



2018 STATEWIDE TOWN HALL

Strengthening Higher Education and Tomorrow's Workforce

CONVENED BY NEW MEXICO FIRST

- Town hall participants urged to read this report before the event
- April 10-11, 2018
- Marriott Pyramid, Albuquerque, N.M.



NEW MEXICO FIRST

Copyright 2018

New Mexico First
P. O. Box 56549
Albuquerque, New Mexico 87187
Phone: 505-225-2140
Website: www.nmfirst.org

New Mexico First typically grants permission to reproduce all or part of this document for educational or public policy purposes. Contact us for reproduction authorization.

This material is based on work supported by the National Science Foundation EPSCoR Program under awards #IIA-1301346. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

Contents

Table of Figures	v	Lottery Scholarship	12
Executive Summary	vi	College Affordability Fund	12
Foreword	vii	Money Management and Student Debt	12
Purpose of this Report	vii	Strategies for University Success	13
About New Mexico First	vii	Online Courses	14
Report Reviewers	vii	Teacher Colleges	15
Where Do We Get Our Information?	viii	A Note on Jargon	16
Students	viii	Student Case Study: Success in Joint Bachelor’s/Master’s Program	16
Introduction	1	Allie Arning: New Mexico Tech, Senior in Environmental Engineering	16
High School Preparedness and Community College	2	Intersections and Conclusion	16
Key Considerations	2	Higher Education System	17
Education Data	2	Key Considerations	17
How Long Does It Really Take?	3	Higher Education System	17
Statewide Attainment Goal	3	Higher Education Governing Authority	18
Helping Students Make Informed Choices	3	Higher Education System and Institution Challenges	19
Career Prep in High School	4	Financial Health	19
Next Step Plan	4	TABLE: Examples of I&G Expenses	20
Dual Credit	5	Financial Aid	20
Early College High Schools	5	Governance Structure	22
Career and Technical Education in High School	5	Measuring Higher Education Institution Performance	22
Career Clusters	6	Accreditation	23
Supporting Underserved Students through Targeted Programs	6	State Performance Measures	24
ACT Testing	6	Additional Ways to Measure Performance	24
Understanding the Options	2	Reforms and Options	25
TABLE: Overview of Types of Degrees and Credentials	2	Reforms in motion	25
Opportunity Youth	3	creative solutions	25
Strategies for Success	3	Student Case Study: Successful Transfers	26
“15 to Finish”	3	Tessa Snyder, Multiple Campuses	26
Banded Tuition and Credit Caps	3	Intersections and Conclusion	26
Credit for Prior Learning	4	Workforce Integration and Alignment	27
Soft Skills	4	Key Considerations	27
Adult Education	4	The Economy, Population, Employment and Income	27
Remedial or Developmental Courses	5	The Exodus and Disparities	28
Corequisite Models	5	Occupations	28
Competency-Based Education	6	Gaps in Education, Skills	29
Case Study: Western Governors University	7	Comparing with Colorado	29
Student Case Study: Community College Pathway	7	Employer Survey	29
Chamisa Edmo – Pre-Engineering, Southwestern Indian Polytechnic Institute	7	Future Jobs, Education Required	30
Intersections and Conclusion	7	Table: Gap Between Jobs and Degrees	30
Exceling at Four-Year Degrees and Beyond	8	Sectors Projecting Growth	31
Key Considerations	8	Economic Development Hinges on Ready Talent	31
University Success Data	8	Jobs Council	32
Recruitment	8	The Bridge of Southern New Mexico	32
Retention	8	New Mexico Pathways Project	33
Completions	9	WorkKeys	33
Gender Gap	9	Workforce Innovation and Opportunity Act, State Plan ...	34
Informed Decision-Making	10	Industry-Based Innovations in Higher Education	34
Financing College to Support Completion	10	Job Training Incentive Program, Step Up	35
Complications of Financial Aid Systems	11	Five Ways to Connect College and Careers	35
		Student Case Study: Retraining for a Second Career	36

Greg Powe, Aerospace Project Management and Facilities	36	Student Case Study: Exceling in STEM	55
Intersections and Conclusion	36	Derrick Platero, Geosciences, New Mexico State University	55
Healthcare Workforce	37	Intersections and Conclusion	55
Key considerations	37	Appendix.....	56
Higher Education Institutions Healthcare Programs	37	Appendix A: Institutions of Higher Education and their Governance.....	56
Healthcare and the Economy	38	TABLE: Higher Education Institutions Established by State Constitution.....	56
Healthcare Workforce Gaps	38	TABLE: Branch Community Colleges.....	56
Quantifying the Workforce Gaps	39	TABLE: New Mexico Independent Community Colleges	56
Estimated Number of N.M. Providers Compared to National Benchmarks	39	Appendix B: Degree Types and Completions	57
Workforce Demographics	40	TABLE: Types of Degrees and Credentials (detailed) ..	57
Why We Need More Healthcare Professionals: Human and Economic Costs	40	Table: N.M. Certificates and Degrees, 2016-2017, Awarded by Ethnicity.....	58
New Mexico’s Behavioral Health Workforce Crisis	41	Appendix C: Changes in Tuition Rates, Public Institutions, 2004-2017	58
Financial Aid for Healthcare Students	41	TABLE: N.M. Tuition Data, 2004, 2010, 2018.....	58
Best Practices and Recommendations	42	Appendix D: Dual Credit Impact Data	59
NM Health Care Work Force committee Recommendations	42	TABLE: Remediation Rates for Dual Credit Students vs. All College Students in N.M.	59
Sun Path Consortium recommendations	43	Appendix E: Community College Non-credit Workforce Training	59
Recommendations from Other Sources.....	43	TABLE: Non-credit Workforce Training at New Mexico Community Colleges.....	59
Faculty and preceptorships.....	44	Appendix F: Higher Education Related Legislation, 2018 Legislative Session	60
veterans - an underutilized workforce	44	TABLE: Higher Education Related Legislation, 2018 N.M. Legislative Session	60
SUN PATH Consortium: A Community College Health Professions Best Practice	44	Appendix G: Student-Centered Communication	61
UNM Pipeline Programs: A Four-Year College and Beyond Best Practice	44	Occupational Data for Healthcare Administration	61
Collaborative Pipeline Programs:	45	Is Healthcare the Career for You?.....	61
Student Case Study: Preparing for a Health Career.....	45	Appendix H: Healthcare Workforce Pipeline Programs	62
Fabiola Perez, UNM College of Pharmacy.....	45	Collaborative Pipeline Programs	62
Intersections and Conclusion	45	UNM Health Sciences Center Pipeline Programs.....	63
New Mexico’s Energy Workforce.....	46	Appendix I: Energy Workforce Resources.....	64
Key considerations.....	46	Energy Commerce Major.....	64
More Energy Jobs Rely on STEM Education and Training.	46	New Mexico Energy Roadmap Workforce and Education Goals and Strategies	64
Higher Education and STEM.....	47	Appendix J: Mean Wage of New Mexico Occupations	65
Recruiting STEM Majors.....	48	Bibliography	66
Retaining STEM Majors.....	48		
Industry Role in Higher Education.....	48		
Energy Roadmap	49		
N.M. Energy Resources: History and Projections	49		
Oil and Natural Gas	49		
Renewable Energy	51		
Nuclear Energy	52		
Coal	54		

