

COLORADO BUSINESS REVIEW

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State Budget Crunch is Trouble for Higher Education

Todd Saliman

In the near future, Colorado will probably be facing budget shortfalls each year as revenues will not cover the cost of existing state-funded programs. This will lead to difficult choices for policy makers that will likely result in a continuing decline in state funding for higher education.

As someone who managed the state's budget through the Great Recession by recommending billions of dollars in necessary budget-balancing actions

and cuts, I have a particular insight into what lies ahead. And in my role as chief financial officer for the University of Colorado, I believe higher education is squarely in the cross hairs.

The consequences are not good for Colorado. Our colleges and universities not only educate the highly skilled workforce our state needs to be healthy and competitive; they also are one of the state's top economic drivers and a key to our quality of life.

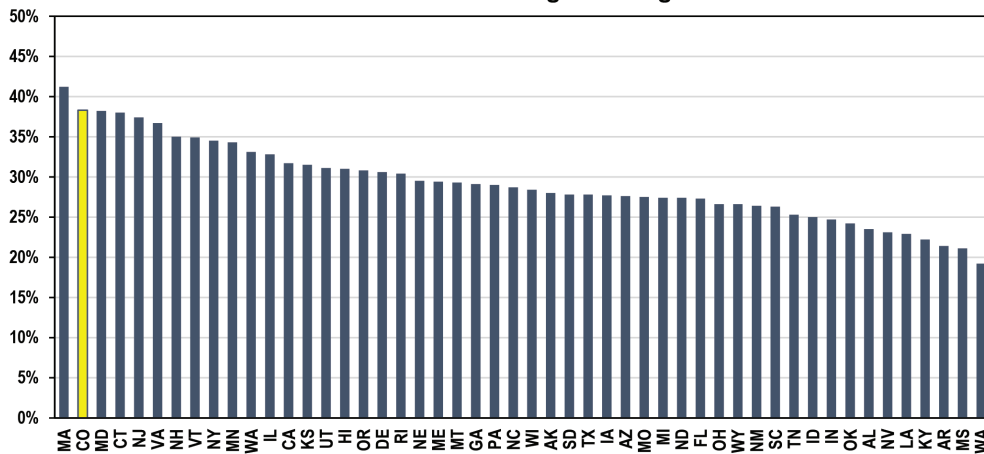
With help from a team of experts (including the CU Boulder Leeds School of Business), the Budget and Finance area of the CU President's Office prepares a quarterly state revenue and expenditure forecast that looks 10 years into the state's fiscal future.

While longer-term forecasts are reliably unreliable, they can illuminate general trends. Our forecast shows that over time, state constitutional and federal requirements will result in mandatory spending growth in both K-12 education and healthcare.

Because the forecast also shows that state revenues will not keep up with this required spending growth, other parts of the state budget will be forced to either grow slower or face cuts. Higher education is the largest discretionary portion of the state budget pie and will almost certainly bear the brunt of this shift over time.

This is particularly challenging since Colorado already ranks 48th nationally

Percent Bachelor's Degree or Higher



Source: U.S. Census Bureau, American Community Survey 2014.

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FROM THE EDITOR

This issue of the *Colorado Business Review* examines the education industry in the state of Colorado, including public and private pre-K–12 and higher education, and specialty schools that teach drivers' training, dance, and many other skills.

The comprehensive education system is not only one of the largest industries in the state, employing thousands of teachers in the public and private K–12 and higher education systems, but it is also a critical component of the future of our state's diverse economy and quality of life. Our highly educated workforce has endowed Colorado with a competitive advantage that is helping grow our economy. This issue of the *CBR* provides an overview of the size of our education system in Colorado, and looks at some of the successes and challenges facing education today.

FIFTY-SECOND ANNUAL COLORADO FORECAST

2017 Colorado Business Economic Outlook Forum

SAVE THE DATE

Mark your calendar to attend the 2017 Colorado Business Economic Outlook Forum on December 5 at the Grand Hyatt Denver. Check www.colorado.edu/business/brd for event updates.

We are interested in your suggestions for topics of upcoming issues. Please contact me directly at 303-492-1147.

—Richard Wobbekind

in state funding for its resident college and university students.

We use our 10-year forecast as a guidepost as we develop CU's budget and tuition plans and to inform stakeholders about future state budget risks. Each year CU creates five-year budget scenarios for our four campuses that show the possible result of forecasted state funding levels.

The forecast has painted a remarkably consistent picture over time for the state and CU. It predicts that annual budget shortfalls are in the state's immediate future. Unfortunately, this is not something new. In fact, Colorado has had to balance a shortfall almost annually for quite some time. It happened during the current fiscal year, and it will happen again during FY2017–18.

State budget writers have always been careful to minimize impact to state services as much as possible while balancing the budget, so these shortfalls have been addressed slowly. That means the effects are gradual, sometimes barely noticeable from year to year. Yet over time, the cumulative effect is dramatic.

Since the year 2000, state funding per resident student at CU has declined 50% when adjusted for inflation. CU isn't alone in this regard. Statewide, the average decline in state funding per resident student at all public institutions of higher education has been 33%.

