project the nation's short-term and long-term educational needs, and offer recommendations for strengthening all aspects of undergraduate education. We are grateful for his encouragement and for the support of Carnegie Corporation.

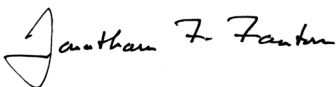
ACKNOWLEDGMENTS

We are also very fortunate to have had the leadership of our distinguished cochairs, Michael McPherson, president emeritus of the Spencer Foundation, and Roger Ferguson, president and chief executive officer of TIAA. Their rigorous approach to the task, generosity of spirit, and deep knowledge of higher education have been invaluable to this effort. Thanks as well to all the Commission members (see Appendix A for a complete list), whose dedication and creativity enriched this effort and who modeled the kind of civil discourse and consensus-building that is, itself, one of the primary goals of undergraduate education. In preparation for this final report, they also published several occasional papers that elaborate many of the themes delineated in the pages that follow: *A Primer on the College Student Journey*, *The Complex Universe of Alternative Postsecondary Credentials and Pathways*, *Undergraduate Financial Aid in the United States*, *Policies and Practices to Support Undergraduate Teaching Improvement*, and *The Economic Impact of Increasing College Completion*. All of these publications are now available at www.amacad.org/cfue.

Over a two-year period, the Commission sought advice from a wide range of experts and organizations, all listed in Appendix B. We are grateful to all of them for their insights and suggestions. We also thank the following individuals for their time and counsel: David Autor, Larry Bacow, Cynthia Barnhart, Christopher Bishop, Derek Bok, Phil Bredesen, Louise Bryson, Mary Sue Coleman, Ron Daniel, Michael Dennin, Nicholas Dirks, Robert Haas, Dale Jorgenson, Jerry Kagan, Nan Keohane, Raynard Kington, Richard Light, Sara Lawrence-Lightfoot, Martin Lipton, Stan Litow, Tony Marx, David Oxtoby, Robert Pozen, David Pritchard, Virginia Sapiro, Alfred Spector, Jerry Speyer, and Mitchell Stevens.

Thanks as well to the members of the Academy's Board of Directors, Council, and Trust for their leadership, advice, and support for this project, and to the Academy staff who ably served this Commission and prepared this report: Francesca Purcell, Eliza Berg, John Tessitore, Phyllis Bendell, Alison Franklin, Heather Mawhiney, Scott Raymond, and Peter Walton; and consultants Lara Couturier and Richard Kazis.

This report is the culmination of a long process of research and deliberation, but it is only the beginning of the effort to strengthen undergraduate education in America. We will need many willing partners to help advance our recommendations. We look forward to working with you, and to hearing your thoughts about this report, in the months and years ahead.



Jonathan F. Fanton
President
American Academy of Arts and Sciences

INTRODUCTION

Our nation's effort over two centuries to provide education to everyone who lives and works within the United States is an expression of a core belief, one that has survived a long history of challenges: that all people, through learning, can achieve higher goals for themselves and for society as a whole.

Progress toward universal education in the United States has been slow and difficult, but the trend over time has been toward greater access and greater opportunity for more people of different regions and backgrounds. In the nineteenth century, the United States established

challenge of *quantity* in American undergraduate education, of enrolling as many students as possible, is increasingly a challenge of educational *quality*—of making sure that all students receive the education they need to succeed, that they are able to complete the studies they begin, and that they can do all of this affordably, without mortgaging the very future they seek to improve. The breadth and diversity of today's undergraduate population represent a great national achievement, but only if we can ensure that all students receive the rigorous knowledge and preparation they seek when they enroll—the education they need to succeed in

What was once a challenge of *quantity* in American undergraduate education, of enrolling as many students as possible, is increasingly a challenge of educational *quality*—of making sure that all students receive the education they need to succeed, that they are able to complete the studies they begin, and that they can do all of this affordably, without mortgaging the very future they seek to improve.

local, public “common schools” for young children. In the first half of the twentieth century, high school became a universal experience for young adults. And in the second half of the twentieth century, colleges and universities expanded in size and number, as well as in academic offerings, to introduce more students of all ages and backgrounds to the kinds of opportunities once reserved only for a social and economic elite.

Our challenge today is to help the nation's extraordinary institutions of higher education work more effectively and efficiently for students in the twenty-first century. **What was once a**

their personal, professional, and civic lives. This is, in fact, a critical test for the American commitment to education, as the decades-long effort to welcome more students from different backgrounds, and to accommodate a more varied set of student expectations, has been so successful that colleges and universities, policy-makers, business and philanthropy leaders, and students and their families are now compelled to adjust to this next national challenge.

Almost 90 percent of high school graduates can expect to enroll in an undergraduate institution at some point during their young adulthood, and

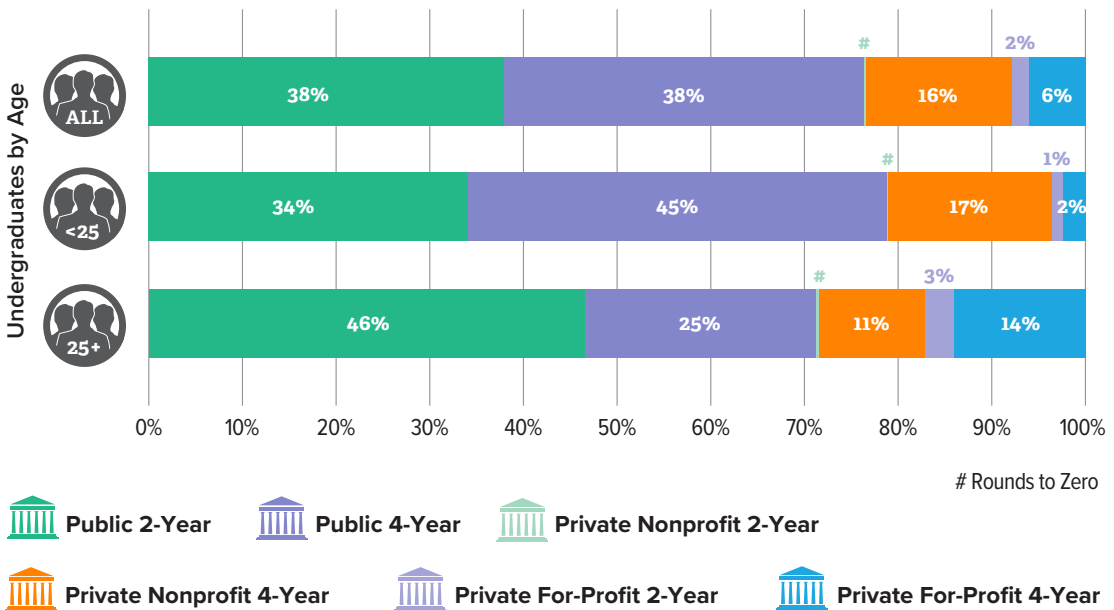
smaller percentages continue their education through career and technical schools, apprenticeships, work-based training programs, and other alternatives.¹ Every fall, over 17 million students of all ages and backgrounds enroll at approximately 4,700 colleges and universities, attending either in-person or virtually, to earn an ever-widening array of certificates and associate's and baccalaureate degrees. Eighty percent enroll in the nation's public community colleges and state universities, while others attend a diversity of private nonprofit and for-profit institutions (see Figure

