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Preparing Missourians to Succeed: A Blueprint for Higher Education

Preamble

The private and public benefits of higher education are the building blocks of a vibrant society and thriving economy. Education gives individuals the skills and knowledge they need to be economically independent and intellectually engaged in the broader society. Scholars agree that broad access to education was a major factor in the United States' economic dominance in the 20th century and in the creation of the American middle class.

Greater educational attainment produces private benefits, such as higher personal incomes, but also results in significant public benefits, too. The benefits of faster economic growth accrue both to those who went to college and to society as a whole. College graduates enjoy greater lifetime earnings and typically pay more taxes than individuals without a postsecondary degree. According to the Pew Research Center, over a 40-year career a typical adult with a bachelor's degree will earn \$650,000 more than an individual who has only a high school diploma.

Along with higher income, people with more education generally have more leisure time, better outcomes for their children and improved quality of life. They are more likely to have jobs that provide health insurance and retirement benefits than workers without college educations. They have better access to preventative health care, leading to longer and healthier lives. They rely less on government social programs, and are less likely to be incarcerated, thus reducing costs to government.

| | Have Health Insurance | Receive Food Stamps | Regularly Vote | Regularly Volunteer |
|------------------------------|-----------------------|---------------------|----------------|---------------------|
| <i>High School Graduates</i> | 55% | 8% | 55% | 18% |
| <i>College Graduates</i> | 84% | 1% | 79% | 42% |

Equally important is that a democratic political system relies on an informed citizenry equipped with critical thinking and reasoning skills. The problems of modern society are complex, and citizens are asked to sift through many different sources of information in order to make informed decisions.

Research has shown that college graduates are more motivated to vote and exhibit a broad range of intellectual and academic skills to help them in making informed decisions. They are more likely to participate in activities that affect society and the political structure, volunteer for community service; develop a greater appreciation for the arts; engage in activities that promote racial understanding; and possess basic values that are common across racial and ethnic categories.

For future generations of Missourians to prosper, all students must have access to multiple options for high-quality postsecondary education, including two-year colleges, four-year universities, proprietary institutions, career and technical education centers, and on-line programs taught by well-prepared professional educators.

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Gone are the days when a college education was defined strictly in terms of a bachelor's degree. Today, educators, economic development experts and employers agree that postsecondary education includes a variety of options leading to award of professional certificates and two-year, four-year, master's and doctoral degrees.

These postsecondary education programs must be designed to meet the needs of students in the communities in which they live and the workforce that they support with their knowledge and skills.

During the past decade, Missouri has made significant progress in providing unfettered access to higher education. Educators have aligned curriculum, kept tuition below the national average, extended financial aid outreach, worked to improve educator preparation, developed new ways of delivering educational programs, collaborated to reduce costs and time to completion, and taken many other steps to assure students can enroll, persist and complete.

Although Missouri's efforts have resulted in an increasing number of working-age adults who have earned a degree or certificate, more must be done to provide all Missourians with the opportunity to earn a postsecondary credential.

To realize this vision, Missouri must adopt a holistic approach to education, one that not only maximizes the depth and breadth of coordination, collaboration and cooperation within the system of higher education but between all educational sectors and their partners in government and business. Citizens, educators, government officials and thought leaders in the economic sector must be willing to commit the resources needed to encourage change and innovation on Missouri's college campuses.

The Blueprint Process

The Coordinating Board, in concert with a steering committee composed of 36 of Missouri's foremost thought leaders in education, government and business and industry, reviewed reports, received briefings from subject-matter experts and listened to more than 100 witnesses during nine public hearings conducted in every region of the state between December 2014 and June 2015. Findings and recommendations are organized around five specific goals that form the framework of the Blueprint for Higher Education:

- Goal 1: Expand opportunities for educational attainment
- Goal 2: Keep college affordable
- Goal 3: Deliver quality and excellence
- Goal 4: Advance research and innovation to spur stronger economic and community development
- Goal 5: Increase investment in higher education through advocacy and powerful partnerships

The five goals, shaped in part by engaging Missouri citizens in a public dialogue and adopted by the Coordinating Board for Higher Education, contain within them the watchwords that will guide the board and the Missouri Department of Higher Education as they seek to fulfill their mission for Missouri's system of higher education in the days ahead: attainment, affordability, quality, research and innovation, advocacy and partnerships.

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The goals form the foundation for future conversations with elected officials, government agencies, community and business leaders, as well as providers and consumers of higher education about the kind of state Missouri needs to build for future generations. Each goal, along with strategies to support each one, is described in this Blueprint for Higher Education.

NOTE: *Strategies in italics represent “game-changers” with the potential to have the greatest impact on results.*

Attainment

Goal 1: Missouri will increase the proportion of working-age adults with high quality, affordable postsecondary credentials to 60 percent by 2025.

Issues and Challenges

The nation’s economy is undergoing rapid and radical transformation and the future prosperity of Missouri depends on a decisive response by higher education.

The evidence of this transformation is all around us.

According to the Georgetown University Center on Education and the Workforce, by 2020 more than 60 percent of all jobs in Missouri will require postsecondary education and training beyond high school. One third of those jobs will require at least some college, an associate degree, or a postsecondary vocational certificate; 22 percent will require at least a bachelor’s degree; and about one in 10 will require a master’s degree or better. ([Recovery: Job Growth and Education Requirements through 2020](#)).

Of Missouri’s top 50 high-wage occupations projected to have the most job openings by 2018, 34 (68 percent) require at least a bachelor’s degree. Ninety-two of the 100 highest wage occupations projected by 2022 will require at least a bachelor’s degree. Fifteen of the 20 highest paying occupations will require a master’s degree or higher. Thirty of the 100 highest wage jobs will require a doctorate or professional degree. In all, the Missouri Department of Economic Development projects about 98,134 openings in these 100 occupations. DED analysts project 920,067 openings in all occupations by 2022, of which 295,381 (32 percent) require at least some postsecondary education.

While increasing educational attainment is vital to the future of Missouri, the type and quality of degrees and how those degrees translate into employment opportunities also must be considered. DED has identified seven high-demand workforce development areas considered essential to the state’s economic future:

- Advanced manufacturing
- Energy solutions
- Bioscience
- Health sciences and service
- Information technology
- Financial and professional services
- Transportation and logistics

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Many of these jobs are classified as STEM occupations, focused on science, technology, engineering and mathematics. More than 90 percent of the STEM jobs in Missouri require education and experience beyond high school – 70 percent require a bachelor’s degree or higher.

A report by Georgetown University’s Center on Education and the Workforce reinforces Missouri’s need to increase college attainment rates. According to the report, *Good Jobs are Back: College Graduates are First in Line*, jobs that pay more than \$53,000 with benefits annually, have grown the most as the United States recovered from the Great Recession. Nearly all of those “good jobs” are going to college graduates.