CU and other higher education institutions have responded to this decline by finding efficiencies, instituting better business practices, developing new funding streams and, yes, by increasing tuition while also working to maintain access and affordability.

Still, the importance of public funding for public universities and colleges cannot be overstated. Public funding keeps higher education affordable and accessible, and ensures quality.

We project that the state's budget challenges will continue to expand because revenues simply will not cover the spending needed to maintain current levels of service.

That doesn't mean the state budget will shrink. It will grow. But when population growth and conservative budget growth assumptions are factored in, a budget shortfall appears in every fiscal year.

Colorado has unique challenges when it comes to our state's finances. We are the only state in the nation with a constitutional amendment that limits state revenues.

Even if this limit were not in place, our forecast still shows budget shortfalls. However, the limit makes anticipated budget shortfalls even larger because the state is required to refund dollars that would have almost certainly gone to transportation infrastructure, and K–12 and higher education.

During the last legislative session a concept was discussed called the Hospital Provider Fee that would have enabled the state to not refund these dollars. The bill would have changed how fees paid by hospitals to the state are reflected in the state's revenue calculations. The bill did not pass.

If this effort is attempted again in 2017, and if it succeeds, projected budget shortfalls would be smaller and the budget shortfall for higher education would almost certainly be reduced. That's not to say the state budget shortfall would be totally eliminated. It would still occur, but it would be significantly smaller.

If the Legislature does not change the law, state budget writers will do their job and balance the budget by making cuts. My experience tells me how hard that is, and I have every reason to believe higher education will be among those atop the list of cuts.

As history has proven, higher education in Colorado will respond to this with innovation and resolve to provide an excellent product to all of our customers. Coloradans should take comfort in this commitment, but they should also be alarmed at the long-term damage to a critical area of our state that advances our economy, health, lifestyle, and culture. Sustained cuts come with a price over time. And our 10-year forecast is all about helping us determine what that price may be. ☹

Todd Saliman is the Vice President of Budget and Finance and Chief Financial Officer of the University of Colorado.

The Business of Education in Colorado

Jackson Rueter and William Maguire

Colorado boasts the second-highest percentage of bachelor's degrees in the country, and is 14th among states for the number of individuals with a high school degree or higher. The state's educated population is often attributed to business growth, retention, and relocation. Education itself is big business in Colorado, recording 239,900 public and private education employees working in K-12 and higher education, as well as in specialty schools and camps (e.g., driver education, cosmetology, swimming, basketball, etc.). Combined, all areas of public and private education accounted for 9.4% of total employment in Colorado in 2015. Among the largest components of education, the public K-12 system was responsible for educating just under 900,000 students during the 2015-16 school year, and the public higher education system recorded enrollment topping 250,000.

Employment and Wages

In 2015, Colorado recorded 38,200 private educational services employees, 68,400 state government education employees (higher education), and 133,300 local government education employees (K-12). While employment in private and public education accounted for 9.4% of total employment in Colorado compared to 9.7% nationally.

Employment in the education sector has continued to grow in the state for the past four years, with the fastest pace of growth recorded in private education.

According to the Bureau of Labor Statistics, annual pay in 2015 averaged \$58,275 for state government educational services, \$39,292 for local government educational services, and \$38,887 for private educational services. The annual pay was \$54,176 for all industries in Colorado. The average salary for Colorado's 51,802 full-time equivalent (FTE) teachers in 2015-16 was \$51,204 according to the Colorado Department of Education (CDE).

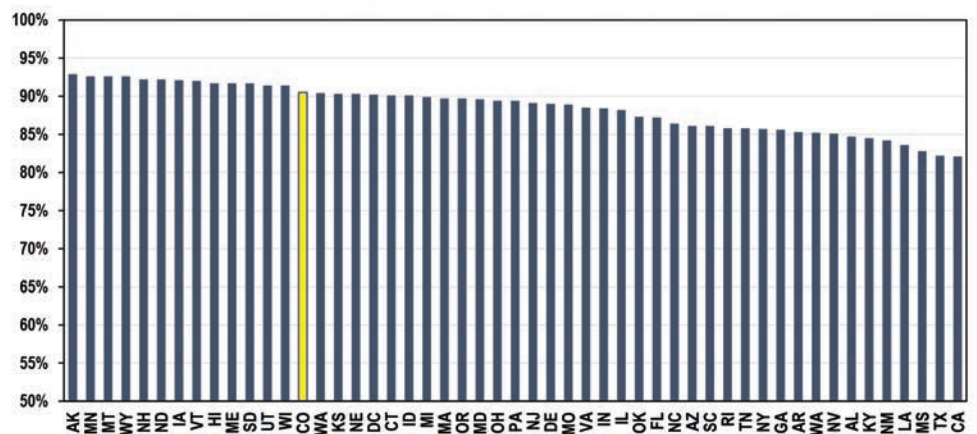
K-12 Public Education

According to CDE, public schools in the state, including charter schools, total 1,853. Elementary schools make up approximately half of those schools, at 942, middle schools account for 259, and high schools total 305. The remaining 347 schools are made up of combined elementary/middle schools (153), elementary/middle/high schools (86), and middle/high schools (108).