A below). About one-third of enrolled students are over 25 years old, and almost 40 percent are enrolled on a part-time basis.²

Their motivations are varied, perhaps even unique to each individual, but in aggregate Americans are looking to undergraduate education to help them navigate a time of accelerated demographic, technological, and political change.

- They find themselves living in a nation that is increasingly heterogeneous. In today's public

FIGURE A: Enrollment Rates for Undergraduates by Age and Type of Institution



SOURCE: National Center for Education Statistics, Digest of Education Statistics, Table 303.50, “Total Fall Enrollment in Degree-Granting Postsecondary Institutions, by Level of Enrollment, Control and Level of Institution, Attendance Status, and Age of Student: 2013,” https://nces.ed.gov/programs/digest/d14/tables/dt14_303.50.asp?current=yes; and National Center for Education Statistics, Digest of Education Statistics, Table 303.70, “Total Undergraduate Fall Enrollment in Degree-Granting Postsecondary Institutions, by Attendance Status, Sex of Student, and Control and Level of Institution: Selected Years, 1970 through 2025,” https://nces.ed.gov/programs/digest/d15/tables/dt15_303.70.asp?current=yes.

discourse, diversity is often reduced to the prediction that, by 2040, there will be no racial or ethnic majority in the United States.³ But the diversification of America can be described and documented in other ways, across aspects of religious belief, gender, language, political affiliation, and regional identification, to name a few. In every case, the public face of America has changed dramatically over the last few decades, and every American can now expect to come into contact with histories and worldviews quite different from their own, on a more regular basis. The development of an increasingly interconnected global economy will only reinforce this sense of profound ethnic, cultural, and linguistic change.

- Workers of the future can also expect to change occupations and careers several times and may even end up in jobs and industries that do not now exist. While it is impossible to predict future work trends with great accuracy, emerging technologies will continue to replace routine functions across many job categories at all levels, even as they create new opportunities for workers in hundreds of fields, including medicine and healthcare, manufacturing, and communications. These challenges will be amplified by the increasing competitiveness of other nations within the global economy, including the diversifying skill sets of foreign workers.
- And democratic governance will become much more complicated as a result of these demographic and technological changes. Engaged citizens already require real scientific and technological understanding—as well as a working knowledge of history, economics, civics, and the arts—in order to make

informed policy decisions. They also need a set of sophisticated critical thinking skills in order to navigate a media landscape that includes the rapid exchange of information, often at the expense of careful analysis and reasoned debate, and in which fact and fiction are not easily distinguishable. Perhaps most important of all, they need institutions that welcome and protect a robust but respectful exchange of ideas as the basis of all innovation and the very essence of a democracy.

Our educational institutions can and must provide, at scale, the knowledge and skills that are required to help every American make sense of and thrive in a future society that will be even more diverse, technological, and complicated than the present. The pressures on our colleges and universities are particularly acute. A growing proportion of American occupations will require college credentials at the baccalaureate, associate's, and certificate levels because jobs will depend upon increasingly technical bodies of knowledge or because the more general skills and experiences that undergraduate education provides—scientific and civic understanding, critical thinking and “soft skills,” clarity of thought and expression, and the ability to work in teams—will be considered more desirable in every field and profession. A college education also correlates to a host of other outcomes that most Americans find desirable. College graduates enjoy more time spent with their families and prove to be more active in their communities as volunteers. The voting rate among college graduates is nearly twice as high as the rate for high school graduates.⁴ They tend to exercise more and report better health through the course of their lives. College graduates report having more interesting and rewarding work than nongraduates.⁵ And

the economic benefits associated with a college degree are clear: on average, college graduates earn approximately \$1 million more than high school graduates.⁶ Part of this difference is due to college graduates' higher employment rates: for example, in 2016, the unemployment rate for high school graduates was 5.2 percent compared to only 2.7 percent for bachelor's degree holders and 3.6 percent for associate's degree holders.⁷

But to realize the full benefits of an undergraduate education, students must be able to complete their degrees. Our undergraduate institutions, as a whole, are more successful in enrolling students than they are in graduating them. By one measure, only about 60 percent of students who pursue a bachelor's degree actually complete one. Similarly, only about 30 percent who pursue a certificate or associate's degree ever earn the credentials they seek. In addition, completion rates,

To realize the full benefits of an undergraduate education, students must be able to complete their degrees.

when analyzed by gender, race, ethnicity, and socioeconomic status, are troublingly unequal. Women complete at higher rates than men, White and Asian students complete at higher rates than Black and Hispanic students, and high-income students complete at higher rates than their low-income peers. Students who attend part-time, mostly working adults and parents, complete at much lower rates than those who attend full-time. And students from rural areas of the

country lag behind their urban peers. These disparities mirror and reinforce other social inequities, and are an obstacle to social progress. They also represent a significant challenge to an education system that has long prioritized the expansion of access, especially when many who enroll but do not graduate are unable to repay student loan debt and are, therefore, worse off financially than when they started. True equity requires that students from all backgrounds have an opportunity to receive a quality, affordable education and that they can complete their degrees in a reasonable period of time.