Table of Figures

Figure 1: Certificates & associate degrees earned, N.M.2

Figure 2: Four Corners states residents with associate degree or more, 20163

Figure 3: Educational attainment levels in New Mexico, working age residents, 20163

Figure 4: Percentage of N.M. students meeting ACT college prepared targets in all four subjects, by race/ethnicity, 20177

Figure 5: College retention, Four Corners states, 201513

Figure 6: College completion rates by race/ethnicity, compared with demographic breakdowns, 2016-201714

Figure 7: Number of university degrees awarded in New Mexico, 2012-201614

Figure 8: N.M. certificates and degrees, by award type and gender, 2016-201715

Figure 9: N.M. certificates and degrees, by gender, 2016-2017105

Figure 10: Percent change in tuition compared with other family expenses116

Figure 11: Map of Public Colleges and Universities in New Mexico22

Figure 12: New Mexico HEI Revenue and Expenses Overview24

Figure 13: Types and percentages of financial aid received by N.M. students, FY2016216

Figure 14: Unemployment rates, 2000-2017, N.M. and the U.S.32

Figure 15: Rate of projected growth by education levels, 2014-2024.....30

Figure 16: Major N.M. industry employment increases, projected, 2014-2024316

Figure 17: The Bridge of Southern New Mexico approach to workforce talent development.....32

Figure 18: The NMDWS oversees 21 Workforce Connection Centers. (NMDWS).....349

Figure 19: New Mexico energy jobs by technology, 201751

Figure 20: Treemap of Energy-Related Degrees, N.M. (National Center for Educational Statistics, 2017)52

Figure 21: Percentage of STEM degrees by type53

Figure 22: Number of energy degrees awarded in N.M., 201653

Figure 23: Oil production has reached record levels, but jobs lost before the last downturn have not rebounded.50

Figure 24: Forecasted energy use by source, through 2050.....51

Figure 25: Where Americans got their electricity, percent change from 2016-201751

Figure 26: Tuition increases in N.M., 2004-201763

Executive Summary

This background report summarizes information, challenges and opportunities for New Mexico's higher education system and its overall approach to workforce development. Our state's students are motivated, high-achieving people, and they maintain these characteristics despite having to overcome significant hurdles. Some students are the first generation in their families to attend college; others work multiple jobs while attending school. They are often returning to college to prepare for second careers. Our students come from urban, and tribal communities and often households functioning at or below the poverty line.

At the same, New Mexico's employers are facing challenges of their own. They want to strengthen the state's economy and create new jobs. They need future employees to help them achieve those goals. They find it is in their – and their communities' – best interests to see students succeed. This report offers a foundation in policy and program matters that can help advance those goals. The many topics are grouped into six chapters:

- CH 1: High school preparedness and student success in community college
- CH 2: Excelling at four-year degrees and beyond
- CH 3: Higher education systems
- CH 4: Workforce integration and alignment
- CH 5: New Mexico's healthcare workforce
- CH 6: New Mexico's energy workforce

Participants at the April 2018 statewide town hall will use this report as a *starting point* for discussion of potential reforms. By the town hall's conclusion, participants will develop a platform of consensus recommendations for policymakers, education leaders, industry and possibly others.

Chapter 1 of this report presents the importance of academic and career preparation in high school (for all students) and then the challenges and opportunities facing community college students in particular. Topics range from leveraging the benefits of dual credit, to overcoming the challenges of remedial education, to helping students finish credential and associate degrees on time.

Chapter 2 focuses more on the needs of students in bachelor's and graduate programs, but many of the issues presented also affect community college students. It addresses recruitment, retention and completion data for New Mexico colleges and universities, along with the myriad of challenges associated with navigating financial aid. It also offers concrete examples of best practices for highly impactful classroom experiences.

However, New Mexico cannot achieve student success without effective structures, governance systems and financial stability for its overall higher education system, and these are the subjects of **Chapter 3**. Creating a cohesive system that best utilizes the multiple boards overseeing or advising our 29 public colleges and universities is no small task, nor are options for setting clear performance measures to keep colleges and universities on track.

Employers in New Mexico care about all the issues above, because they rely on the today's students to become tomorrow's workforce. **Chapter 4** looks at the concrete matters of workforce integration including skills gaps, on-the-job training partnerships and the need to keep more of our people in-state (rather than taking jobs elsewhere).

Chapter 5 invites readers to consider the unique needs of the healthcare fields, with challenges prompted by the growing numbers of insured New Mexicans, many of whom live with chronic health problems. A solid foundation exists in New Mexico to expand our healthcare workforce pipeline, but shortages remain in many areas of the state – especially rural and tribal communities.

New Mexico's energy workforce is the topic for **Chapter 6**, selected in part because of the state's economic reliance on the industry. Roughly a third of general fund revenues comes from the energy sector. Changes in the industry point to job reductions for some fields and expansions for others. Expansion of STEM education remains a key strategy for meeting future needs and helping employees adapt to new opportunities.

Additional information on all these topics is offered in the comprehensive report that follows.

Foreword

Purpose of this Report

This background report informs the 2018 statewide town hall, **Strengthening Higher Education and Tomorrow's Workforce**, on April 10-11. Our state is rich in education and career opportunities, but also faces challenges. New Mexico First is working to overcome those obstacles by researching barriers to student success and convening a statewide deliberation on solutions.