Many Missouri students who attend college are not prepared for the rigors of postsecondary education. In 2015, only 44 percent of Missouri seniors taking the ACT met the college readiness benchmark in mathematics. In English, 71 percent met the benchmark. In total, more than 30 percent of high school graduates entering college were enrolled in remedial education classes that cost money and do not result in earned credits.

Improving Missouri’s college completion rates is key for the state to meet its higher education needs. Currently, 37.7 percent of students at two-year colleges earn an associate degree or transfer to a four-year college within three years, and 55.3 percent of students at four-year schools earn a bachelor’s degree in six years. These completion rates must improve dramatically if Missouri is to achieve a workforce that is sufficiently prepared to sustain its economy in the long run.

While the percentage of Missourians earning degrees has increased in recent years, some students – especially those from low income groups, minorities and those who would be first-generation college students – continue to be under-represented in higher education.

- Nationally, in 2012, about 36.4 percent of African-Americans 18-24 years old were enrolled in college, compared to 42.1 percent of whites.
- Student persistence – the percentage of first-year, full-time students returning to college for a second year – and graduation rates also are lower for minority students than for white students.
- At Missouri’s public two- and four-year colleges, the persistence rate from 2013 to 2014 for African American students was 65.2 percent, compared to 78.7 percent for white students.
- According to the Midwestern Higher Education Compact, the 2011 graduation rate for African American students attending Missouri’s public four-year institutions was 33 percent, compared to 57 percent for white students. Between 2009 and 2011, the graduation rate for African American students declined by two percentage points.
- African Americans also are under-represented among Missouri’s faculty ranks. In 2013, just over 5 percent of the full-time faculty at the state’s colleges and universities was African American. About 330 faculty members were African American, compared to nearly 6,300 white faculty members.

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Missouri must take positive actions to close these gaps to provide more opportunities in education for all Missourians and meet the state's workforce needs.

Progress

Given the evidence, no wonder the governor and the Coordinating Board for Higher Education have set an ambitious goal – Missouri's Big Goal – for 60 percent of the state's working age adults to have a two- or four-year degree or high quality certificate by 2025. This document is higher education's blueprint for achieving that goal.

If Missouri is to reach its 60 percent goal, the state will have to gain about 200,000 additional working-age adults (age 25-64) with a postsecondary certificate or degree by 2025.

The percentage of working-age adults in Missouri with a postsecondary credential is growing, albeit slowly. By 2014, about 38.1 percent of adults age 24-65 had earned a two- or four-year degree, up from 33.2 percent in 2005. Degree attainment among young adults is occurring at a greater rate. About 42 percent of Missourians age 24-35 have earned an associate degree or higher, an increase of 7 percentage points since 2005. When professional certificates are included, the percentage of working-age adults with a postsecondary credential rises to about 50.6 percent.

Since 2010, Missouri has undertaken, with the support of the governor and state legislature, several initiatives intended to increase educational attainment while enabling more students to complete sooner and at less cost. These initiatives include coordinating programs to assist students with applying to college and completing the Free Application for Federal Student Aid (FAFSA), reducing the need for remedial education, strengthen advising services for students requiring additional assistance in "gateway" courses, pursuing sensible alternative pathways to complete math requirements, and assuring seamless transfer of credits between institutions for students transferring to another institution to complete their education.

Remedial education, which all too often has resulted in poor retention rates in previous years, is finally showing signs of major improvement. The Missouri Department of Higher Education has worked closely with colleges and universities to adopt best practices in remedial education as an important step to improve student retention and success, and the institutions have responded. The percentage of students enrolled in remedial education classes dropped from 35.6 percent in 2013 to 27.4 percent in 2015 – a decrease of 8.2 percent – following several years with little to no change. With more resources, institutions could make faster progress in effecting needed higher education reforms.

Strategies to improve attainment:

1.1 Implement new policies and initiatives that help all students earn a degree or certificate in less time and at less cost, while enabling graduates to enter the workforce sooner. Tactics:

- *Eliminate remedial education in favor of co-requisite models and similar proven methods.*
- *Develop clear and lower-cost pathways to degrees and certificates.*
- *Expand agreements to support the seamless transfer of academic credits.*

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- *Expand the use of alternative modes of delivery, including early-college programs, online, credit for prior learning, and competency-based education.*
 - *Organize an information campaign to encourage students to seek full-time enrollment (defined here as 15 credit hours a semester).*
- 1.2 *Establish a competitive grant program to help institutions transition to proven completion strategies that can assist Missouri in achieving its Big Goal for Higher Education.*
- 1.3 Raise the postsecondary education participation rates of traditional students. Tactics:
- Increase efforts to assist students in completing college admissions and financial aid applications.
 - Increase collaboration among higher education institutions and high schools to help students begin planning earlier for college and careers, with assistance from the state departments of higher education and elementary and secondary education.
- 1.4 Seek participation in flexible educational programs by adult students, including veterans; individuals seeking new job skills; and those with some college but no degree. Tactics:
- Make a concerted effort to increase the number of adult learners re-entering educational programs leading to the award of a postsecondary credential.
 - Ensure working and place-bound students have adequate academic, career development and support services to complete a college credential.
- 1.5 Reduce disparities for students and faculty at Missouri's colleges and universities. Tactics:
- Raise completion rates by race, ethnicity, socioeconomic status, gender and disability by 50 percent by 2025.
 - Increase efforts to recruit and retain faculty that reflect the diversity of the state.
- 1.6 Encourage increased collaboration between education and business partners to provide students more opportunities for career exploration that will lead to improved completion and placement rates.

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Affordability

Goal 2: Missouri will rank among the 10 most affordable states in which to obtain a postsecondary degree or certificate by 2025.

Issues and Challenges

A postsecondary credential is a good value in Missouri. However, even the best value is of little significance if students cannot afford to gain access to the postsecondary education system. Missouri must ensure that students have the means – through institutional, state and federal financial aid, and family contributions, as well as institutional efficiency and effectiveness – to pay for their education while minimizing student loan indebtedness.

Missouri colleges and universities have kept tuition increases among the lowest in the nation in recent years; however, higher education costs continue to be a challenge for many students and their families.

During the past 15 years, state support of postsecondary education has faced substantial hurdles. Two major economic recessions, one of which was the most severe since the Great Depression, and waning belief in the public benefit of postsecondary education have resulted in a steady decline in financial support for higher education. Between 2000 and 2013, state support for higher education declined by more than 20 percent even before adjustments for inflation. The result has been increased class sizes, continuing dependence on outdated classroom and laboratory technologies, and a greater reliance on adjunct faculty. In addition, tuition and fees have surpassed state support as a percent of revenue received by most institutions.