The United States now ranks 11th among the 34 Organization for Economic Cooperation and Development countries in the percentage of its 25- to 34-year-olds who hold an associate's degree or higher. Less than half (46.5 percent) of all Americans in this age group hold a degree, compared with 69 percent in South Korea and 59 percent in Canada.⁸ There are many reasons for these differences, including the social, economic, historical, and geographic challenges of serving a nation as large and diverse as the United States. There are also many reasons why an American student might postpone or cease their pursuit of a degree. Indeed, there is no single model for a successful undergraduate experience, and the diversity of educational pathways is a particular strength of the American approach. Nevertheless, now that most high school students have access to some college option, the nation's future success—in business and civic life, at home and abroad—depends on its ability to realize the untapped potential of the many students who begin but do not complete their undergraduate education. The completion of a few college courses is not a sufficient education in the twenty-first century.

Although the public discourse tends to focus on the most extreme examples of burdensome student debt, the larger issues reside with students who take out relatively smaller loan amounts but never earn a credential.

Among the primary obstacles to completion for many students is the sheer cost of an undergraduate degree. Close to 60 percent of all college graduates take out loans averaging a total debt of \$20,000 per student—approximately the cost of a brand-new economy car. But the problem of student debt is far more serious for students who drop out than for students who graduate. While 9 percent of college graduates default on their loans, the default rate among students who do not complete their degrees is almost 25 percent. Although the public discourse tends to focus on the most extreme examples of burdensome student debt, the larger issues reside with students who take out relatively smaller loan amounts but never earn a credential.

Every sector bears some responsibility for addressing these challenges, and the entire nation needs to begin a new conversation about how to distribute the responsibility for undergraduate education. Institutions need to devote far more attention to and support for the quality of teaching and the teaching workforce and become more purposeful, effective, and efficient—reengineering their systems to focus on student completion. At the same time, government agencies need to focus their sights on students and communities in real need. And the private sector, including philanthropies, can help to advance these goals through a variety of partnerships and approaches to assist

undergraduate institutions as they adjust to a growing and shifting student population.

The American Academy of Arts and Sciences organized its Commission on the Future of Undergraduate Education to take a broad view of undergraduate education in all of its manifestations and to recommend ways to ensure that students in every program and institution receive the education they need to succeed in the twenty-first century. In this final report, the Commission offers a comprehensive national strategy encompassing three broad recommendations to achieve this goal:

1. Ensure that all students have high-quality educational experiences.
2. Increase overall completion rates and reduce inequities among different student populations at every level of undergraduate education.
3. Manage college costs and improve the affordability of undergraduate education.

Action on these recommendations can and should begin soon, and many will take 10–20 years before they are realized. The fourth and final section of the report takes a more speculative approach, looking to a further future through the lenses of several factors—each plausible and pertinent to the Commission’s principal goals of quality, completion, and

Our nation’s investment in education has always implied a compact among the generations, in which each generation has accepted some responsibility for the success of the next.

That sustained effort, over 200 years, has resulted in the network of colleges and universities that is among the most significant contributors to America’s intellectual and economic strength, the engines that drive the American Dream.

affordability—which could move in very different directions: our country’s level of social cohesion; the characteristics of the workforce; the level of access to information and educational technologies; and unforeseen natural or human-generated global challenges. The report ends by offering priority research areas to advance the work toward a strengthened and more affordable undergraduate education for a greater share of Americans.

In developing this report, the Commission drew upon a vast array of innovative and important practices, policies, and studies underway across the country, as well as successful projects at every level of undergraduate education. Throughout the report, promising practices are highlighted either in green or included under a green “Promising Practice” banner. Additional promising practices may be found at www.amacad.org/cfue. It assembled evidence supporting the notion that undergraduate education institutions in every sector can achieve meaningful progress as long as they focus on quality and completion as primary goals, limit costs and obstacles in the pursuit of these goals, and partner with other entities to create new efficiencies, share best practices, and build economies of scale.

In time, as teaching methodologies evolve and delivery systems become less expensive and easier to manage, digital technologies will help expand educational opportunities for all students. Some advances, like the growing use of predictive analytics in student advising, are already changing the way institutions serve their students. But such innovations have been local and slow to spread across the higher education landscape. Taking up the challenges of improved performance cannot wait, however; they must be addressed now or risk failing the talented students of today and tomorrow.

A recent, comprehensive research project on social mobility tracked about 30 million college students, charting the percentage from lower-income families who then moved up the income distribution by their early 30s. Among its many findings, the study reveals that open access colleges and universities serve as major catalysts propelling low-income students into middle-class lives. But it also suggests that American institutions of higher education are not meeting their potential.⁹

Our nation’s investment in education has always implied a compact among the generations, in

which each generation has accepted some responsibility for the success of the next. That sustained effort, over 200 years, has resulted in the network of colleges and universities that is among the most significant contributors to America's intellectual and economic strength, the engines that drive the American Dream. Some historians even suggest that America's rise as an economic power, beginning in the nineteenth century and continuing through the 1960s, can be traced to the rapid growth of educational opportunity in the United States, including the expansion of undergraduate education, in contrast to the more gradual broadening of educational opportunity in Europe.¹⁰ We now have the potential to provide every American with an undergraduate degree, but over the past 30 years, the generational compact has weakened, investments have been reduced, and the rate of attainment lags behind our nation's needs.

To better understand the scope of the investments required to reverse this course, and to help measure the benefits of renewed investment, the Commission engaged a leading economic consulting firm, Moody's Analytics. Their analysis indicates that an ambitious yet achievable improvement in college completion rates would require substantial investments over a decade and more, but the longer-term effect on the economy would be a significant improvement in the productivity of the American economy and a resultant gain in the nation's standard of living.¹¹ One model, based on a 20-year projection, forecasts an annual growth in GDP that is nearly 10 percent higher than it would be without the program—an increase large enough to repay initial investments and continue to grow the economy. While the analy-

sis focuses on the economic side of this development, there is every reason to believe that an investment in students would yield other, less easily quantified returns as well, including gains such as greater intercultural understanding, increased civic participation leading to a stronger democracy, and more rewarding lives for graduates. In the same way that the nation must reinvest in its physical infrastructure—roads, bridges, railways, and so on—as a stimulus for communication and commerce of all kinds, the United States should commit to a comparable reinvestment in our existing educational infrastructure, including undergraduate education, in order to realize the productive potential of all Americans.