The staff and board of New Mexico First believe that effective deliberations require a sound foundation in data, policy information, and the concerns surrounding higher education. All our town halls are preceded by a nonpartisan background report that sets the context.

Note: There are few right or wrong answers to any public policy question, and the problems and opportunities are complex. As a result, no explanation of the situation – including this report – can cover all information and opinions available. The people, policymakers, educators, community members and business leaders of New Mexico will lend their knowledge and expertise to the town hall.

About New Mexico First

A statewide public policy organization, New Mexico First engages people in critical issues facing their state and communities. The nonpartisan, nonprofit group produces comprehensive policy reports – primarily on natural resources, education, health and the economy. These analyses inform policy discussions, legislative options and student learning. The backgrounders also provide the foundation for New Mexico First's unique town halls and forums that convene people to develop proposals to improve the state. The reports are available at nmfirst.org. Our state's two U.S. Senators – Tom Udall and Martin Heinrich – serve as New Mexico First's honorary co-chairs. The organization was co-founded in 1986 by retired U.S. Senator Jeff Bingaman and the late Senator Pete Domenici.

Report Reviewers

This New Mexico First report was prepared by Heather W. Balas, Pamela K. Blackwell and Grant Taylor. The writing team was advised by the following committee members. Some offered input on the report as a whole, while others focused only on specific sections. We are grateful for their commitment to New Mexico's future.

- Del Archuleta, Molzin Corbin
- Connie Beimer, University of New Mexico (UNM)
- Jamai Blivin, Innovate-Educate
- Tracey Bryan, The Bridge of Southern New Mexico
- Celina Bussey, N.M. Department of Workforce Solutions (NMDWS)
- Claire Chase, Mack Energy Corporation
- Dana Christman, New Mexico State University (NMSU)
- Jon Courtney, N.M. Legislative Finance Committee (LFC)
- Todd DeKay, Eastern New Mexico University (ENMU), Roswell campus
- Travis Dulany, LFC
- Ron Eppes, Intel
- Maggie George, Innovate-Educate
- Steve Gomez, Santa Fe Community College (SFCC)
- Angelo Gonzales, Mission: Graduate
- Roxanne Gonzales, New Mexico Highlands University (NMHU)
- Robert Grassberger, UNM-Emeritus
- Randy Grissom, SFCC
- Rachel Gudgel, N.M. Legislative Education Study Committee (LESC)
- Sydney Gunthorpe, Central New Mexico Community College (CNM)
- Jerry Harrison, New Mexico Health Resources
- Tracy Hartzler, CNM
- Elfreda Harvey-Yazzie, San Juan College
- Vanessa Hawker, UNM
- Anne Jakle, N.M. EPSCoR
- Michelle Kavanaugh, Office of U.S. Senator Tom Udall

- Kathy Keith, Los Alamos National Laboratory (LANL)
- Hayley Klein, Artesia Chamber of Commerce
- Kristen Krell, N.M. SUN PATH Consortium
- Tessa Latson, Albuquerque Hispanic Chamber of Commerce
- Mark Lautman, Community Economics Lab
- Ashley Leach, NMDWS
- Carol Leach, Concho Resources
- Carlos Lucero, PNM
- Heidi Macdonald, LESC
- Jeff McCool, New Mexico Junior College (NMJC)
- Valerie Montoya, Southwestern Indian Polytechnic Institute (SIPI)
- Yolanda Montoya-Cordova, Albuquerque Public Schools
- Yash Morimoto, SFCC
- Bridgette Noonan, N.M. Higher Education Department
- T.K. O'Geary, Northrop Grumman Corp.
- Allan Oliver, Thornburg Foundation
- Elaine Perea, N.M. Public Education Department
- Courtney Puryear, NMJC
- Katie Richardson, Office of U.S. Senator Martin Heinrich
- Valerie Romero-Leggott, MD UNM Health Sciences Center
- Steve Saucedo, NMJC
- Samantha Sengel, CNM
- David Sexton, URENCO
- Joseph Shepard, Western New Mexico University (WNMU)
- Karen Trujillo, NMSU
- Steve Vierck, Economic Development Corporation of Lea County
- Mindy Watson, Clovis Community College
- David Williams, Office of U.S. Senator Tom Udall
- Peter Winograd, UNM-Emeritus

WHERE DO WE GET OUR INFORMATION?

Throughout this document, we provide as many data sources as possible. We draw from published reports, newspaper and journal articles, first-hand interviews and online resources. All direct quotes are from interviews conducted for this report unless otherwise noted. We know that policymakers, researchers and students use our reports, so we provide the details you need to learn more. Footnotes provide short references to complete citations in the bibliography.

Students

To better understand the educational system from the perspective of students, we conducted interviews. Thank you to all the students who took time to share their stories with us. We are so grateful for the hard work and dedication you show each day. You are already making a difference for your families and communities. Thank you also to research assistant and interviewer Gabrielle Ontiveros for her hard work and enthusiasm in developing the student content for this report. Student interviewees:

- Zoila Alvarez - UNM School of Law
- Allie Arning - New Mexico Tech
- Chamisa Edmo - SIPI
- Courtney Gavin - UNM, NMSU
- Adriana Lujan-Paez - UNM, WNMU
- Fabiola Perez - UNM
- Derrick Platero - NMSU, San Juan College
- Greg Powe - Doña Ana Community College
- Ariel Scott, MD - UNM School of Medicine
- Tessa Snyder - UNM
- Kyle Park Spolidoro - UNM
- Erica Velarde - UNM

Introduction

Increasingly, New Mexico college students do not fit the traditional image of the newly minted high school graduate who goes straight into college with relatively modest responsibilities. The fact is, we have more nontraditional students than ever before – students who are older, work jobs, and support families. Some are returning to school for retraining. In addition, our “traditional” students often assume financial burdens and other responsibilities for themselves or their families. Most New Mexico students are going to school and working to pay for school and living expenses. Many are first-generation college students overcoming barriers with courage and tenacity.