The 2015 data from CDE indicate the total number of pupils has grown to 899,112. Denver County 1 was the largest school district in the state in 2015, with 90,234 students. Only

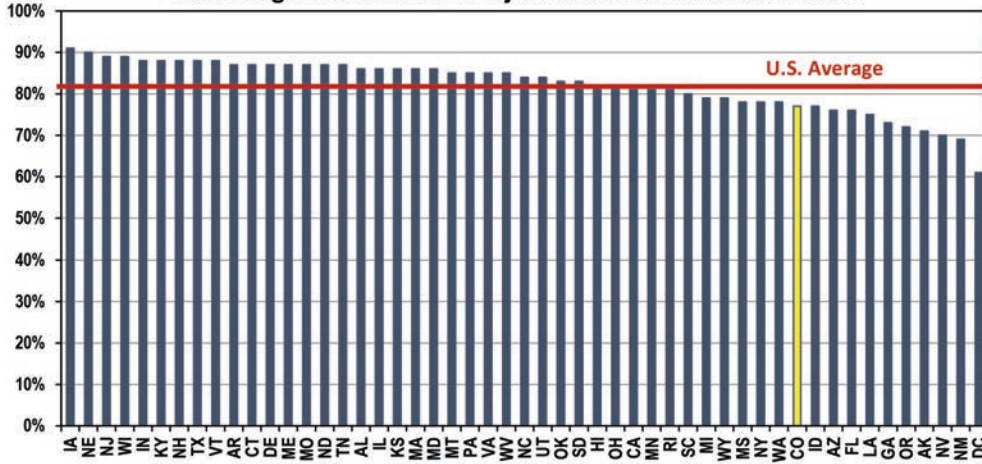
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Percent High School Graduate or Higher



Source: U.S. Census Bureau, American Community Survey 2014.

Public High School 4-Year Adjusted Cohort Graduation Rate



Source: U.S. Department of Education, National Center for Education Statistics.

51% of districts recorded growth over the past five years. The number of elementary school students (pre-K–grade 5) in Colorado schools increased from 436,574 students in the 2014–15 school year to 437,660 students in the 2015–16 school year, a 0.3% increase. The number of middle school students (grades 6–8) in Colorado increased 1.4%, from 197,789 to 200,543, over the same period. The number of high school students (grades 9–12) experienced the largest growth, 2.5%, rising from 254,643 to 260,909 from 2014–15 to 2015–16. The statewide pupil/teacher ratio during the 2015–16 school year was 17.5.

The total on-time (four-year) high school graduation rate for the class of 2015 was 77.3%, the same as for the class of 2014.

Funding

According to CDE, Colorado's 178 school districts are funded through the Public School Finance Act of 1994. Most revenues are from state taxes, local specific ownership taxes (vehicle registration), and local property taxes. The base amount of funding allotted by the state to each pupil in 2015–16 was \$6,292. Funding per pupil may change depending on the cost of living

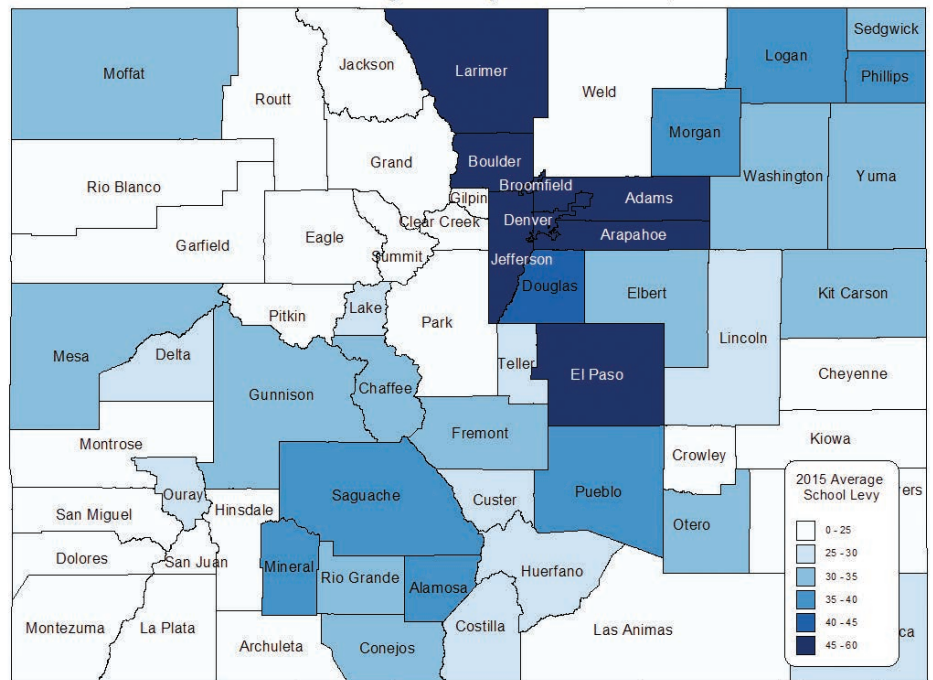
factor, personnel costs factor, size factor, at-risk funding, on-line funding, and the negative factor. (According to the Colorado Legislative Council, the negative factor is a provisional state law that “reduces each district’s total program funding by a specified percentage determined by a targeted funding level chosen by the General Assembly.”)