Ultimately, the future success of the nation will depend on its citizens' level of commitment to a revised, inclusive ideal of an educated society in which every member is well-prepared to succeed and thrive. The national strategy the Commission recommends certainly requires some sacrifices, including sensible investments to assist students in need and to encourage a more concerted national effort to share, adopt, and bring to scale successful programs and best practices that enhance the student experience and spread the benefits of innovation more equitably across the nation. But the costs of such a strategy are far outweighed by the benefits to individual students, to local communities, to the nation, and to the world.

Priority One Recommendations

ENSURE THAT ALL STUDENTS—WHATEVER THEIR PROGRAM OF STUDY—HAVE HIGH-QUALITY EDUCATIONAL EXPERIENCES THAT PREPARE THEM FOR SUCCESS IN THE TWENTY-FIRST CENTURY.

Too little attention is paid in undergraduate education to the educational experience itself and, in particular, to the challenge of ensuring that the 17 million diverse college students in many types of programs are learning and mastering knowledge, skills, and dispositions that will help them succeed in the twenty-first-century United States. Moreover, these students face the growing challenges of a changing and more competitive global economy in which they are competing against highly motivated and trained students throughout the world. For this reason, the Commission's recommendations intentionally begin with the educational experience, with student learning. All college graduates—regardless of their major or the credential they will earn—need their programs of study to impart a forward-looking combination of academic knowledge and practical skills so they are prepared for both economic success and civic engagement. Today, the long-standing debate over the value of a liberal arts education versus a more applied postsecondary program presents a false choice. College educators need to adjust their program curricula and learning expectations accordingly. And students need to see the ability to work and learn with others, and to disagree and debate respectfully, as a skill essential for a high quality of life and a future of economic success and effective democratic citizenship.

The Commission recognizes that advancing the broad learning agenda advocated here—and advocating for more attention to the teaching enterprise itself—will remain difficult until more sophisticated and useful ways of measuring what students actually learn are developed. Redressing this lack of good data is a high priority. The Commission calls for far greater attention to and support for the quality of college teaching and the teaching workforce. Students learn in many different settings, including through peer interactions, co- and extracurricular activities, and self-motivated exploration. Ultimately, though, making undergraduate learning stronger and more rigorous will depend upon how undergraduate education invests in the teaching skills of its faculty and the kind of institutional and systemic commitment that is made.

1 Widespread inattention to teaching quality in the preparation, selection, and assessment of faculty is a major obstacle to improved undergraduate student learning. University systems and individual campuses, academic departments, and disciplinary associations all have roles to play:

a Master's and doctoral programs that produce college teaching faculty should integrate meaningful and explicit teacher training opportunities.

b **Institutions must make a systemic commitment to the improvement of college teaching**, a commitment that acknowledges and rewards good teaching practices that are grounded in the learning sciences and an understanding of the variety of experiences and learning styles students bring to campuses. This commitment will most likely require ongoing review of faculty teaching practices; analyzing the faculty incentive system; making mentoring and other structured resources available to faculty throughout their teaching careers; and including teaching quality as a key part of tenure evaluation and contract renewal decision-making processes. Much of this work must take place in collaboration with academic departments.

c Disciplinary associations should lead research and professional development efforts exploring the relationship between teaching practices and student learning.

2 **Colleges and universities have the opportunity and the responsibility to bring together students from different backgrounds to create intellectual and social connections in ways that sustain and enrich American democracy.** Relatedly, faculty and staff all need training and support to make possible campus cultures and classes that fully encourage active listening, discussion, and debate on controversial topics informed by the rigors of reason and evidence. Colleges and universities constitute one of the most important sites where people from various backgrounds and perspectives interact, learn with and from one another, and grapple with difference. Being prepared to teach in an increasingly contentious and fractured world, where diversity is crucial, is difficult.

3 Recognizing the challenges associated with greater numbers of short-term, nontenure instructors, any effort to improve undergraduate teaching and learning will require **providing nontenure-track faculty with stable professional working environments and careers.** The trend toward increased employment of short-term, nontenure-track faculty in undergraduate teaching will persist as long as colleges are under pressure to keep costs down and universities continue to produce more PhDs in some fields than are likely to find tenure-track employment. Good teaching need not require tenure-track faculty in every case, but it does require that faculty be supported and rewarded for doing their work well:

a **As they hire nontenure-track faculty who concentrate on teaching—a growing share at many institutions across the country—colleges and universities should aim to make these positions full-time with longer-term contracts and a clear voice in governance**, relying less on short-term, part-time instructors. These positions should respect profes-

Strengthen the Student Educational Experience

sional norms of academic freedom and provide a voice in university governance and the opportunity to build successful professional lives with reasonable benefits and job security.

b **Support and integrate faculty who teach on a part-time basis,** and who are recruited for their specialized expertise but who do not necessarily want to pursue an academic track, in a way that suits their more flexible needs.

c **Ensure that faculty from a diversity of backgrounds are equitably represented** across all instructional categories.

4 **All college credentials—certificates and associate’s and bachelor’s degrees—should incorporate academic, career, and civic knowledge and skills as a foundation for rewarding and productive lives and careers.** In workplaces continually impacted by technological advances, employers value graduates who possess a broad technical, social, and entrepreneurial skillset, as well as the ongoing motivation to develop and apply new skills. Employers have a key role in helping graduates obtain these capacities. At the same time, the complexities of contemporary society demand citizens who understand the values and behaviors that lead to active civic engagement and contribute to a healthy democracy. Undergraduate learners need meaningful opportunities to develop and integrate knowledge and skills in the classroom and through cocurricular experiences such as co-op programs and internships, research, international study, or service that can help them improve their economic prospects, effectively navigate their personal and public worlds, and continue to learn throughout their lifetimes. Even in short-duration certificate programs, technical and academic knowledge should be augmented by curricular redesign that strengthens practical skills such as communication, problem-solving, and teamwork.