From 2009 to 2013, tuition and fees increased 10.1 percent for students attending public four-year institutions, 14.6 percent at public two-year institutions (in-district), and 13.9 percent at private four-year institutions.

State student financial aid has not kept up with need. In academic year 2012-2013, the average award provided by the Access Missouri grant – the state’s only grant based on students’ financial need – was just over \$1,100, ranking Missouri 33rd among all states. While the grant amount was increased for the 2015-2016 academic year, the program was funded at just 65 percent of the maximum amount allowed by state statute.

Rising tuition and flat or declining student aid increases the likelihood that more students will rely on borrowing to finance their postsecondary ambitions. About 63 percent of all postsecondary students in Missouri graduate with student loan debt. Although below the national average, the average student loan debt for Missourians attending public and independent four-year institutions is approximately \$25,500, ranking the state 33rd in the nation.

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Progress

Missouri has employed various means to address the affordability of higher education.

Each year, the Missouri Department of Higher Education produces thousands of publications to provide information about financial literacy, federal and state student aid, and actions families can take to prepare for the cost of education beyond high school. The department also is pursuing several initiatives to promote and assist with completion of the Free Application for Federal Student Aid (FAFSA), which is often the gateway to financial aid at all levels.

Missouri does not have a centralized process for setting tuition rates as is seen in many other states. Tuition rates are set by the governing board of each public higher education institution in Missouri based on the unique needs of each institution. That does not mean there has not been state interest in tuition increases.

In 2007, the Missouri legislature passed and the governor signed the Higher Education Student Funding Act (HESFA), which gives the Coordinating Board for Higher Education and the commissioner of higher education a role in reviewing the tuition setting process. HESFA establishes a linkage between institutional tuition increases and the Consumer Price Index (CPI).

These initiatives, combined with agreements between the governor and the public institutions to hold the line on tuition increases, have made Missouri higher education more affordable. In-state tuition and fees at Missouri public four-year institutions rank 13th lowest as a percent of median family income. Tuition increases in this sector during the past five years have been among the lowest in the nation. In-district rates at public two-year institutions are 16th lowest (although not all states have community college districts). Independent four-year institutions are ranked 24th lowest in this category.

Although awards to students through the state's student aid programs have not kept pace with cost increases, the state has continued to invest in student assistance in several important ways. In Fiscal Year 2015, Missouri invested nearly \$110 million in student aid, providing assistance to more than 70,000 students.

Of the students that receive an award through the Access Missouri program, nearly 50 percent are in the highest need category, equating to an Adjusted Gross Income for the family of less than \$35,000. The A+ Scholarship program continues to provide access to postsecondary education to thousands of students that might never have attended otherwise.

Research has confirmed that students that receive awards through the state's student assistance programs persist and graduate at significantly higher rates than those who do not receive awards.

According to a recent report from the Center for American Progress, the link between debt and educational attainment is too frequently missing from the discussion on student loans and loan defaults. While the level of total student debt is a concern, such as the more than \$1 trillion that Americans currently owe, not all student loans are inherently bad. The major issue is whether students who borrowed completed their education.

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Borrowers who earn a degree are much less likely to default on their loans than those who do not. Students who drop out of college represent an estimated 60 percent of all people who default on their loans. Consequently, the state's focus on improving postsecondary completion is one of the most promising avenues available to manage student debt.

Strategies for keeping college affordable

- 2.1 *Convene a new state student financial aid task force to make recommendations for making the system more balanced, responsive and efficient in the use of state funds devoted to financial aid. The task force should include representation from the governor, the Missouri General Assembly, all postsecondary education sectors and the Department of Higher Education.*

NOTE: The task force should evaluate the effectiveness of current programs, the balance between need-based and merit-based support for students, and the alignment of financial aid programs with identified state goals. The task force also should study the need for new or substantially revised existing programs designed to cover the cost for up to the first two years of postsecondary education at public community colleges and significantly reduce the tuition cost for students at all institutions, as well as incorporating sufficient flexibility and inclusiveness to respond to a variety of enrollment options, including online programs and early college courses for high school students.

- 2.2 *Form a robust state-level work-study program designed to provide real-world job experience and promote skill development, including "essential skills" that are highly sought after in the workplace and in life.*
- 2.3 Study the establishment of an "emergency aid" program for students experiencing sudden and unforeseen issues with financing costs beyond tuition and fees that threaten their ability to stay in school. Adopt best practices for establishing such programs at the institutional level.
- 2.4 Establish a Higher Education Trust Fund to create a stable, dedicated mechanism for making earlier student financial aid decisions consistent with the college cycle of applications, acceptance letters and financial aid award announcements. The trust fund would enable the governor and the Missouri General Assembly to set aside appropriated funds on a fiscal schedule that would make the financial aid award programs more efficient and predictable for students and families.
- 2.5 Implement a web-based student portal that will serve as a one-stop shop for information about higher education, including applications, FAFSA rules, state student aid eligibility, transfer policies, reverse transfer, transfer course library, and other information to help students and plan for higher education and complete a degree in less time and at less cost.

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- 2.6 Support initiatives to fund public higher education sufficiently to move “per full-time-equivalent student” funding to the national average.
- 2.7 Enlist private sector support to develop a public information campaign that emphasizes the necessary role families play in financing the cost of postsecondary education for their children. The campaign should highlight the tools available to assist them in meeting that challenge, including MOST (Missouri’s 529 savings program), financial literacy programs and available sources of student financial assistance.
- 2.8 Recommend best practices for streamlining and/or combining common institutional functions across multiple public institutions in such areas as purchasing, human resources and IT systems, and develop a mechanism to highlight institutional progress in improving efficiencies.

Quality

Goal 3: Missouri will produce graduates with high-quality postsecondary degrees and certificates that are valuable and relevant to individuals, employers, communities and the state.

Issues and Challenges

While increasing college completion rates is vital to Missouri’s future, it cannot come at the expense of academic quality. Missouri must maintain high academic standards to ensure its degree and certificate programs are recognized for their rigor and value and strive for continuous improvement.