These students and others may wonder, what is the main purpose of higher education? The answer depends on who you ask. For parents of high schoolers, college hopefully leads to self-sufficient children who get good jobs. For freshman, college is a time to explore and learn. Young working parents often see education for themselves as a chance at a better financial future for their families, while educators may focus on the research opportunities their university affords. Employers want colleges to prepare skilled workers, at the same time policymakers wish for trimmed budgets, and communities look to universities for entertainment through athletics and the arts. Increasingly, higher education leaders are called on to manage the needs and expectations of different populations in an ever-expanding mission – and with ever-declining dollars.

Regardless which priorities colleges and universities focus on, today’s graduates are tomorrow’s workforce. Throughout the state, there are examples of higher education institutions and industries successfully working together to train and educate students so they may meet today’s and tomorrow’s workforce needs. The healthcare and energy sectors are two of our state’s most promising higher-paying industries. Hundreds of job vacancies exist in these sectors, but unfortunately New Mexico does not have enough qualified residents to fill the positions. At the same time, New Mexico is producing a high volume of postsecondary education graduates, many of whom either remain in our state underemployed or move away for better economic opportunities. Between the abundance of available jobs and lots of graduates, it becomes clear that more can be done to align the two. Tension also remains between whether institutions should focus more on singular job-based training versus agiler transferable skills such as critical thinking.

This town hall presents the opportunity for higher education professionals, students, community members and policy leaders to consider how to make the promise of higher education a reality. Our meeting will be organized into six discussion groups, which correspond to the chapters of this report:

Group 1:

- High school preparedness for all students
- Student success in community college

Group 2:

- Student success in four-year degrees and beyond
- Student finances in all types of college

Group 3:

- Higher education governance and financial systems
- Institutional evaluation and performance measures

Group 4:

- Overall workforce integration
- Imagining the diverse economy we want and building the workforce to advance it

Group 5: Healthcare workforce needs

Group 6: Energy workforce needs

Results from these discussions will be published in late Spring 2018, a separate report for New Mexicans.

Chapter 1

High School Preparedness and Community College

Keys to Student Success

New Mexico’s young people are smart, motivated, committed to their families and willing to work hard. They are a tremendous asset to our state, and our future is quite literally in their hands. It is essential that we provide young adults the support they need to excel academically and personally. When students finish high school, they need the ability to make informed choices about their potential careers and the types of jobs that are needed in New Mexico. In addition, our nontraditional students – perhaps returning to college later in life for retraining or to get their careers off the ground – often need similar information. All these students must select the best educational pathway to open the doors for their chosen careers. Many of those career goals can be met with the training provided through community colleges and trade schools. However, students and families often lack adequate information about the practical application of these degrees. Or, they require more sufficient preparation in high school for any type of degree. **This chapter focuses on high school preparation across the board and meeting the unique educational needs of students pursuing associate degrees or trade certifications.**

KEY CONSIDERATIONS

Reviewing these opportunities and challenges, readers see the urgency of this topic. How can we support high schoolers and returning college students in considering whether community colleges or trade schools are right for them? Are career pathways adequately clear? Do students know what jobs are likely to be available in New Mexico, and are they using that information to inform their college decisions? What roles do dual credit or high school vocational training play in preparing students for community college or trade school? And how can educators avoid “tracking” students into an education path that may ultimately prove *too* directed or narrow?

Education Data

Awareness of community college opportunities is growing, with the number of trade certifications awarded in New Mexico having increased 58 percent between 2012 and 2016. The number of associate degrees awarded during the same period remained about the same.¹

Economic development advocates often point to the need for increased numbers of graduates for all levels of education. Statewide, 37 percent of working age residents hold an associate degree or higher, which is the lowest percentage of the Four Corners states and places us in the bottom third of states nationally.² An additional 9 percent of New Mexicans hold a postsecondary certificate.³ (“Postsecondary” means any education delivered after high school.) As the following chart illustrates, 42 percent of the state holds a high school degree or less with no college. (This figure varies considerably by county, with a low of 18 percent in McKinley compared with a high of 75 percent in Los Alamos county.) In an era when most jobs require college training, this educational shortfall brings significant challenges for New Mexico’s people and economy. By 2020, an estimated 63 percent of New Mexico jobs will require college, just under half of those at the “some college” or associate degree levels.⁴ Meeting current and future workforce needs will require solid growth in degree earners by all races and ethnicities, as well as genders. (See Chapter 2 for data by race and gender.)

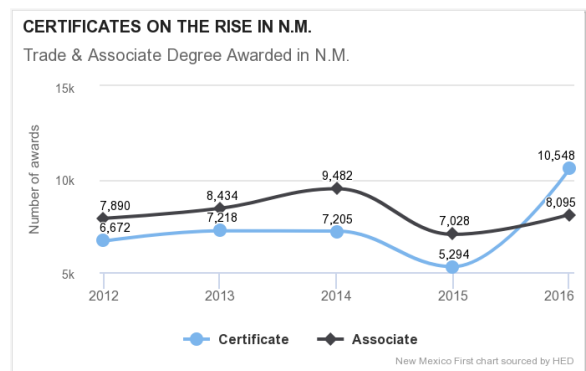


Figure 1: Certificates & associate degrees earned, N.M.

¹ (Higher Education Department, 2017)

² (ACS 2016)

³ (HED, 2014)

⁴ (Georgetown University, 2013)

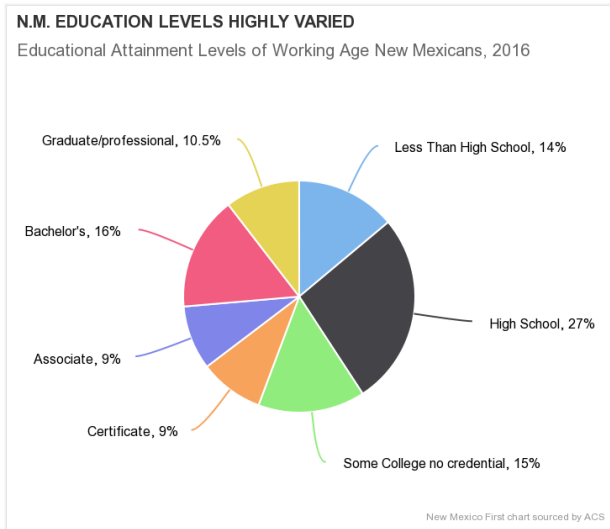


Figure 3: Educational attainment levels in New Mexico, working age residents, 2016