5 **Develop more reliable measures of student learning gains,** since knowing what students have learned and can do is a critically important measure of college value. The focus on student learning as a means to understand and evaluate the effectiveness of a college credential is a valuable addition to what have traditionally been imperfect proxy measures used in college rankings systems such as admission rates and endowment sizes. However, colleges and universities remain in the earliest stages of finding ways to measure and report on student learning within and across undergraduate institutions, as well as how to best convey aggregated levels of learning to the general public. Learning gains should be disaggregated by subgroups that include socioeconomic status, race/ethnicity, and gender. Greater attention should be paid to

how other countries and their institutions address this problem and seek to measure actual learning in their schools.

6 Further experimentation with strategies for teaching and supporting students in online, “hybrid,” and technology-supported environments, including new models where conventional teaching responsibilities are divided across multiple individuals, is needed to assess their effectiveness and to help instructors teach well in these formats. Online courses and other technology-rich teaching innovations have the potential to offer much greater access, flexibility, and learning opportunities to students. Development of these innovations across undergraduate education, within existing institutions, and through new institutions is still at an early stage with promising potential. However, that potential has not yet been fully realized. Rigorous assessments are rare and high-quality evidence shows mixed results. In general, but particularly for lower-income and first-generation college-goers, existing technology simply cannot substitute for in-person instruction but requires a “high-tech/high-touch” approach.

7 Federal and state government should invest in a research and development strategy that increases the knowledge base regarding new models for designing, delivering, and assessing learning. Given the limited research base and mixed results to date, the Commission supports an evidence-based approach to the introduction of technology-based or technology-assisted education models. Outcomes should be disaggregated by key population groups, particularly those such as low-income, minority, and first-generation students. Results should be freely shared and disseminated across institutions and among researchers.

Priority Two Recommendations

2

INCREASE COMPLETION RATES AND REDUCE INEQUITIES AMONG DIFFERENT STUDENT POPULATIONS.

The Commission envisions a future that depends on most Americans obtaining and benefiting from high-quality undergraduate education. Too few students who start at an American college or university complete their programs, and systematic variations in completion are linked to family income level, race and ethnicity, and gender. Many students who leave college without a degree are worse off than when they entered, unable to repay student loan debt. Low completion rates have been stubbornly resistant to improvement and require a serious redesign of institutional processes informed by data, deep partnerships with other entities, and a supportive state and federal environment. If a quality undergraduate education is the key to opportunity in the twenty-first century—an open door to a wider world—it should not be subject to a means test. The stakes, for individual citizens and for the country as a whole, are much too high. Students who will be entering colleges and universities over the next 20–30 years will come from all cultural, ethnic, and socioeconomic backgrounds; they will earn their education through an expanding variety of modes and institutions, according to schedules of their own making; and they will, like past cohorts, face multiple barriers to success. These students will need to complete their degrees. Colleges and universities, businesses, community-based organizations, and state and federal governments all have a role to play in this massive endeavor. The Commission makes the following recommendations for improvement in areas related to completion.

1 College and university leadership, with the full engagement of faculty and staff, must make completion a top institutional priority, with a clear focus on understanding the diverse needs of students. Institutional resource allocation decisions must be viewed through the lens of whether investments are likely to increase student completion without compromising quality. More large-scale experimentation and research are needed, as is a commitment to continuous improvement by experimenting institutions. Multiple interventions should be integrated in coherent, scalable efforts:

a Data collection should enable institution-specific insights through nuanced analyses and should support rigorous evaluation and careful assessment of completion-related student interventions. Institutions must be able to analyze, compare, and report student-level data on persistence and progression, disaggregated by student characteristics that include family income, first-generation college-going status, enrollment status, race and ethnicity, and gender.

b Students should have opportunities to make meaningful, personalized connections with faculty and staff. There is strong evidence that active guidance and interventions grounded in good data are valuable in promoting student success.

c More attention must be paid to understanding and assisting students from groups with the lowest completion rates. Summer bridge programs, accelerated remediation, and the provision of emergency funds are examples of proven strategies that benefit students who struggle to graduate.

2 Expand experimentation with and research on guided pathways designs, which already help many institutions increase completion and reduce time-to-degree and excess credits. Design elements include clear guidelines for students to earn credentials and to further their education or career employment, mapped so course sequences and postcompletion choices are transparent; faster and better on-ramps to college-level learning for underprepared students; strong, ongoing guidance and mentoring on academic and career decision-making; and technology-assisted advising that keeps students on track to completion. Many of these reforms also have implications for greater efficiency in college and university operations, particularly when measured in terms of cost per graduate.

3 Work toward a new national understanding of and approach to student transfer undergirded by an openness to evaluating, recognizing, and applying college-level learning that takes place at multiple institutions through various models. One-third of college students change institutions at least once, and about half of public university graduates began their studies in community colleges. But many lose credits, do not have their credits accepted, or even drop out along the way, especially students from underrepresented populations. This obligates both public and private colleges and universities as well as state policy-makers to work collaboratively to align learning programs and expectations across institutions and sectors, including implementing a transferable general education core, defined transfer pathway maps within popular disciplines, and transfer-focused advising systems that help students anticipate what it will take for them to transfer without losing momentum in their chosen field. Beyond this, a growing number of providers that are not colleges or universities offer pieces of educational experiences that are comparable to college-level learning. New efforts and strategies are thus required to measure and afford recognition to college-level learning that takes place outside the bounds of traditional and familiar college offerings.

4 Employer partnerships with colleges and universities play an important part in improving college completion rates and helping students understand the relevance of their education to future employment, develop important workplace skills, and explore potential career pathways. Such partnerships—which include internships and co-op programs, mentoring, and research opportunities—also often include curricular consultations to help ensure students are prepared with the knowledge and skills needed for the workforce. New models in which colleges collaborate with businesses and high schools to create curricular pathways and provide professional mentoring and workplace internships to students especially show great promise.

5 Federal and state government leadership should enact comprehensive and coordinated strategies to make college completion a top national and state priority. Both state and federal governments should use discretionary funds to make competitive grants that encourage evidence-based approaches to improving completion, including promoting informed program choices, limiting excess credits, reducing developmental coursework, and redesigning curricula to postcompletion success:

a State leaders should determine their state’s numerical educational attainment goals, communicate and promote these objectives to their residents, and coordinate with colleges and universities and other public and private entities to achieve these goals. More specifically, states can help set meaningful stretch goals for increasing college completion rates; track improvement by population subgroup by utilizing state longitudinal data systems; and support campuses through targeted institutional allocations and student financial aid.

b The federal government should build a student unit record data system—removing identifying information—to understand institutional, state, and national trends on college outcomes.