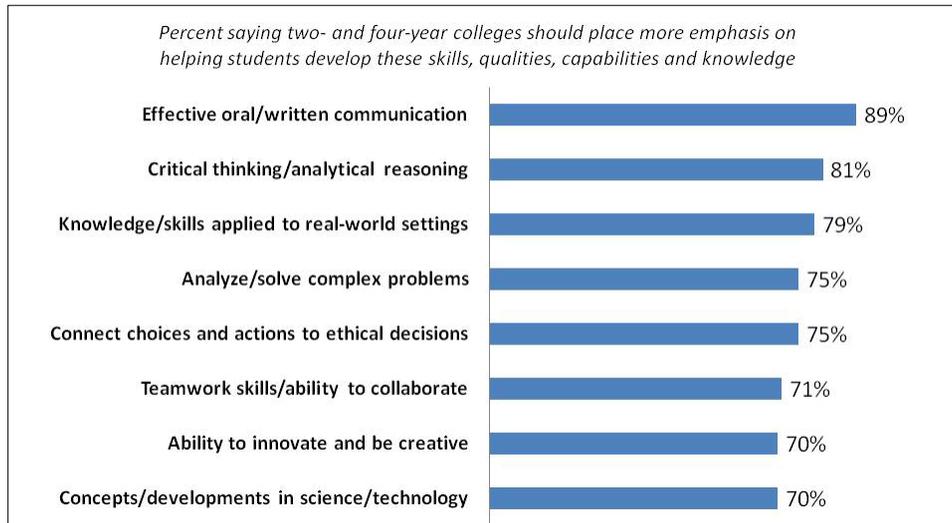
Excellence in academic programs is measured by student learning outcomes, or what students know when they complete a certificate or degree. Employers and educators have expressed their belief that Missouri needs more college-educated workers who have the intellectual skills and practical abilities to succeed in the 21st century economy. There seems to be broad agreement on what those skills and abilities should be:

- Effective oral and written communication
- Critical thinking and analytical reasoning
- Knowledge and skills applied to real-world settings
- Ability to analyze and solve complex problems
- Connecting choices and actions to ethical decisions
- Develop teamwork skills and the ability to collaborate
- Ability to innovate and be creative

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Figure 1: Employers' Top Priorities for Student Learning Outcomes in College

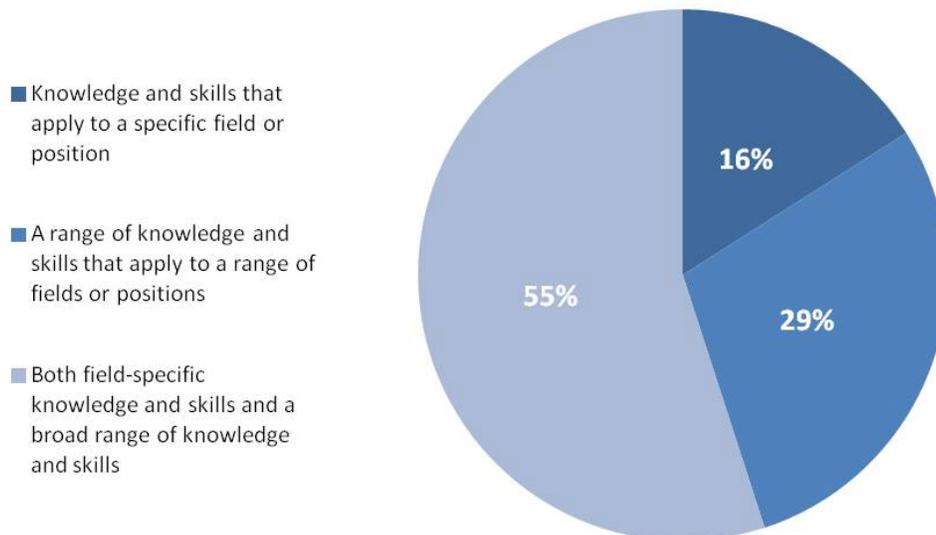


Source: Association of American Colleges and Universities

According to the Missouri Chamber of Commerce and Industry's strategic plan, *Missouri 2030: An Agenda to Lead*, the CEOs of some of the state's largest employers believe that action to improve education and workforce preparedness is absolutely necessary, particularly in the area of "essential" or specific skills. Figures 1 and 2 provide strong support for the importance of producing graduates of Missouri's colleges and universities who are well prepared to demonstrate both broad knowledge and essential skills in the course of their careers.

Figure 2: Employers Want Both Broad Knowledge and Specific Skills

Ranges of knowledge and skills that are more important for recent graduates who want to pursue advancement and long-term career success



Source: Association of American Colleges & Universities

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A recent study by the Association of American College and Universities reported that 95 percent of employers put a priority on “hiring people with the intellectual and interpersonal skills that will help them contribute to innovation in the workplace.” Ninety-three percent agree that “candidates’ demonstrated capacity to think critically, communicate clearly and solve complex problems is more important than their undergraduate major.”

The challenge lies in measuring these skills and abilities in such a way that the assessment is valid and transparent and allows for some level of comparability across disciplines and institutions. Some fields – such as nursing or engineering – have licensure requirements that provide a measure of program quality. Licensure examinations, however, are specific to the field and do not do a good job of measuring the so-called 21st century skills listed above that employers covet.

Academic quality also is closely linked to institutional accountability and mission: What are institutions doing to ensure that students are receiving a high-quality education? As is the case with student learning outcomes, measuring the institution’s performance can be equally challenging.

While a growing number of jobs in Missouri will require a bachelor’s degree or higher, a large number of them can be obtained with a postsecondary certificate or associate degree. Moreover, many postsecondary certificates and associate degrees are “stackable,” meaning a student can be employable with a certificate that can lead to further certification or credentials. For example, a student in an allied health field can earn a certificate and be hired as a certified nurse assistant. While employed, the student could transition to an associate degree to become a registered nurse, and eventually earn a bachelor of science in nursing. Each credential builds on the previous one, assuring a seamless transition and minimizing the loss of credits during the transition.

If Missouri is to achieve its attainment goals, it will have to provide effective career and technical education (CTE) statewide. At present, however, CTE in Missouri is balkanized. Some CTE takes place at the high school level, through 57 Career and Technical Centers, and some is delivered through the state’s community colleges and technical college. The primary source of funding for CTE comes from the federal government, through the Perkins Career and Technical Education Act. The disbursement of Perkins funds to secondary and postsecondary schools is handled by the Department of Elementary and Secondary Education, with approximately 30 percent of the funds going to higher education.

The current CTE system has yet to reach its full potential. A highly-effective and highly-efficient system of career and technical education is crucial to Missouri’s future growth and development.

Progress

Missouri’s colleges and universities are committed to high academic quality and continuous improvement, but the approaches vary across the state. There are numerous initiatives underway, but scaling up is a challenge. During the past three years, MDHE has engaged in several efforts to bring a broader perspective to the assessment of student learning outcomes through the English Pilot Project (EPP) and the Multistate Collaborative to Assess Student Learning Outcomes (MSC).