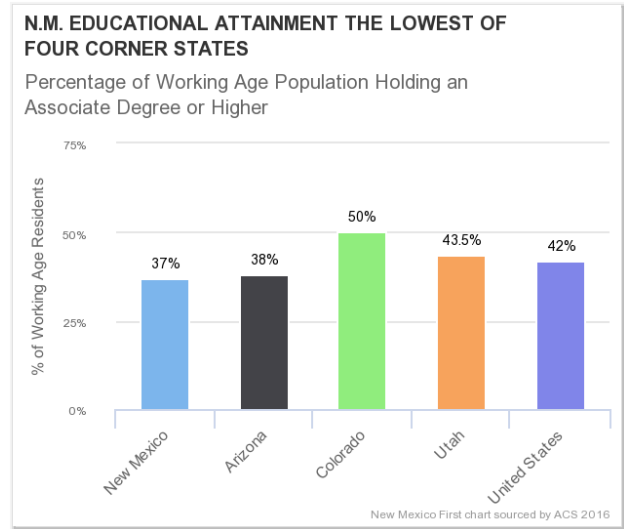


Figure 2: Four Corners states residents with associate degree or more, 2016

HOW LONG DOES IT REALLY TAKE?

In New Mexico, it takes full-time students about four years to finish a credential, regardless what type. Among full-time students completing certificates or degrees in 2014, the average time to complete the degree was:⁵

- 3.7 years for certificates
- 4.1 years for associate degrees
- 4.6 years for bachelor's degrees

None of these degrees are supposed to take that long. The durations reflect the reality that some students go to school part-time, and others change degree plans along the way, thus extending their time in college. The timeframes shortened about a year at each degree level for nontraditional students (defined as those 25 and older). By contrast, students who were required to take remedial courses took an average of six months longer to complete their credentials than the average durations above.

STATEWIDE ATTAINMENT GOAL

New Mexico's Higher Education Department (HED) established a goal that, by 2030, 66 percent of the working age population would have a postsecondary credential, including a trade certification, associate degree, or university degree. This goal is generally in line with the Lumina Foundation's national goal of 60 percent by 2025. It is, however, an ambitious target, given that an estimated 45 percent of the state currently holds some type of credential. Do members of the town hall have suggestions for achieving this goal?



Helping Students Make Informed Choices

Students, educators and employers report that students often lack key information to make good choices for their interests and circumstances. The first decision is whether to even go to college (including trade school). Students worry about whether they and their families can afford it, or whether it will be worth the effort. Once students cross that threshold and decide they do want some kind of college, many lack information about their options.

"Are we doing enough to help students explore their strengths and interests, and are we helping them understand that nearly any career they might pursue will require some level of post-high school education?" asked Angelo Gonzales of the Albuquerque-based organization Mission Graduate. He and others interviewed for this report

⁵ (HED, 2014) Note: This dataset does not include certificates of achievement that can be completed in less than one year.

observed that some students do not have the information to even consider community college or trade certificates. In other cases, when high school counselors share information about the trades, some families object because they worry their children are being tracked into “less promising” futures.⁶ These types of challenges are closely linked to equity considerations associated with how institutions prepare young people for their futures, including the hopes and dreams of their families.

Whether students attend community colleges or four-year universities (or some combination), national data indicate they are doing it to improve their work outcomes.⁷ In one of the largest national studies on record, a strong majority of education consumers (58 percent) report their *primary* motivation for college is getting a good job, not general pursuit of more knowledge, meeting family expectations, or doing what their friends are doing. The motivation was almost identical among men and women. The same study – which included nontraditional students – found that people who did not complete their degree wish they would have pursued a different major. Both these findings point to the potential benefits of early career counseling.

As noted in the introduction, the more education students receive, the more earnings they take in over the course of their lifetimes. On average, earnings increase between five to 15 percent for every year of college. People with at least some college earn an average of \$200,000 more over their lifetimes than students with a high school degree only. For graduates with an associate degree, that number increases to \$280,000. A registered apprenticeship program can increase lifetime earnings by \$240,000.⁸

Career Prep in High School

Overall, this report focuses primarily on higher education reforms. However, the linkage with high school preparation cannot be overlooked. Adequate preparation in high school is an essential ingredient to success in either community college or university. The information is included here, but it is equally relevant for Chapter 2.

Multiple students and researchers interviewed for this report recommended more concrete information in high school for students to find pathways to successful careers. Many resources exist – at high school and college levels – but it appears that students often do not know about those supports. Young people also report that high school students know little about the pros and cons of community college and university. They say students know the Lottery Scholarship exists to help pay for college, so they assume they will go to a college – and for many the general assumption is a four-year school. That path is right for some students, not others. The following high school strategies apply equally to community college and university students.

NEXT STEP PLAN

Expanding the use and utility of the Next Step Plan might be one option to help students sort their options. In New Mexico, students develop this personalized written plan, starting in eighth grade. They update it annually until graduation.⁹ The purpose of the plan is to target the student’s career interests and to lay out the corresponding courses that line up with those goals. Each plan is developed in partnership with parents and a school counselor. The plan is intended to include career goals, college plans, financial aid exploration, and an examination of industry certification or other job options. These objectives imply that students are receiving solid information on all types of education, but local implementation of Next Step Plans varies considerably.¹⁰

New Mexico lawmakers in the 2018 legislative session considered a bill (House Bill 23) that would have amended the Next Step Plan to require students to apply to a postsecondary educational institution, an internship or apprenticeship, or military service prior to graduation. The bill did not pass but generated considerable discussion about the role of the state in students’ lives after graduation, and whether applying for a job immediately out of high school should have been one of the options. Student completion of a final Next Step Plan is not a legal graduation requirement, but PED encourages it for all students.

⁶ These concerns are not limited to New Mexico families. Nationally, parents worry about their children pursuing technical training instead of the traditional 4-year college path, according to Georgetown’s Anthony Carnevale. (Sanchez, 2016)

⁷ (Strata Education Network)

⁸ (U.S. Congress, Joint Economic Committee, Foundation for Economic Success, 2017)

⁹ (PED)

¹⁰ (LESC, 2018)

DUAL CREDIT

Dual credit courses are classes completed in high school that enable students to also earn college credit. The courses usually count as electives for high school. These courses can fast-track undergraduate or vocational degrees, and students do not pay tuition. In some cases, modest course fees apply. For example, San Juan College offers over 400 courses students can take for dual credit, all online or on its campus.¹¹ Courses range from accounting to Navajo rug weaving, to chemistry. Course fees cost between \$0 and \$40.