The total funding from state and local taxes in the 2015–16 for all school districts in Colorado after the negative factor was \$6.2 billion. The state’s share of that was nearly \$4.1 billion, and the local property tax share was \$2 billion (about one-third of the total), plus \$150 million in local specific ownership taxes.

Scores

Test scores in Colorado have been stagnant the last five years based on TCAP/CSAP (Traditional Colorado Assessment Program/Colorado Student Assessment Program) data provided by CDE from 2010–2014. The number of students who score proficient in a given subject has remained relatively steady. Reading scores have consistently had the greatest proportion of students who show proficiency on TCAP/CSAP. The distribution of students who score either partially proficient or proficient on the writing portion of the assessment is approximately equal. Math TCAP/CSAP scores have a much higher proportion of students who score “advanced” on tests than writing and reading. Interestingly,

Colorado Average County School Levies, 2015



Source: Colorado Department of Local Affairs, Division of Property Taxation.

the percentage of students who score proficient or above on math and reading is the same, indicating that there is not necessarily a higher overall proficiency in math compared to other subjects.

In addition to TCAP/CSAP, Colorado also requires all high school students in 11th grade to take the ACT test; it is one of 17 states with this requirement. According to CDE, the composite score on the ACT has risen slightly, from 20.0 in 2010 to 20.1 in 2015. Scores on the science portion have increased over the last five years, from 20.1 in 2010 to 20.5 in 2015. It is difficult to discern whether scores on the other sections of the test have changed over the last five years.

Higher Education Enrollment, Degrees, and Graduation

The Colorado Department of Higher Education (CDHE) reported 30,015 (55.8%) of the 53,771 students who graduated high school in 2014 enrolled in a postsecondary institution—an increase from 2013 to 2014. In 2014, 42.5% of high school graduates enrolled in in-state colleges while 13.3% enrolled in out-of-state schools. In the state of Colorado, there are 31 public higher education institutions, 103 private and seminary institutions, and 354 private occupational schools. Of those that are public, 14 are four-year universities and 17 are two-year community colleges or trade schools. A majority of the 251,778 students attending public higher education institutions are enrolled in four-year universities (62.3%), and 53% are women. Most students are undergraduates (89%) and state residents (85%). A higher proportion of students at private universities are graduate students (28%) than at public institutions (11%).

Using the most recent statistics (fall 2014) from CDHE, 251,778 people were enrolled in public institutions, down from fall 2013, with 254,981 enrolled. Enrollment in four-year public institutions

increased from 2013 to 2014, from 155,633 to 156,934. Enrollment in community colleges fell from 2013 to 2014, from 88,505 to 84,138. A total of 55,165 degrees were awarded in the 2013–14 academic year: 11,735 certificates, 8,651 associate degrees, 25,731 bachelor's degrees, and 9,048 graduate degrees.

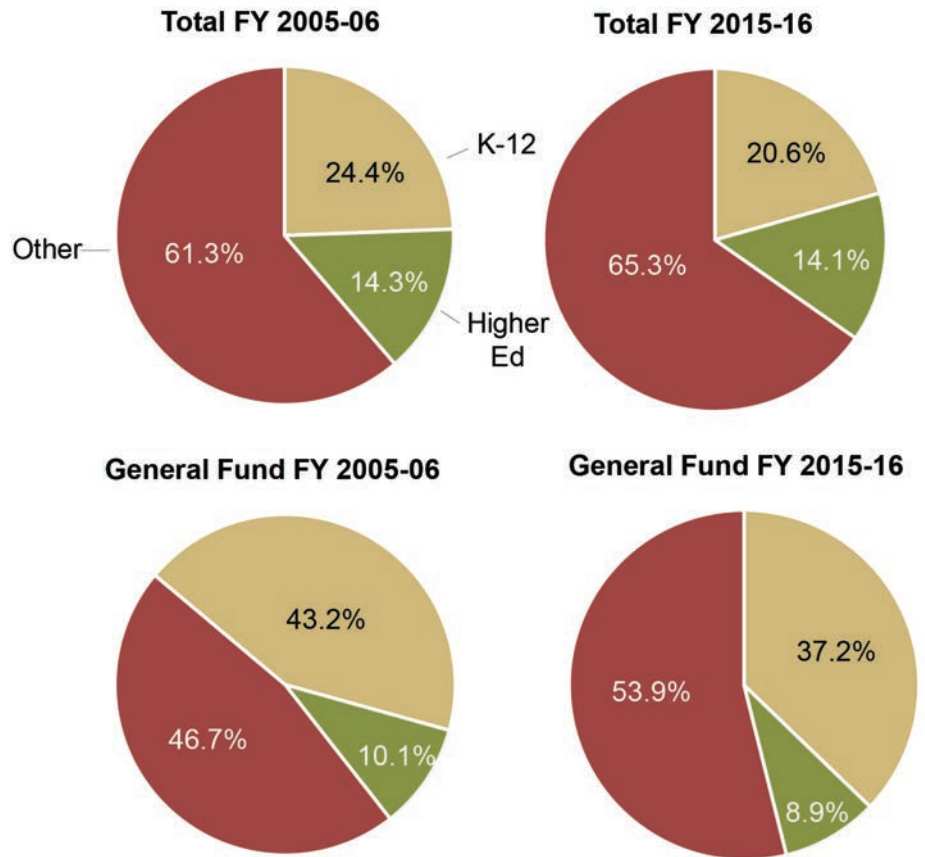
As of September 2015, more than 5,800 certificate, associate degree, bachelor's degree, master's degree, and doctorate programs were offered in the state of Colorado. Certificates (33.2%) and bachelor's degrees (25.5%) account for a majority of the programs offered, while doctoral programs are the least common programs, at 6.8%. Undergraduate programs have a greater