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The EPP focused on an assessment methodology for a single subject area, in this case, freshman composition, through the development of a rubric, in this case. A group of 15 English faculty members, representing five two-year public institutions, six four-year institutions and four independent institutions developed the rubric. The results of this pilot are encouraging. The methodology has the potential for faculty development, in that it brings instructors from multiple institutions together in a discussion of trends and challenges in student writing and creates statewide conversations about pedagogy and its implications for student learning.

The MSC was launched because many educators believed existing assessment methods (e.g., grades, standardized tests, student surveys, etc.) were inadequate to accurately gauge and consistently share information about important college-level learning outcomes. Key elements of the MSC approach include:

- Assessing learning based on work produced by students for their college courses.
- Enlisting trained faculty members who are not serving as the course instructors to perform assessment.
- Producing measures of average student performance that allow comparisons across institutions, across types of institutions, across states and against benchmarks.
- Focusing on how results can be used to identify and replicate effective teaching methods, curricular requirements and course designs.

The collaboration, which includes 10 Missouri institutions, seeks to produce data that will allow faculty to pinpoint how to improve instruction, make curricular changes, rethink course design, and implement more effective classroom teaching and learning methods. The evidence generated by the project, aggregated across similar institutions, is expected to be useful to states and systems of higher education for cross-institutional and/or cross-state benchmarking and for public reports that will more accurately inform governors, boards, state legislators and other interested in the quality of student learning. After a successful pilot year, the MSC has moved into an implementation phase to scale up across participating states.

Missouri also has adopted a robust performance funding model, which many believe is an effective means for holding institutions accountable for student learning outcomes. At the direction of the governor, a performance funding model was developed and approved by the Coordinating Board for Higher Education in 2012 and codified in state statute in 2014. The 2014 legislation added a sixth measure to the CBHE model, linking institutional performance to job placement and continuing education. This measure is in development and should be in place by academic year 2017.

Strategies to achieve quality and excellence:

- 3.1 *Encourage strong business-education partnerships to increase opportunities for students to engage in more individualized or “hands-on” learning experiences, such as unpaid and paid internships with business and industry, faculty-directed research, young entrepreneurship programs, service-learning and study abroad experiences.*

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- 3.2 *Pursue establishment of a statewide quasi-independent non-profit P-20 council to align public policies and partners, collaborate with regional P-20 partnerships and inform key advocates of a seamless and functional system of education, consistent with the intent of Section 160.800, RSMo.*
- 3.3 *Support appointment of a blue-ribbon third-party panel to review Missouri's postsecondary education system—including governance and regulatory structures, efficiency, missions, adequacy of funding, selectivity policy—to assess how effectively the system is meeting the needs of stakeholders and make recommendations as appropriate.*
- 3.4 Encourage colleges and universities to enable faculty to achieve success in learning outcomes by maintaining the appropriate balance between full-time and contingent faculty and providing all faculty with appropriate professional development, expanded learning support and updated teaching resources, including technical support.
- 3.5 Support collaboration between the Missouri Department of Higher Education and colleges and universities to achieve higher levels of student learning outcomes through better assessment and more extensive use of assessment results. The ground work for this has been laid through Multistate Collaborative to Assess Student Learning Outcomes (MSC) initiative and the English Pilot Project (EPP).
- 3.6 Participate in a comprehensive review of Missouri's current system of career and technical education to affirm strengths and identify areas to improve efficiency and effectiveness. Review participants should include at a minimum the state departments of elementary and secondary education, higher education and economic development; public school districts; community colleges; and the state technical college.

Research and Innovation

Goal 4: Missouri will be a top 10 state for investment in research as a percentage of gross domestic product by 2025

Issues and Challenges

Today's research blazes the trail for tomorrow's economy. But U.S. research intensity – research expenditures as a share of overall gross domestic product – needs major resuscitation to keep up with the intensity of global competitors (Figures 3 and 4), particularly China (American Academy of Arts and Sciences, *Restoring the Foundation: The Vital Role of Research in Preserving the American Dream*; The Information Technology & Innovation Foundation, *Eroding Our Foundation: Sequestration, R&D,*

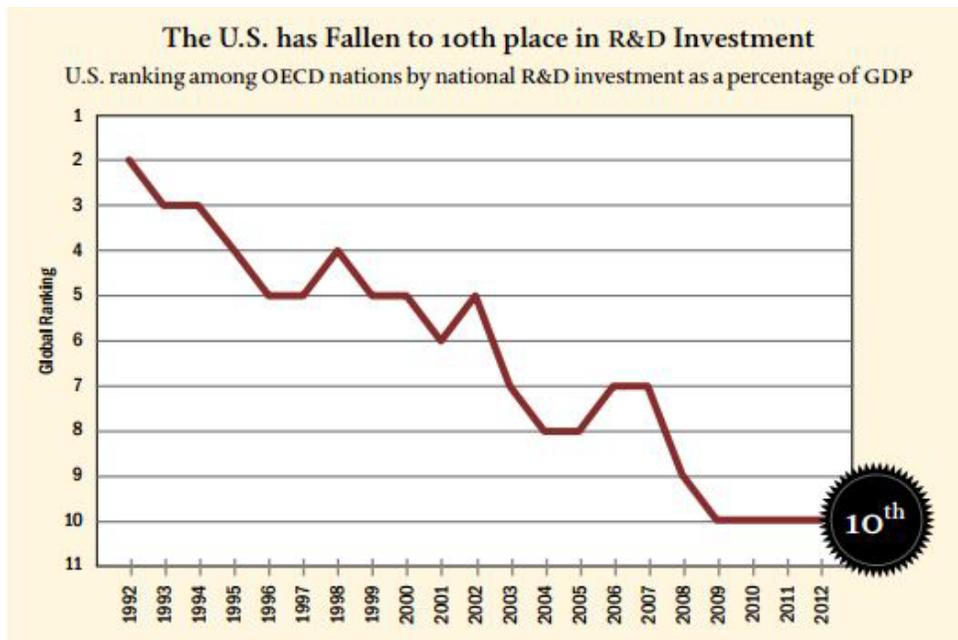
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Innovation and U.S. Economic Growth). Without it, the nation's economy will forfeit the cutting edge in critical fields such as STEM.

In 2012, U.S. academic institutions invested \$65.8 billion in research and development, with such investment concentrating in a relatively small number of research-intensive universities. Continuing a 30-year trend, the federal government provided about 63 percent of total academic R&D funding. Institutions picked up 20 percent, while state and local governments (5.5 percent), nonprofits (6 percent), and businesses (5 percent) accounted for nearly all of the remainder. While the investment snapshot appears substantial, the long-term trajectory shows the U.S. racing toward the middle of the pack in research intensity.