6 Colleges and universities should provide all college-going students and their families with easy access to accurate and relevant information to inform their college choices, including the actual costs of the academic program to student and family, the likelihood of completing the program, and the prospects for employment or further education after graduation. Given the high sticker cost of college and the difficulty of choosing among myriad possible institutions, programs, and credentials, better information must be coupled with active guidance and support that is personalized and technology-assisted in order to facilitate decision-making and keep students on track, particularly for first-generation students and others with little experience of both college and careers.

7 **Colleges and universities have the responsibility to advance the cause of better precollege education.** The most fundamental way every college and university can help improve P-12 education is to ensure that its own students receive a high-quality education so that graduates who seek a teaching career will have a strong understanding of the subject matter they wish to teach. What a particular college can do depends on its circumstances. Many work directly with teachers and administrations in their local communities to clarify expectations and smooth pathways, create pipeline programs that prepare elementary and high school students for college, and engage in dual-enrollment programs and early college initiatives—all of which can improve college readiness, reduce the need for remediation, and increase college persistence and completion. Some universities have schools of education whose students are a big part of the region’s teaching force, and these institutions need to ensure that their students are well equipped for the work they will take up. The wealthiest and most-selective schools can invest in actively recruiting students from disadvantaged backgrounds throughout the nation and can help neighboring communities to advance opportunities for all college-going youth.

Priority Three Recommendations

3

CONTROL COSTS AND INCREASE AFFORDABILITY TO MAKE UNDERGRADUATE EDUCATION FINANCIALLY ACCESSIBLE TO ALL WHO CAN BENEFIT.

The Commission believes that, no matter how high the quality of an undergraduate education, it cannot serve its purpose if it is not financially accessible to all who can benefit. In an environment of continuing financial constraint, colleges and governments must put their limited resources where they will do the most good in realizing this commitment. In the Commission's view, this means targeting institutional operating funds toward programs that promote efficiency and effectiveness in getting students to completion and targeting state and federal support to students who need it most in the programs in which they are most likely to succeed. Increasing the rates at which students succeed in completing their undergraduate programs in a timely way is likely the best antidote to unmanageable student debt. Across-the-board spending cuts are good at avoiding tough choices, but deliberate decisions about where to invest and where to cut back have much greater promise for controlling costs while promoting quality and completion. More broadly, while addressing the challenge of low success rates for a significant portion of the population will require significant investments in the near term, in the long run it will return significant and measurable long-term economic and civic dividends. Strengthening college completion should be seen as an investment in human infrastructure that is critical to the nation's long-term economic vitality and social cohesion.

The Commission makes the following recommendations for improvement related to controlling costs and increasing affordability.

1 The federal student grant and loan programs play a valuable—in fact, irreplaceable—role in the American system of financing higher education, but the nation's aid system is far more complex and confusing than it needs to be, and too much public money is being wasted. The recommendations below should be complemented by more comprehensive interventions that help students understand the potential earnings and debt levels associated with various college credentials and career paths, prevent students from excessive borrowing, and encourage students to complete their credentials in a timely way. The federal government should:

a Take further steps to **simplify or even eliminate the FAFSA-based student aid application process**, relying more on financial information already available from the Internal Revenue Service to determine eligibility.

b The Pell system should provide grants that support students completing 30 credits anytime throughout the course of a calendar year, allowing students to take classes when they can and to complete their credentials in a timely fashion.

c Design a single income-driven repayment plan in which students are automatically enrolled and loan payments are collected through the income tax system. The plan should include fiscally responsible repayment rates to limit the need for future debt forgiveness.

d Develop guidelines for colleges and universities whose students are systematically unable to repay their federal loans to reimburse the government a fraction of the unpaid balance. Institutional risk-sharing that gives a college or university a financial stake in their students' success at school and afterward appears to be a promising innovation and should be tested, provided that institutions continue to honor their access-related missions and stand behind their commitments to high-risk students.

e Track student progress across institutions and provide access to continued aid based upon satisfactory academic progress across multiple institutions. Under the current system, too many “swirling” students move from institution to institution piling up debt without earning a degree, resulting in significant debt and high risk of loan default.

f Revise eligibility rules so as not to allow federal financial aid to follow students to low-performing institutions that have extremely low graduation rates.

g Develop incentives for states to sustain funding for public higher education institutions and, where possible, to increase it. Federal and state governments should focus their dollars on comprehensive supports and incentives to improve the chances of students from low- and moderate-income backgrounds earning college credentials of value.

h Experiment with and carefully assess alternatives for students to manage the financing of their college education. For example, income-share agreements allow college students to borrow from colleges or investors, which then receive a percentage of the student's after-graduation income.

2 The states historically have exercised primary responsibility for funding and oversight of public colleges and universities, and this core state responsibility should continue—it is a duty states owe to their residents, as the majority of those who go to college attend their local public higher education institutions. States must ensure that their public institutions are provided with adequate funding to fulfill their missions, in particular those that serve the most disadvantaged students. However, an overall decline in state support represents a central challenge to the core missions of public institutions. Fiscal pressures on states and on state-run colleges and universities are likely to be unrelenting, and it is essential that both government decision-makers and leaders on campus focus on directing resources to the highest priorities:

a **Direct scarce resources to the students for whom they will have the greatest impact.** State governments must weigh carefully the balance of their funding across types of public institutions, recognizing the distinctive contributions made by research universities, regional comprehensives, and community colleges. Because the roles of these different types of institution vary greatly, as do the backgrounds and aspirations of their students, no simple formula can determine how much support each institution should receive from the state. While the balance of priorities will and should vary among states according to a state's needs and opportunities, the Commission believes that every state should attend effectively to the needs of its most disadvantaged students, wherever they enroll.

b **State-run student aid programs should prioritize meeting the financial need of highly disadvantaged students.** Without additional funding to supplement federal grant assistance, many qualified students may be unable to attend the public flagship or even a nearby community college.

c **Policy-makers should work with colleges and universities toward improved alignment between funding and program completion.** Performance-based funding systems are showing mixed results; continually evaluating these systems and modifying them based on evidence of effectiveness and unintended consequences holds real promise.

d **Coordinate state agencies in developing comprehensive student support strategies.** Many students, whether coming straight out of high school or adults returning later to college, face multiple social and personal challenges that can range from homelessness and food insecurity to childcare, psychological challenges, and even imprisonment. The best

solutions can often emerge from building cooperation between a college and relevant social support agencies. These are innovations that states can do a good deal to support and even subsidize.