concentration of students than master's and doctoral programs.

Student Funding

Since 2000 a shift has occurred in who pays for a majority of college expenses. In FY2000–01, the state funded 68% of the cost of college while students paid 32%. The most recent data from CDHE's *Tuition and Fees Report Fiscal Year 2015–16* show that students now pay 64% while the state pays 36%—an almost perfect reversal. According to the college and university data from CDHE, total expenditures on student financial aid have decreased over the last three years, from \$2.3 billion in 2011–12 to \$2.2 billion in 2013–14. A majority of student funding

Colorado Budget Appropriations by Program



Source: Colorado Joint Budget Committee, Appropriations Report FY 2015-16.

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The Path to Becoming a Licensed Teacher

Elizabeth J. Meyer

The teaching profession is a rewarding career attracting individuals who have a passion for working with youth and an interest in making a difference in their communities. At the University of Colorado Boulder's School of Education, teacher candidates work toward earning initial teacher licensure while concurrently completing an undergraduate or graduate degree, or, for those candidates who already have completed a bachelor's degree, pursue only the initial teacher licensure. CU Boulder offers teacher licensure programs in K–12 Music Education, K–6 Elementary Education, and 7–12 Secondary English, Math, Science, Social Studies, or a World Language.

Through university-based teacher licensure programs, teacher candidates learn about innovative teaching practices, learning theories, child and adolescent development, student diversity and identity, and assessment practices. In addition to working with faculty in university coursework, teacher candidates are required to earn 800 hours of practicum experience working with youth in classrooms. These experiences expose future teachers to a wide range of students, pedagogical approaches, and school communities to ensure they know what to expect in their career as a teacher.

Traditional university-based teacher licensure programs prepare teachers who have the knowledge, skills, and

dispositions to foster learning for all students in diverse classrooms. Our program, along with many other traditional licensure programs, is committed to introducing future teachers to evidence-based research and practices that allow them to become reflective practitioners, critical thinkers, and future leaders in the field of education. Through coursework and field experiences that gradually increase their responsibilities and time in classrooms, teacher candidates gain knowledge and confidence in supportive environments so they can be innovators who contribute to the continuous improvement of teaching practices. At CU Boulder, we are also committed to bringing issues of democracy, diversity, and social justice to the foreground in discussions about who learners are, what they need, what should be taught, and how the social, political, cultural, and historical contexts of schooling shape what happens in classrooms. We believe these elements are essential to reducing opportunity gaps—sometimes referred to as achievement gaps—that exist in American education.

The teacher licensure programs at CU Boulder are performance-based and anchored in both state standards and our specific program goals. Each program has been carefully designed to prepare K–12 teachers who meet the Colorado Teacher Quality Standards outlined by the Colorado

Department of Education. Additionally, the School of Education recommends an initial teaching license when teacher candidates have satisfied each of the six following Colorado Teacher Quality Standards adopted by the State Board of Education:

- Teachers demonstrate mastery of and pedagogical expertise in the content they teach.
- Teachers establish a safe, inclusive and respectful learning environment for a diverse population of students.
- Teachers plan and deliver effective instruction and create an environment that facilitates learning for their students.
- Teachers reflect on their practice.
- Teachers demonstrate leadership.
- Teachers take responsibility for student academic growth.

Teacher candidates must either demonstrate understanding or the ability to perform independently at the level expected of a first-year teacher, and their courses and practicum experiences provide the foundation for each standard and opportunities to develop and practice associated skills.

All teacher preparation programs in Colorado must meet the standards set by the Colorado Department of Education and the Colorado Commission for Higher Education. Many programs, such as CU Boulder's, are also accredited by the National Council for



Photo courtesy of Glenn Asakawa

Accreditation of Teacher Education (newly renamed the Council for the Accreditation of Educator Preparation), which evaluates teacher preparation programs based on national professional standards and ensures that students in these programs meet more rigorous expectations for beginning teachers upon graduation. Nationally accredited programs often offer greater portability to teachers who are interested in working in other states or internationally.