Figure 3: U.S. Ranking in R&D Investment

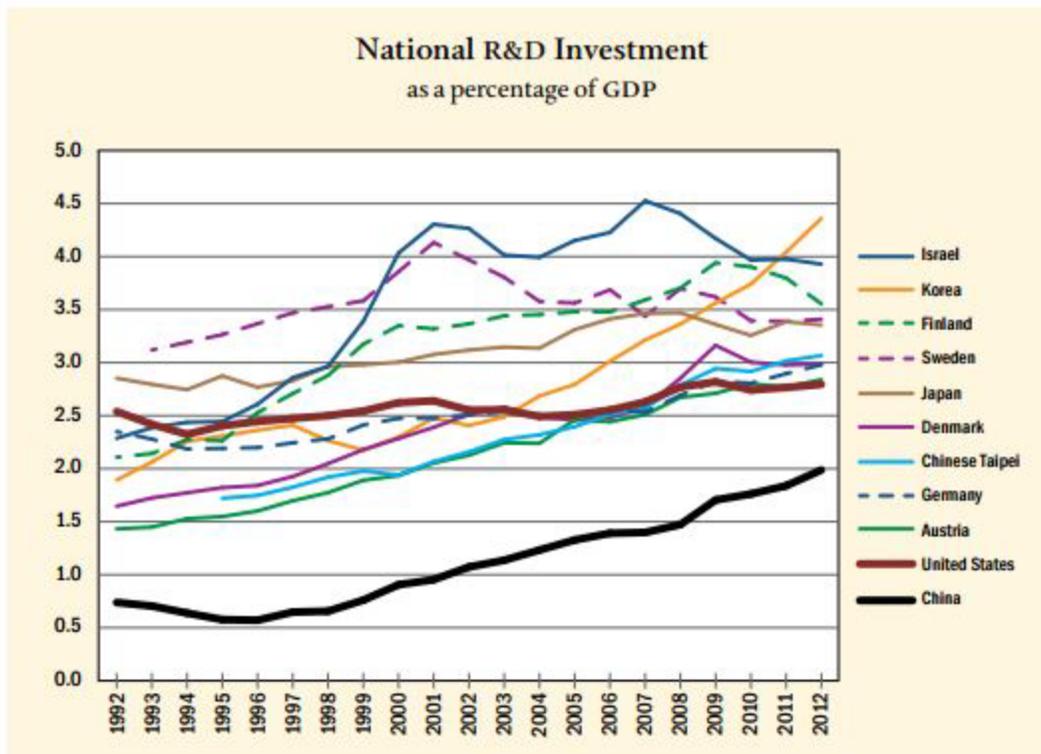


Source: American Academy of Arts & Sciences

Figure 4: National R&D Investment

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Source: American Academy of Arts & Sciences

Disciplinary and institutional silos can slow the pace of innovation. Discovery and invention is increasingly a transdisciplinary and inter-organizational event (American Academy of Arts and Sciences, [Arise 2: Unleashing America's Research & Innovation Enterprise](#)). Diminishing research barriers between departments and institutions, therefore, represents an ongoing imperative to attract funding.

Today, universities are expected to play a larger role in economic development and to build a culture of entrepreneurship for innovations originating in their research laboratories. Traditionally, universities have taken their discoveries to the marketplace through licensing to established companies, with varying degrees of success. However, today's companies are looking for technology to be "de-risked" through startup companies that are able to build prototypes, prove business models and obtain certain levels of regulatory approvals.

Universities can and must play a direct part in this de-risking, even to the point of participating in the startup company development. This new paradigm requires universities to nurture sophisticated management and business acumen within their faculty, students, and communities to develop the business models, raise capital, and take research innovations to market.

With flagging investment and evolving global markets, the U.S. must double down on research to remain competitive. Missouri is in a position to help lead a national resurgence in research intensity.

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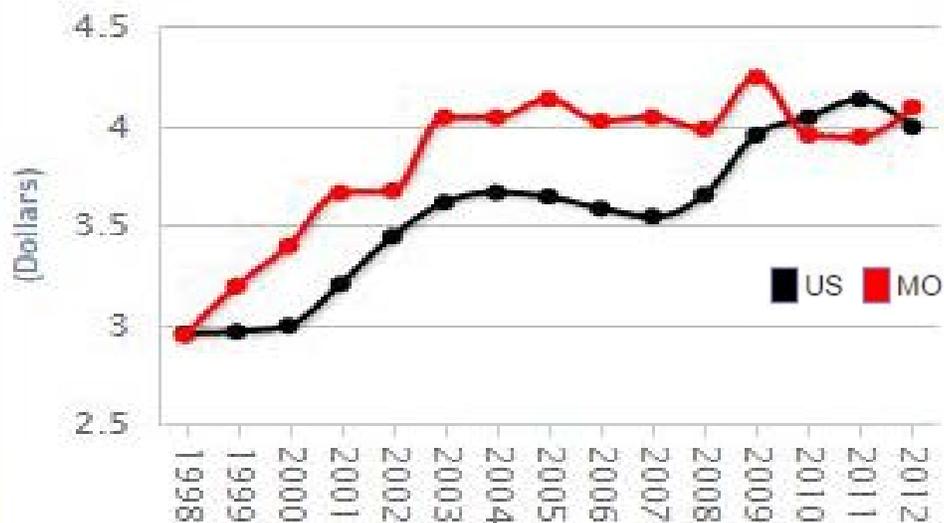
Without a doubt, research pays dividends. During the past 50 years, research and development activities have helped drive the U.S. economy by discovering new technologies and creating new industries, such as pharmaceuticals, aerospace, computing and mobile devices, laser surgery, and countless agricultural breakthroughs (American Academy of Arts and Sciences, [Public Research Universities: Why They Matter](#)). Furthermore, the development of an educated workforce to support these research efforts has a powerful effect on social welfare and the economy through higher incomes and a more engaged citizenry.

Missouri's economy likewise feeds on research and related activities (Figure 5). Numerous studies highlight the economic impact of research activities, including a 2007 study demonstrating that the University of Missouri's basic research added 1/3 of a percentage point to the annual economic growth of Missouri's economy – even when the economy was growing at only 1.5% annually.

Another study, by the Hanover Research Council, found that every dollar spent on research in the state of Missouri generated an additional 94 cents of spending in the state's economy. According to the Hanover paper, every job created in a research park on average generates another 2.5 jobs.

Missouri's Economic Research and Information Center estimates that the \$225 million annual research expenditures from MU directly or indirectly support nearly 10,000 jobs in Missouri. Academic research in science and engineering accounted for about 0.4 percent of Missouri's GDP in 2012, which ranks Missouri 20th among the states for academic research intensity (National Science Foundation, [Science and Engineering Indicators 2014](#))

Figure 5: Academic S&E R&D per \$1,000 State GDP



Source: National Science Foundation

Graduates with sophisticated level skills and research experience spill into the workforce every year. Due in no small part to these graduates, Missouri has built one of the strongest business-sector research

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engines in America's knowledge-intensive economy Missouri ranks 10th nationally for business-led research investment (National Science Foundation, [Science and Engineering Indicators 2014](#)).