Dual credit courses are available for all types of students and may be particularly beneficial for people in underserved populations. “For example, if you are a first-generation college student, dual credit is a great opportunity to experience the college environment,” commented Sydney Gunthorpe of CNM, interviewed for this report. “How do you even begin to imagine your academic future if you don’t know anything about college? Dual credit helps you find the front door.”

Over 20,000 New Mexico students (about 20 percent of high schoolers) took at least one dual credit course in 2016.¹² The courses are intended to improve high school students’ preparedness for college and shorten the time needed to complete a certificate or degree. For many students, these aims are met. New Mexico dual credit students are less likely to require remediation in college and – as a whole – they complete a college credential in less time than peers who do not.¹³ (Remedial courses provide basic instruction, most often in math and English, that students need before taking college-level courses. See page 5.)

The state invests significantly in dual credit courses. In FY16, the Legislative Finance Committee reports that the Legislature appropriated \$37 million to public high schools for dual credit course, plus an estimated \$16.4 million in higher education funding formula compensation for the colleges and universities that deliver most of the courses.¹⁴ Many people say this money is well-spent: an independent analysis prepared by the nonprofit Bridge of Southern New Mexico shows positive returns on investment – or ROI – for both the state and families for dual credit.¹⁵ However, given the amount New Mexico spends and the overall desire to see the dual credit program make an even greater impact, various reforms were recently proposed by a Dual Credit Council comprised of PED and HED staffers. The reforms would require dual credit students to:

- Tie their courses to their Next Step Plan or meta-major
- Demonstrate academic readiness for college coursework (i.e., assessment or placement test)
- Take dual credit courses for regular grades (not pass/fail or audit)

EARLY COLLEGE HIGH SCHOOLS

This type of program – often organized as a charter school – offers rigorous curriculum starting in ninth grade that enables students to take college-level courses in high school.¹⁶ Students may concurrently earn a high school diploma and a college-level credential or degree. In some cases, these tuition-free schools serve traditionally underrepresented students, including low-income, first-generation college-goers, students of color and English language learners. Early college programs can operate as stand-alone schools, be located within a larger high school, or exist on a college campus. New Mexico currently operates 24 early college high schools. The Education Commission of the States reports that some states fail to set clear policies or dedicated funding streams, resulting in schools that fall apart when a dynamic founder leaves or seed funding dries up. It may be valuable for New Mexico to assess sustainability planning for these programs.

CAREER AND TECHNICAL EDUCATION IN HIGH SCHOOL

What used to be called “vocational training” was phased out of many schools in recent decades. Today, it is often referred to today as “career and technical education.” Whatever the name, increasing numbers of educators and parents in New Mexico and nationally call for more of this type of programming in high schools, giving students

¹¹ (San Juan College)

¹² (LFC, 2017)

¹³ (LFC, 2017)

¹⁴ (LFC, 2017)

¹⁵ (Bridge of Southern New Mexico, 2017)

¹⁶ (Education Commission of the States, 2016)

more hands-on preparation for the workplace. Some people point to vocational training as a strategy to better serve more boys, who generally graduate in lower numbers than girls. (See Chapter 2 for graduation data by gender.) Career and technical education can include traditional activities like “shop class” where students learn carpentry, plumbing, welding or auto repair. Or, training can focus on subjects like computer science, 3D modeling, healthcare or culinary arts.

CAREER CLUSTERS

New Mexico’s Public Education Department encourages high school students to explore career clusters, publishing a guide offering information on 16 clusters and 77 related career pathways.¹⁷ The information is also presented in a somewhat interactive format at the New Mexico Programs of Study website. Students are urged to explore career options in eighth grade and, with their families, select an area to pursue in high school. Specific high school courses are recommended based on students’ interests. Clusters include:

- | | |
|--|--|
| 1. Agriculture, food and natural resources | 9. Hospitality and tourism |
| 2. Architecture and construction | 10. Human services |
| 3. Arts, audio/video and communications | 11. Information technology |
| 4. Business, management and administration | 12. Law, public safety, corrections and security |
| 5. Education and training | 13. Manufacturing |
| 6. Finance | 14. Marketing, sales and service |
| 7. Government and public administration | 15. Science, technology, engineering and math |
| 8. Health science | 16. Transportation, distribution and logistics |

SUPPORTING UNDERSERVED STUDENTS THROUGH TARGETED PROGRAMS

One federal program is known as GEAR UP (officially named Gaining Early Awareness and Readiness for Undergraduate Programs). It aims to increase the number of students going to college. Funded by the U.S. Department of Education, New Mexico’s program serves approximately 11,000 students in 25 high schools, several serving tribal communities. GEAR UP also serves first-year college students, supporting their transition to higher education. The state’s program advances the following goals:¹⁸

- Increase student and family knowledge about post-high school education.
- Increase high school graduation and college enrollment rates of GEAR UP students.
- Improve the academic performance of students so that they are prepared to do college-level work.

Educators and families may need to explore how to advance these goals if the program is not funded beyond 2019. It is currently in the sixth of a seven-year grant. A related program is AVID, which stands for Advancement Via Individual Determination. The program deploys unique teacher professional development that focuses on students’ academic needs and goal-setting. It also provides key skills that can help high school students succeed in Advanced Placement courses. Most participants are middle and high school students who would be the first in their families to attend college. The AVID program is offered in over 50 locations in New Mexico, roughly half in Albuquerque.¹⁹

ACT TESTING

One measure of students’ preparedness for college is the ACT, a college admission exam completed by about 60 percent of students nationally.²⁰ The test establishes college-readiness benchmarks in four areas that predict how well students are prepared for college courses. The subjects are English, math, reading and science. In New Mexico, 18 percent of test-takers in the 2017 graduating class met the college readiness benchmarks in all four areas (compared with 27 percent nationally).²¹ Significant racial and ethnic achievement gaps exist across these scores, with White and Asian students far more likely to meet the benchmarks than Hispanic, Native American and

¹⁷ (PED, 2017)

¹⁸ (HED)

¹⁹ (Rudnick, 2017)

²⁰ (ACT, 2017)

²¹ (New Mexico Kids Can, 2018; ACT 2017)

African American students. The gap was relatively consistent across subjects. Other than Asian students, test-takers of all backgrounds scored notably better on English and reading than on math and science.