The profession depends on sustaining high standards for educator preparation and the state depends on qualified teachers. However, there is a well-publicized teacher shortage across the nation and in Colorado. Due to high teacher turnover and lower numbers of new teachers completing licensure programs, many school districts are being forced to hire teachers with emergency credentials (a short-term license issued to hire someone who has not completed a credential program in order to fill a hard-to-staff opening) or through alternative licensure pathways.

The U.S. Department of Education has maintained the “teacher shortage areas” list by state and by subject area since 1990–91. Then, the state saw a need for special education teachers. Today, the special education shortage continues and the list of subject areas has expanded to include art/music/drama, world languages, math, science, and speech and language. A Colorado

Department of Higher Education (CDHE) legislative report published in February 2016 found that Colorado is looking at a shortfall of approximately 300 teachers annually, with shortages more prevalent in rural areas. Some experts estimate shortcomings at even higher rates, and research shows the shortage is not only about recruiting new teachers, but retaining educators as well.

These trends and the new Every Student Succeeds Act have cleared the way for the rapid growth of alternative pathways to licensure, like Teach for America and other “fast-track” programs. In Colorado, individuals seeking an alternative licensure program increased 42% in 2014–15 from 2013–14 according to the CDHE report. This is in spite of research indicating that schools of education produce more qualified and effective teachers than many alternative licensure programs. Alternative licensure pathways tend to put underprepared teachers in their own classrooms right away and then offer coaching and courses while they teach. Alternative program teachers are overrepresented in districts that have higher levels of “high needs” students (e.g., students in poverty, emerging bilinguals, students with special needs) where the lack of experienced teachers furthers gaps in educational opportunities and outcomes.

As we aim to prepare and support teachers, rather than looking to alternative programs, we should recruit,

reward, and retain teachers in historically hard-to-staff licensure, advanced endorsement, and regional areas and advance teacher professionalism. In Colorado, we need to advocate for more institutional support for students who are interested in pursuing teacher licensure and remove barriers (financial and otherwise) that keep qualified individuals from pursuing well-supported, rigorous paths to becoming teachers. At CU Boulder, we aim to do just that. 

Elizabeth J. Meyer, PhD, is Associate Dean for Teacher Education at the University of Colorado Boulder’s School of Education. She may be contacted at elizabeth.j.meyer@colorado.edu and on Twitter: @lizjmeyer.

English Learners, Immigration, and Success in the United States

Karla Esser and Loretta Chávez

Colorado, and indeed our nation, has relied on the contributions of immigrants since William Bradford and the Pilgrims first landed in what became the Plymouth Colony in 1620. America has historically benefited from immigration for settlement and prosperity. As stated by President James Madison, “America was indebted to immigration for her settlement and prosperity. That part of America which had encouraged them most had advanced most rapidly in population, agriculture and the arts.”

Bilingual Students in Colorado

In the past 10 years, the number of bilingual students in Colorado has grown 45% compared to only 15% growth in total student population. As of October 2015, a total of 128,041 English learners (ELs) were registered in Colorado’s K–12 schools, which is 15% of the total student population. Of these, 83% are Hispanic or Latino; 84% of all bilingual students speak Spanish. However, a staggering 208 different languages are spoken at home by our English learners; Vietnamese is the second most frequently spoken language, at only 2%. A total of 71% of these students live in the Denver Metro area and 75% qualify for the free and reduced price lunch program (Colorado Department of Education 2015).

Adams 14 School District in Commerce City has the highest percentage of bilingual students, at 44%, and Westminster is second, with 41%. Denver Public Schools has the largest number

of bilingual students, 31,000, and Aurora Public Schools follows, with 16,000 (Colorado Department of Education).

TOP 10 LANGUAGES SPOKEN BY COLORADO ELS, 2015

Rank	Languages	Number of ELs	Percentage
1	Spanish	99,853	84.1%
2	Vietnamese	2,248	1.9
3	Arabic	1,564	1.3
4	Russian	1,564	1.3
5	Chinese, Mandarin	1,086	0.9
6	Korean	868	0.7
7	Nepali	857	0.7
8	Amharic	793	0.7
9	Somali	788	0.7
10	Hmong	552	0.5

Source: Colorado Department of Education.

Although bilingual students fall below the average high school graduation rate, districts have been successful in continuously addressing this gap. In 2010, the graduation rate for ELs was 54%; however, in 2015 that rate improved to a state average of 62%.