For every one dollar of academic research investment, Missouri's business sector spends nearly eight. This exceptional research infrastructure presents a strength, and challenge, to Missouri – to construct a collaborative and synergistic network of information, resources, and intellectual inquiry between the state's business and academic communities. Tighter bonds and economies of scope and scale could help both sectors leverage greater productivity and federal research funding (American Academy of Arts and Sciences, [Arise 2: Unleashing America's Research & Innovation Enterprise](#)).

The task of taking research innovations to market demands sophisticated management and business acumen to develop a business model, raise capital, and complete the transition to the marketplace. Universities have already begun recognizing these elements by hiring or collaborating with skilled innovators and entrepreneurs and transforming the IP licensing and contractual process to be more responsive to today's changing business climate.

Strategies to support increased research and innovation

- 4.1 *Foster an entrepreneurship culture by encouraging the integration of entrepreneurial internships, mentorships, community partnerships, projects, collaborative programs and incubators, and interdisciplinary and inter-institutional engagement into conventional academic pathways.*
- 4.2 *Create a pooled state and private sector matching fund to assist Missouri's colleges and universities in successfully pursuing federally sponsored research grants. A standing matching fund would better enable the state's researchers to "get in the game" when competing with other states for time-sensitive research grants.*
- 4.3 Encourage collaboration between business and university sectors through flexible policies regarding IP ownership, especially IP arising from industry-funded research.
- 4.4 Develop a faculty-led research portal that connects researchers across institutions and departments whose diverse expertise, projects and resources may present opportunities for collaboration and greater access to federal, state, and private-sector research funding.
- 4.5 Coordinate statewide training events to help faculty and researchers navigate the process of technological and idea transfer from university laboratories to the marketplace.
- 4.6 Encourage incentives and recognition for university faculty and researchers who successfully transition laboratory innovations to publicly available products and services.

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Investment, Advocacy and Partnerships

Goal 5: Missouri will promote greater investment in postsecondary education through increased advocacy and powerful partnerships with education, business, government and communities

Issues and Challenges

Nearly all Americans (96 percent) say having a degree or certificate beyond high school is important to an individual's financial security, according to a poll conducted by Gallup and the Lumina Foundation in 2014. About 65 percent say earning more money is a very important reason to get an education beyond high school.

Of Americans who do not have a postsecondary credential, the majority agree that they would feel more secure in their job and their financial future if they did have one. More than 40 percent of Americans without a degree or certificate say they have thought about going back to school to earn one.

The public's belief that higher education is important to their financial security is not misplaced.

As the United States weathered the Great Recession, the impact on higher education on employment became apparent (Figure 6). According to the Georgetown Center on Education and the Workforce:

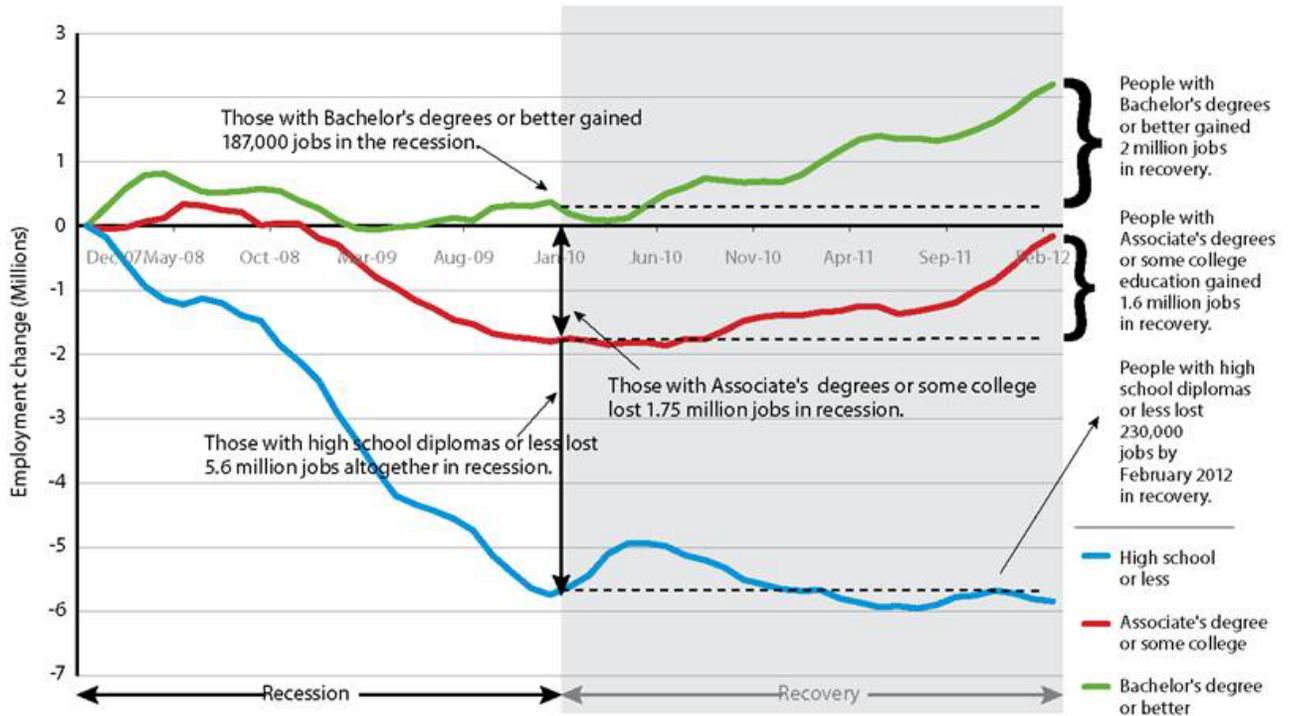
- The number of jobs held by individuals with only a high school diploma or less declined by 5.6 million jobs during the Great Recession. A majority of those jobs are not expected to return. During the economic recovery (2010-2014) those jobs continued to decline by 468,000.
- The number of jobs held by individuals with an associate degree or some college declined by approximately 1.75 million during the recession. Those job losses have been regained and are expected to continue to increase. During the economic recovery, jobs for individuals with an associate degree or some college increased by 2.1 million.
- The number of jobs held by individuals with a bachelor's degree or advanced degree grew by 187,000 during the recession. During the economic recovery jobs requiring a bachelor's degree or higher grew by 2.8 million.