3 In the constrained financial environment that exists now and that the Commission believes lies ahead, colleges and universities must continue to be more effective at managing their costs and directing scarce resources smartly if they are to meet the goals of more equitable access and increased completion. Building on the difficult and serious steps many institutions have already taken, the following areas deserve particular emphasis:

a **Invest in providing students with consistently good teaching.** Good teaching raises student learning and satisfaction and raises persistence in challenging majors, as well as degree completion. Once in place, strong and effective instructional systems can better meet institutional and social goals without being more expensive than the less-reliable teaching practices they replace.

b **Build governance practices that support cost-saving innovation.** Colleges and universities of all types need to develop a more robust conception of “shared governance” than has historically been the case. Even though faculty, administrators, and trustees view the institution through different lenses, they share an interest in the institution’s financial success and, even more, its vitality in achieving its mission. Achieving shared goals will require greater openness and more candid discussion among all parties than currently prevail.

c **Reduce costs per graduate through timely progression to degree completion.** Institutional reengineering that results in more students completing degrees in a timelier fashion lowers costs per graduate because of the greater effectiveness in producing graduates. Success requires the full effort of the entire campus, including the faculty, in making efficiency-improving adjustments; for example, through timely tracking of student progress.

d **Direct financial assistance to students who need it.** Colleges and universities should assess their student aid strategies to meet institutional missions and lean toward providing aid to students who are most financially vulnerable.

e Make information about prices, aid, and outcomes more accessible and transparent to students. Institutions should think carefully about clarity and equity for students as they design their pricing policies.

4 Federal and state regulatory agencies, as well as regional and disciplinary accrediting bodies that also hold regulatory sway, should assess institutional effectiveness and guide behavior based on desired practices and outcomes for students rather than focusing primarily on educational inputs:

a To promote an increase in responsible innovation, government and accrediting agencies should **track institutional and program performance on priority outcomes** such as graduation rates, student debt default and loan repayment rates, and job placement/job success or further education outcomes.

b To reduce compliance costs and target resources where they can have the greatest impact, **apply more thorough institutional review to chronically poor performers and reward strong performers by reducing the frequency and scope of regulatory review processes.** Reporting requirements should be simplified where possible and better targeted to control bad actors and to assess the quality of new entrants into higher education.

c Increasing numbers of colleges and universities struggle to meet costly federal and state regulatory requirements. The federal and state governments should take steps to **consolidate and streamline confusing regulations, review and reduce unfunded mandates where appropriate, and eliminate extraneous and tangential rules while retaining and where possible improving worthwhile consumer protections.** Regulations, put forth in a clear and comprehensible manner, should be related to education, student safety, and stewardship of federal and state funds. The costs and burdens of regulations should be estimated accurately and regularly.

The fourth section of the report considers a distant future through four lenses: the country's level of social cohesion; the needs and characteristics of the workforce; the use of Big Data and the level of access to information and advanced educational technologies; and unforeseen natural or human-generated global challenges. The Commission focuses on these factors because they seem the most plausible and pertinent to its principal concerns of quality, completion, and affordability. Speculating on a range of possibilities, the Commission imagines what the nation's needs may be and how colleges and universities might respond:

1 In a future that may lean toward greater social division, colleges and universities should play a large and constructive role in promoting greater cohesiveness. As cultural crossroads and sites of reasoned debate, they could set new standards for civility and mutual understanding in a society sorely in need of new models. An increasingly fractured nation will require more common spaces and more opportunities for meaningful interaction, whether they exist physically or virtually.

2 Advanced robotics, artificial intelligence, and enhanced and virtual reality technologies are all evolving so rapidly that many of the tasks now performed by humans may increasingly come to be performed by machines, while a growing “gig economy” could mean a significantly greater share of the workforce hired on a task-by-task basis. Colleges and universities will need to meet the demand for more shorter-term, flexible options available to students over a lifetime that support a highly skilled, technical, and adaptable workforce. But institutions must also double down on teaching the skills that are most difficult for machines to replicate, such as solving unstructured problems, working flexibly with new information, and working effectively in groups.

3 The amount of data collected by technology giants like Google, Facebook, and Amazon on their users is seemingly boundless, while the growth in smartphones and tablets along with the digitization of libraries is making information available across the world at the touch of a screen. Colleges and universities will need to define their own parameters for the collection and use of student data, balancing privacy concerns with the potential of Big Data to help refine and personalize teaching and advising. Colleges and universities may even take the lead in the public debate about the proper use of personal data more generally. The continued expansion of online lectures, digitized textbooks, and wikis of all kinds would not only continue to make information more widely available but could also speed the evolution of teaching.

4 The era of the iPhone and the rise of social media have been accompanied by global terrorism, the Great Recession, and an acceleration in the degradation of the natural environment. Colleges and universities are well positioned to help society respond thoughtfully and effectively by examining new ideas, teaching new skills, and producing new research. Their importance will only be amplified in a future characterized by transformative discovery or world-changing cataclysm, and they would serve the world more effectively by maintaining a certain level of financial, curricular, and intellectual flexibility in order to meet unforeseen challenges.

Whatever combination of these scenarios should come about—or whatever else comes about that we have not anticipated—the fundamentals of strong undergraduate education this report has identified will continue to be important:

- High-quality teaching and learning that addresses both students' practical career needs in conjunction with their more lasting capacities for critical thinking, problem-solving, communication, and civic participation.
- An educational system that does as much as possible to put students in a position not only to access higher education, but also to succeed in the programs they undertake.
- Ensuring that educational opportunities are widely available to all who can benefit.