K–12 Educational Programs for English Learners

Programs for bilingual students are as varied as the 177 different school districts in the state that serve them. Each district has local control to decide which English language program is best suited to their bilingual population. Districts are bound by the Castaneda three-part assessment (Castaneda v. Pickard 1978, U.S. District Court for Southern District of Texas) that requires programs be based on sound educational theory and have enough resources to implement effectively. They must also prove after a trial period that

the program is effective in overcoming language barriers. As of 2015, the following programs were in place in Colorado:

- Dual language, learning Spanish and English simultaneously
- Late exit bilingual, with students not moving to all-English classes until they are prepared
- Early exit, with students spending an average of three years in a bilingual program before moving to all English instruction
- English language development classes, both push-in and pull-out (qualified English Language teachers either pull ELs out of their regular classroom for English instruction or support these students in the classroom)

The Path Less Taken

It is important to note that ELs are not a homogeneous group and have broad demographic variations. Only 35% of ELs are foreign born and/or recently arrived immigrants; most were born in the United States, which is contrary to what is often assumed (Education Week 2009). Most ELs are U.S. citizens or legal permanent residents; a small percentage are undocumented (Garcia, Kleifgen, and Falchi 2008). Some students develop their English language proficiency quickly and then exit their English as a second language (ESL) program, while others remain in the ESL program for long periods of time, some throughout their

U.S. schooling experience (Umansky and Reardon 2014).

Nationally, only 18% of ELs attend a four-year college, while 38% of English-proficient linguistic minority (LM) students (students who speak a language other than English at home but who are English proficient) enroll in a four-year college. These statistics compare to 43% of their monolingual English-speaking peers who attend a four-year college (Kanno and Cromley 2015). ELs are also more likely to enroll in a two-year community college versus a four-year college or university. Academic preparation, or lack thereof, could possibly be a factor in why more ELs attend a two-year institution versus a four-year institution (Kanno and Cromley 2015).

Regarding graduation, only 12% of ELs attain a bachelor's degree while 25% of LM students and 32% of monolingual English-speaking students graduate from four-year institutions. Factors that could contribute to low enrollment and low graduation rates for ELs are poor academic achievement in high school and low socioeconomic status, with many ELs lacking the monetary resources to go to college (Kanno and Cromley 2015).

Why Immigrants Matter

According to Vasan (2015), immigrants are vital to the economy of our state. In 2013, Colorado's immigrant population increased to 9.5%. These community members are both employees in sectors seeking workers, such as construction and tourism, as well as entrepreneurs


starting new businesses that provide jobs. More immigrants work in blue-collar jobs than Colorado-born residents; however, the majority of immigrants are employed in white-collar positions, such as education, healthcare, or social services.

With an unemployment rate in the 3% range, Colorado depends on the critical contribution that immigrant workers make. The Center for American Progress estimates that in 2010 immigrants paid \$3.5 billion in taxes, adding another \$21.6 billion to Colorado's gross state product. Goods and services generated by working immigrants totaled \$43.8 billion (Vasan 2015).

Immigrant Workers and their Children

What is clear from these statistics is how much the Colorado economy depends on immigrant employees and entrepreneurs for a healthy economy. New workers to the state come with their families and often have children while in the state. Immigrants and the education of their children are a vital part of our state's economy and prosperity, as well as that of our nation. Some of our nation's most influential citizens were immigrants, including two secretaries of state, Kissinger and Albright; a world-renowned physicist, Albert Einstein; a writer and publisher, Joseph Pulitzer; and a famous architect, I.M. Pei. Several were unable to speak English upon their arrival.

The United States has developed, grown, and improved through

immigration from its very beginning through today. It is in our best interest to welcome and educate new bilingual students so that they, too, can contribute to our state and our nation. 

Dr. Karla Esser, Regis University, and Dr. Lorretta Chávez, Metro State University, are active in Higher Educators in Linguistically Diverse Education (HELDE), an organization of professors from 16 different universities, school districts, and the Colorado Department of Education. HELDE works collaboratively to improve educational opportunities for bilingual ELs.

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WHERE COLORADO IMMIGRANTS WORK

Industry	Percentage U.S. Born	Percentage Foreign Born
Construction	6.4%	13.4%
Manufacturing	6.9	8.5
Agriculture, forestry, mining, fishing, and hunting	2.5	3.1
Education, health care, and social services	20.7	15.8
Professional, scientific, supervisory, administrative, waste management	13.4	15.6
Service Jobs	15.4	20.4

Source: 2013 American Community Survey, one-year estimates.

STEM Education: Redefining a Community

Jessica Beller

The fastest-growing jobs in the United States are those in fields related to science, technology, engineering, and math (STEM). Jobs like physician assistants, environmental science technicians, computer software engineers, and biomedical engineers are just a few among those found on U.S. Department of Education, U.S. Department of Labor, and Forbes lists. In response to the growing demand for STEM careers, our nation's schools have been investing in resources to support students in developing their STEM skills.

Although many schools across the nation have been introduced to STEM for over a decade, the Montrose County School District (MCSD) has merely tinkered with the idea but has now developed a plan to move toward STEM education. Since October 2015 (just three months after Stephen Schiell was named superintendent), the STEM movement has caught on in the schools and across the community. Superintendent Schiell and Director of Instructional Services Dr. Jessica Beller have identified STEM and problem-based learning (PBL) as a priority for at least the next five years.

MCSD encompasses two communities: Montrose and Olathe. Situated in rural Western Colorado, MCSD serves just over 6,000 students. The school district is the number one employer in the county, with more than 800 staff. Over the past five years, the school district has experienced

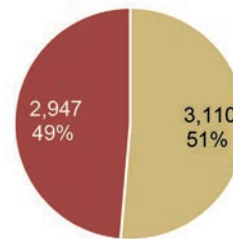
declining enrollment, diminishing state funds, and increasing demands to meet the needs of impacted populations.