These benchmarks point to the need to improve college preparedness for all high schoolers and particularly for students of color. The lack of preparedness leads to remedial coursework in college, a challenge that notably reduced college completion at community college and university levels. Engaging more students in Advanced Placement courses is one strategy to improving college preparedness.

Understanding the Options

Students across the nation, including in New Mexico, often struggle to understand potential career options and choose a college major. It seems clear that some students do not really know the difference between the types of community college or university degrees, or which degrees might lead to the personal and financial futures they might want.

A lot of useful data is available, just posted in different locations. For example, the New Mexico Department of Workforce Solutions (DWS) publishes labor statistics on predicted job availability. And many students receive the career cluster information described above. It appears that some type of crosswalk between the higher education options presented below, DWS data on in-demand careers, labor and earnings information, and career clusters might prove beneficial for students. Reviewers of this document reported that different government and education officials may be attempting to compile this type of synthesis. Additionally, the types of basic information in the following table appear to be absent from many students' and families' college decision-making. This challenge is especially true among first-generation students and other underserved populations.

TABLE: OVERVIEW OF TYPES OF DEGREES AND CREDENTIALS

Credential	How Long Should it Take? ²²	Notes
Associate Degree	2-3 years	Designed to prepare student to transfer to a bachelor's program
Applied Associate Degree	2-3 years	Career degrees intended for immediate entry into the workforce
Apprenticeship	3 - 5 years	Blocks of courses offered in conjunction with trade organizations
Certificate of Completion	1-2 semesters	Credential that is not a college degree; it prepares people to enter specific occupations or upgrade workplace skills
Certificate of Achievement	1 semester or less	Credential that can be completed quickly to prepare students to enter specific occupations or upgrade workplace skills
Bachelor's Degree	4 years	Degree preparing students for various careers
Graduate Degree	2-5 years after Bachelor's	Advanced degree preparing students for various careers
Professional Degree	3-7 years after Bachelor's	Advanced degrees for specific careers, such as physicians or attorneys.

See Appendix B for a more detailed version of this table, including examples of majors.

In addition to considering what types of degrees to pursue, students and families need to know how much they will cost and what types of financial aid might help. This is a significant issue affecting both community college and university students. See Chapter 2, page 10.

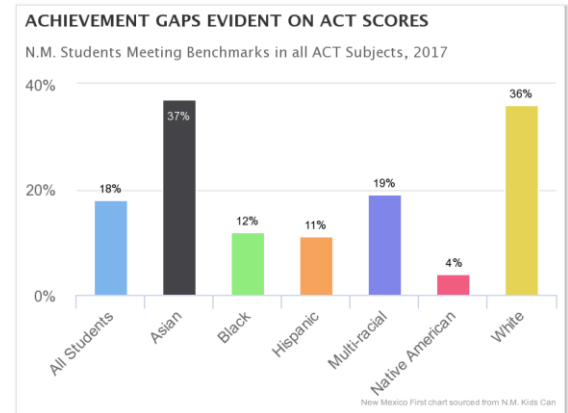


Figure 4: Percentage of N.M. students meeting ACT college prepared targets in all four subjects, by race/ethnicity, 2017

²² The time to complete a degree is based on 15 credits a semester. Most students take longer to complete education.

Opportunity Youth

Across the nation, 4.9 million American youth ages 16-24 are both out of school and not working.²³ That's one-in-seven young people who are disconnected from our economy and educational systems. New Mexico has the highest rate of disconnected youth in the nation, at 17 percent.²⁴ Described in this report as "opportunity youth," this group includes young people who are eager to further their education, gain work experience and help their communities. Roughly half of opportunity youth are people of color. Multiple organizations, employers and schools are working to maximize the potential of these young people, helping them find their next destination – whether that be college, the workplace or some combination.

Examples of efforts include:²⁵

- Year-long training programs that combine six months of classroom training on career skills with six months of employer internships, preparing young people for good jobs
- Outreach efforts tied to the WorkKeys testing program, helping young people identify skills gaps or employment options for which they are qualified
- Hiring programs from companies including Gap, CVS or American Express specifically reaching out to opportunity youth
- Service corps, including one organized by AmeriCorps, that connects opportunity youth with environmental stewardship projects

Strategies for Success

Students who choose community college experience unique challenges and opportunities. National data points to some common predictors of success, measured by completing an associate degree or trade certification:²⁶

- **Get started in high school.** Students who earn dual credit, get good grades, and take a college entrance exam before leaving college are more likely to complete their credential.
- **Start college strong.** Earning a good GPA and completing a full load of credits in the first year of college are the strongest overall predictors of completion success.
- **Don't wait.** Delaying enrollment into college, or enrolling in an out-of-state community college, significantly reduce the probability of finishing.
- **Have some fun.** The direct-from-high school students who participated in extracurricular activities when first enrolled are more likely to graduate.

"15 TO FINISH"

Given that both community college and university students struggle to finish school on time, considerable attention occurs across the nation about the causes. An associate degree is generally thought to take 60 credit hours, which, at 15 hours a semester, can be completed in two years. Complete College America's "15 to Finish" campaign draws attention to the fact that most students do not take that course load. Some attend part time, or others enroll in 12 hours a semester – which is the official threshold for "full time" and is the amount required to receive federal financial aid. At that number of hours, students pay the minimum amount for full-time tuition and they have more time to work part-time jobs. However, that pace can add an additional one or two semesters to completing a degree. The result: students either do not graduate, or they graduate late, all the while taking on additional debt and delaying their career goals.²⁷

BANDED TUITION AND CREDIT CAPS

One strategy to advance on-time completion – at both community colleges and universities – is banded tuition, which is most often a flat rate for full-time students taking between 12 and 18 credit hours. This approach gives students a financial incentive to take 15 or more credits a semester, since doing so does not cost any more than

²³ (100,000 Opportunities)

²⁴ (Social Science Research Council)

²⁵ (Harvard Business Review, Year Up, Innovate Educate, Corps Network)