CONCLUSION

Some members of this Commission have a deep knowledge of one or another piece of the higher education landscape—perhaps public or private research universities, or community colleges, or institutions with large online or competency-based delivery systems. Others brought perspectives on undergraduate education from other walks of life—business, technology, journalism, and public affairs. But none

serving the needs of individuals, or a public good, meeting larger civic and community needs. The answer, we are convinced, is that undergraduate education is both a public and a private good. Those who invest in an education are consistently rewarded with higher earnings and more stable employment—important private benefits. The earnings advantage for college graduates, on the average, has in

Our primary goal in writing this report, therefore, has been to help guide the next stage in the evolution of American undergraduate education, in which all students can afford, complete, and enjoy the benefits of the education they seek when they enroll, an education that truly prepares them for life in the 21st century.

of us, even the few who study higher education for a living, had the full picture of this complex and ever-changing mosaic. And we still don't. This is a system that will not sit still with its millions of diverse students, thousands of institutions, and continual adoption of technological and organizational innovations as society's needs for education evolve in a changing global economic and political context. Our collective learning and analysis have left us with a sober sense of the great challenges ahead for undergraduate education—intellectual, financial, and ethical—and much of this report aims at clarifying their nature and scope and proposing effective responses to them. Most of all though, as we complete this stage of our work, we come away hopeful.

There is a long-standing debate about whether undergraduate education is a private good,

recent decades been higher than ever before. Expanding the numbers of degree and certificate holders helps individuals and also honors America's self-understanding as a nation of economic opportunity and strengthens our democracy. Our primary goal in writing this report, therefore, has been to help guide the next stage in the evolution of American undergraduate education, in which all students can afford, complete, and enjoy the benefits of the education they seek when they enroll, an education that truly prepares them for life in the 21st century. Beyond the benefits to individuals, though, we also know that more educated communities are more prosperous and have a richer civic life—real public benefits of undergraduate education.

As we have explored these benefits more deeply, we have come to identify a more pro-

Progress is not guaranteed, and good things will happen only with sustained effort, but if we can sustain focus on the work, combining patience with urgency, we can, through undergraduate education, make great advances as individuals and as a nation.

found role that undergraduate education can and indeed must play for the sake of our nation's future. We are a nation polarized—by race, by class, by political and religious convictions, and in other ways. We must, even as we acknowledge and respect difference, find opportunities to knit people and communities together on terms of equality and mutual respect. This is not a problem undergraduate education can “solve,” but colleges and universities are among the few American institutions in which significant numbers of people from different backgrounds and communities come together for a shared purpose. At this juncture, our divisions sometimes produce painful and risky confrontations, but they also, less visibly, create opportunities to build relationships and further mutual understanding. This is, in our view, a core component of education and a crucial need for our civic and political future.

We face huge challenges. Yet the reasons for optimism are real. Our remarkably large set of colleges and universities has a greater reach across our population than ever before. For all the challenges and tensions evident on many of today's campuses, we must remember that the long-run trend on campuses has been toward more diversity and inclusion. We harbor no doubts about the value and benefits of a quality college education—it delivers on its promises of greater individual and social prosperity. We

are hopeful because more and more colleges are learning how to help students succeed in moving to complete their programs and are developing effective practices that other colleges can emulate. And we are hopeful because there are real financial changes and technological opportunities that, if enacted smartly, can further facilitate student success. Progress is not guaranteed, and good things will happen only with sustained effort, but if we can sustain focus on the work, combining patience with urgency, we can, through undergraduate education, make great advances as individuals and as a nation.

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APPENDIX A

Commission Members, Staff, and Funder

COMMISSION ON THE FUTURE OF UNDERGRADUATE EDUCATION

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Funder

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APPENDIX B

Groups and Individuals Consulted

STUDENT AND FACULTY DISCUSSION GROUPS

The Commission met with nearly 200 students and faculty members to gather perspectives and discuss concerns about the future of American undergraduate education.

September 15, 2016
Northeastern University
Boston, MA

September 20, 2016
LaGuardia Community College
New York, NY

February 6, 2017
University of Texas, El Paso
El Paso, TX

April 11, 2017
Babson College
Wellesley, MA

April 18, 2017
Eastern Connecticut State University
Willimantic, CT

April 24, 2017
University of Wisconsin-Madison
Madison, WI

April 25, 2017
Rasmussen College
Chicago, IL

MEETINGS WITH ACADEMY MEMBERS AND AFFILIATES

The Commission met with more than 50 Academy members and experts to discuss the work of the Commission.

May 19, 2015
New York, NY

May 20, 2015
Cambridge, MA

June 4, 2015
Chicago, IL

June 16, 2015
Washington, DC

July 1, 2015
Stanford, CA

November 13, 2016
Los Angeles, CA

December 12, 2016
New York, NY

February 7, 2017
Austin, TX

April 19, 2017
Cambridge, MA

Groups and Individuals Consulted

CONGRESSIONAL VISITS

The Commission met with 21 members of Congress and their key legislative advisors. Of the individuals consulted, 47 percent were Republicans, 53 percent were Democrats, 38 percent were from the Senate, and 62 percent were from the House of Representatives.

September 13–14, 2016

October 3–4, 2016

March 30–31, 2017

HIGHER EDUCATION ORGANIZATIONS AND FOUNDATIONS

The Commission met with 25 leaders and staff from national higher education groups and foundations, including:

- American Association of Community Colleges
- American Association of State Colleges and Universities
- American Council on Education
- Association of American Universities
- Association of Public and Land-grant Universities
- The Bill & Melinda Gates Foundation
- Center for American Progress
- Knight Foundation
- Lumina Foundation
- National Association of Independent Colleges and Universities
- National Center for Higher Education Management Systems
- New America
- The Public Policy Institute of California
- State Higher Education Executive Officers Association
- Western Interstate Commission for Higher Education

ROUNDTABLE DISCUSSIONS

March 21, 2017

Boulder, CO

Commission members met with educational technology experts, including **David Figlio** (Northwestern University), **Charles Isbell** (Georgia Institute of Technology), **Stephen Kosslyn** (Minerva Schools at KGI), and **Peter Smith** (University of Maryland University College), about the role of technology and online programs in undergraduate education.

March 29, 2017

Washington, DC

Commission members met with experts on higher education–workforce partnerships, including **Wes Bush** (Northrop Grumman), **Brian Fitzgerald** (The Business-Higher Education Forum), **Dane Linn** (Business Roundtable), and **Stan Litow** (IBM), about ways for the business community to support underserved students and specific examples of programs that could be scaled or replicated.

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