Clearly, for many, the path to success runs through postsecondary education.

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Figure 6: Employment and Education, Recession and Recovery



Source: Georgetown Center on Education and the Workforce

While the public's belief in the promise of higher education is well documented, they also have strong misgivings about their ability to pay for it. Many are losing confidence in the ability of American colleges and universities to control cost and price. Reconciling these views is imperative.

Communicating more clearly to Missourians about the benefits of earning a degree or certificate is key to increasing higher education investment in the state. While most believe in the importance of higher education, the full extent of its value can remain obscured by sheer complexity and competing public priorities. A fresh presentation of the facts can solidify and augment Missouri's existing cultural bent toward higher learning. Continued visibility in the finite space for public investment and attention depends on continual public engagement. Many governmental endeavors are rightly important to Missourians; higher education will not maintain its seat at the table through polite silence, but through active dialogue about value.

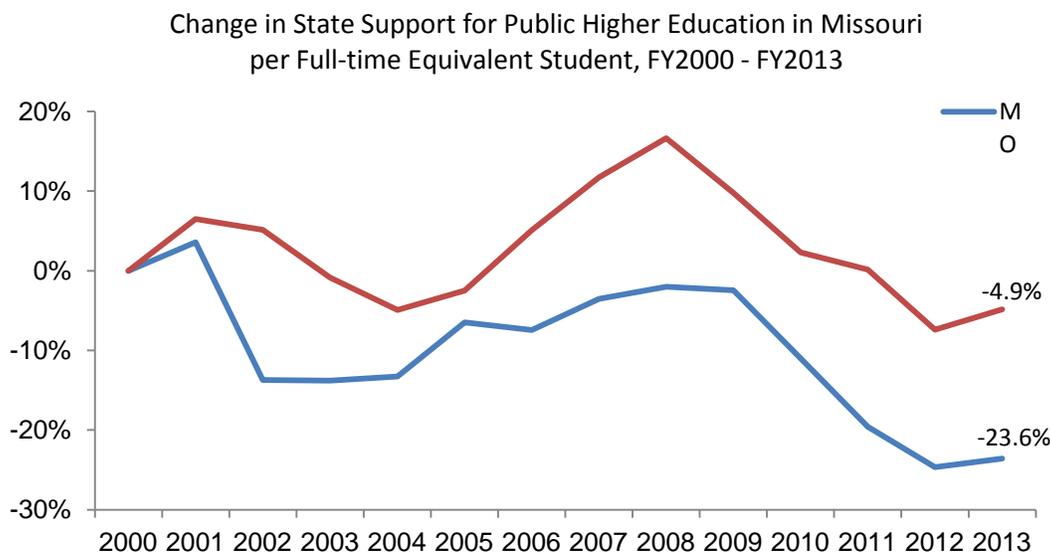
Higher education must engage with more urgency, state policymakers and the constituents they're elected to serve—those with long family traditions of higher education and those without, young people, retirees, veterans, the under- and unemployed, community organizations, businesses searching for skilled workers, and many others. The best case for investment in higher education is one that emanates circumspectly from all of Missouri's diverse perspectives and voices.

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For more than a decade, Missouri's investment in higher education declined (Figure 7). From 2000 to 2013, state support for higher education per full-time-equivalent student decreased 23.6 percent. Nationwide, the decline was 4.9 percent during the same period.

Figure 7: State Support for Higher Education



Source: SHEO State Higher Education Funding Report

In recent years, state funding for higher education has taken a positive turn. Performance funding for public colleges and universities, funding for capital improvement projects and increases for several of the state's student financial aid programs have injected some much-needed revenue into Missouri's higher education system.

Increased support for higher education will be necessary for more Missourians to earn a degree or certificate. Colleges and universities are poised to make dramatic progress in expanding and developing partnerships on a statewide scale to increase awareness of the importance of education beyond high school and improve support for higher education in Missouri.

Progress

The time is past when the education and business sectors in Missouri can afford to go it alone. Rational public policies affecting the economic vitality of the state require unprecedented collaboration if they are to achieve their mutual goals.

There have been partnerships between higher education, public education and Missouri's business community in the past. The landscape of Missouri's economy is dotted with examples of thriving relationships between specific businesses and public and private colleges and universities. Examples include the innovation partnerships in Lee's Summit, the Northlands area of Kansas City, and most

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recently in Springfield, as well as the vast regional partnership in St. Louis that is identifying and addressing projected future workforce needs there. The persistent challenge is to develop ways to scale up these efforts to meet the growing demand for highly skilled employees.

When this strategic planning process was launched in December 2014, the Coordinating Board for Higher Education expressed its clear commitment to developing a closer long-term relationship between higher education and Missouri business and industry. The membership of the coordinated plan advisory committee includes several representatives from state and local chambers of commerce, economic development organizations and private business and service industries. Numerous witnesses from the business and economic development sectors gave testimony during nine regional public hearings. The contributions of these advisors are evident in the goals and strategies that comprise this report.

The Missouri Department of Higher Education recently accepted an invitation from the Missouri Chamber of Commerce to participate in the chamber's Workforce Alliance, which includes representatives from business, public education and higher education. The Alliance is identifying concrete action steps that can be taken to close the perceived gap between the skills graduates have mastered and those skills that business partners say are needed to succeed in the fast-paced, ever-changing business environment. The Chamber's initiative will sharpen the case for the value of higher education investment.

An emerging theme from the public hearings centered on the need to give college students more opportunities for hand-on experience so that they might gain better insights into the nature of work in their chosen professions. Another theme stressed the need for education and business partners to launch aggressive advocacy efforts to support these initiatives.

Strategies for building a stronger culture of education and training through investments, advocacy and powerful partnerships:

5.1 *Develop powerful partnerships with education, business, government and communities to strengthen the case for a strong system of higher education in Missouri. Tactics:*

- *Form a Missouri Business and Education Coalition to advance a public agenda focused on education, skill training and jobs.*
- *Develop a broad-based communication strategy to promote a culture of educational attainment among our young people and their families and foster a sense of urgency about the need to make the hard investment decisions that will lead to quality educational opportunities for all. Seek private -sector support for the initiative.*

5.2 *Incent the private sector to provide broad support for initiatives that offer practical experience, mentoring programs and career advising. Tactics:*

- *Fund innovation grants to support programs geared to meet the state's educational attainment and skills training needs.*

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- Expand and enhance partnerships between postsecondary institutions and business and industry for delivering customized employer training and onsite workforce training.
- Engage employers to be mentors in the classroom and increase the number of students exposed to the workplace through paid internships, job shadowing, work study and other means. Develop pathways programs, such as the Missouri Innovation Campus or Pathways to Prosperity.



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