As our nation moves toward STEM as a primary focus for schools, MCSD has begun researching the recipe for success. Through this research, the district has partnered with STEM Launch in Northglenn, Colorado. This school has developed a model for delivering instruction in a manner that is much different from what the majority of MCSD teachers are accustomed to.

For MCSD, STEM is not a term used to define a technology-heavy curriculum. Rather, MCSD believes that STEM can be used to define a classroom in which students are engaged in critical thinking, communicating, and collaborating to creatively solve real-world problems. STEM education is where innovative solutions are linked to careers and based on learning targets across multiple disciplines that create connections between school, community, and work. The learning process applied with STEM provides students with the

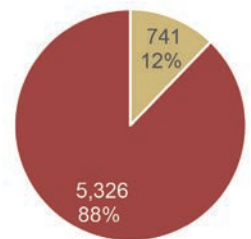
District Demographics Summary

Gender for District



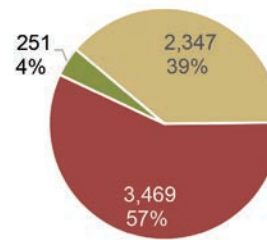
■ Male ■ Female

Disability for District



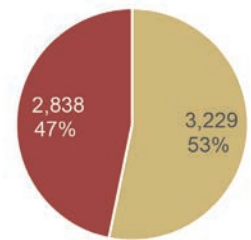
■ Yes ■ No

Ethnicity for District



■ Hispanic/Latino ■ White ■ Other

Meal Status for District



■ Free/Reduced ■ Paid

Source: Montrose County School District as of May 15, 2016.

opportunity to be competitive in the global economy.

While the term STEM oftentimes elicits a picture of technological devices and advanced learners, the model that MCSD will employ does not require such expectations. While the district plans to support instructional technology and increase rigorous application of science and math concepts, the intent of this movement is to transform the instructional delivery of all teachers, regardless of the subject area or grade



level. The belief is that instructional transformation must come first.

PBL will be the platform of this movement's delivery. Through this model, industry partners serve as experts in their field to support teachers in defining a problem for students to solve. Teachers guide students in a process of solving real-world problems tied to Colorado Academic Standards (CAS). The PBL model encourages students to be collaborative and innovative critical thinkers, and productive members of society. Together, the students research the problem and engage in inquiry and innovation to develop a prototype solution. This solution is then delivered




to professionals in the field where the problem exists. The process requires students to build "soft skills," including presentation, professionalism, and teamwork. The learning becomes ubiquitous, engaging not only the student but also the community, families, and teachers. Students see a direct tie to careers, they are exposed to rich feedback from community members and professionals, and they understand that they can make a difference!

Since this model relies on industry experts, MCSD has identified Montrose County's primary economic drivers. Those targets include (1) healthcare, (2) agriculture, (3) recreation and tourism, (4) advanced manufacturing, and (5) energy. The intent is to develop a system in which experts in these industries support the teachers and students in defining a worthwhile problem in the community that will offer students an exceptional learning experience and provide the company and community with a beneficial outcome. The outcomes of the PBL solutions will be tied to entrepreneurship or community service. Early exposure to these industries, community problems, and expert partnerships will provide students with a lens of opportunity that is not always present in traditional classrooms.

All of this is important for MCSD and the surrounding community: the community depends on the school system to deliver strong, competitive, competent employees. Through this

process, the district has developed an awareness campaign for the community. As part of this campaign, major community groups, companies, and community members have been engaged with understanding the importance of the PBL and STEM education movement. No matter the context of the presentation, the audience is overwhelmingly excited about the potential of this model to transform our community. Teachers are ecstatic, parents are anxious to see results, and businesses are waiting in the wings to come on board with this plan.

When MCSD completes its five-year action plan, it will have ubiquitous implementation: STEM will be in all schools and in all grade levels, and all teachers will be using it in the classroom. MCSD will be the first STEM district in Colorado. 

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THE BUSINESS OF EDUCATION IN COLORADO *continued from page 5*

for higher education was in the form of federal loans, which accounted for 49.9% of all financial aid given. The amount of federal loans has declined over the last three years, from \$1.3 billion to \$1.1 billion, while other forms of aid, such as state and institutional aid, have increased. According to the CDHE *Financial Aid Report 2014-15*, a total of 48% of students who received financial assistance in FY2014-15 were awarded

a Pell Grant. Since 2005, total state aid has nearly doubled (99.7%), due in large part to the increase in need-based grants (138.1%).

FTE students at four-year public institutions totaled 124,347 (67.6%) of the 183,960 full-time students in the state. Community colleges followed, with 28.8%, and local district colleges, with 3.6%. Data from the CDHE FTE Student Enrollment Report show that FTE student

enrollment peaked in FY2011-12 before declining each of the last three years, to 183,960 in FY2014-15. 

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