²⁶ (American Council on Education)

²⁷ (Complete College America)

taking 12. The approach lets students save tuition money for each semester they take more than 12 credit hours, and they save on living expenses by completing their degrees one or two semesters earlier. Examples of this approach exist on campuses in Indiana, Illinois and Minnesota. In Indiana, the changes took effect due to state legislation in 2013. Evaluation of the law, published one year later, showed immediate increases in the numbers of students enrolling and completing 30 credit hours a year.²⁸ In New Mexico, practices vary by institution. Some schools offer banded tuition for students taking 12 or more credit hours; others offer a flat tuition for students taking 15 or more; others charge by the credit hour, regardless of number.²⁹

Some states deploy another approach – credit caps – to promote on-time completion. These policies place a cap on the number of credit hours required for degrees. Why? Even if students do take 15 credit hours a semester, many associate degrees cannot be completed in four semesters. Additionally, course pathways are not always clearly laid out by schools. To help address this issue, some states including Minnesota place caps on credit requirements, ensuring that associate degrees take no more than 60 credit hours and bachelor’s degrees no more than 120. Opponents of credit caps argue that some degrees are more complex and simply require additional courses.

CREDIT FOR PRIOR LEARNING

College is not the only place people gain knowledge and skills. Some campuses offer credit for prior learning, such as work experience, employer training programs, military experience or community service. In 2016, the New Mexico Legislature passed Senate Bill 153, requiring state colleges and universities to provide appropriate academic credits to veterans and military personnel. Policies to implement this law are in development and may vary by institution. At least Santa Fe Community College, CNM, San Juan College and New Mexico Junior College offer credit for prior learning. Nationally, the Council for Adult and Experimental Learning offers resources and quality standards on granting college credit from life experiences.³⁰

SOFT SKILLS

Increasingly, community colleges teach workforce readiness skills, also known as “soft skills.” These can include phone etiquette, customer service and reliability. Social traits, too, such as empathy, adaptability, cultural awareness and curiosity are increasingly important to job success and sought by employers.³¹ For example, multiple degree plans offered by Navajo Tech specifically list soft skills among their learning goals.³²

ADULT EDUCATION

The HED’s Adult Education Program assists adults, including parents and English Learners, to become literate and obtain the knowledge and skills necessary for employment and economic self-sufficiency. In 2017, the programs served 12,755 students through 27 programs in the state. The programs aim to provide instructional services for educationally disadvantaged adults. Participants are eligible if they: lack sufficient mastery of basic educational skills to function effectively in society; do not have a high school diploma or its equivalent; or are unable to speak, read, or write the English language fluently.³³

Related, the Integrated Basic Education and Skills Training Program (I-BEST) is a nationally recognized model that boosts student literacy and work skills. It enables students to study exactly what they need to complete their chosen certificate program. The program connects students with support systems including a cohort of peers as well as a team of advisors and teachers.³⁴

²⁸ (Indiana Commission for Higher Education, 2015)

²⁹ Regarding tuition in general, U.S. Senator Martin Heinrich introduced legislation this month to provide two years of tuition-free access to community or technical college programs that lead to a degree or industry-recognized credential.

³⁰ (Council for Adult and Experimental Learning)

³¹ (NMDWS, New Mexico Employer Survey, February 2014)

³² (Navajo Tech, 2016)

³³ (HED Annual Report, 2017)

³⁴ (Santa Fe Community College)

Remedial or Developmental Courses

In New Mexico, almost 40 percent of high school graduates who enroll in our state colleges are not academically prepared and must take remedial courses to catch up. Many of these students are low-income or people of color. The classes, also called developmental or “sub-college” courses, most commonly address math and English (which includes reading, writing and comprehension). The remedial courses are intended to get students caught up so they may start earning college credit. However, remediation is often described as the “black hole” of college, creating a costly barrier that some students never get past. Others advance a little farther in their education, but do not complete a certificate or degree. Along the way, these students often accumulate debt that can be difficult to repay since their college investments do not necessarily lead to higher earnings.

Many education experts have called for new ways to get students into the actual “gateway” classes (such as freshman English or algebra) that are required for the rest of their courses. In New Mexico, the HED has encouraged all campuses to research alternative remediation models, select one that might work for their faculty and students, and test it. Faculty at CNM report positive academic results with a paired-course model for freshman English. In 2015, UNM largely discontinued its remedial education through the introduction of stretch and instructional learning time models.

In 2016, the New Mexico English Remediation Task Force released the following recommendations:

1. Use multiple measures (placement tests, high school GPA, diagnostic essays) to place incoming students.
2. Offer accelerated corequisite courses to move most developmental students into college-level writing courses with additional support.
3. Continue traditional remedial courses but increase student support to move them more quickly into college-level composition.
4. Implement or support existing “early alert” systems to support struggling students.
5. Support writing centers to serve students.
6. Create a statewide system for sharing resources and reporting data in a more accessible manner.³⁵

These recommendations have not been officially adopted statewide but are being considered on a case-by-case basis on campuses.

COREQUISITE MODELS

New Mexico is part of a national organization, Complete College America, that advances “corequisite” approaches to remedial education. These approaches allow underprepared students to enroll directly in college-level gateway classes but provide additional academic support at the same time. Some schools, including all the campuses in the California State University system and the state colleges in Tennessee, have stopped offering remedial classes entirely. In Tennessee, after one semester of corequisite remediation, 64 percent of students passed the connected gateway math course.³⁶ This rate is quite high, compared with standard remediation approaches nationally, in which 22 percent of students with remedial needs complete a gateway math course in two years.

Common approaches include:³⁷

- Paired-course or models (students take the developmental and gateway classes in the same semester, often taught by the same instructor in back-to-back courses)
- Extended instructional time (additional classroom instruction added to a specially designed gateway course, sometimes with one additional credit)
- Stretch models (a one-semester course gets stretched to two)
- Accelerated learning model (similar to paired-course models, but students take the developmental course in a small class and join with college-level students in the gateway course)
- Academic support service models (students enroll in the regular gateway class but are required to take part in support services like tutoring or instructor office hours)

³⁵ (NM English Remediation Task Force, 2016)

³⁶ (Complete College America)

³⁷ (LESC, 2017; Daugherty, 2017)

- Technology-mediated support models (students enroll in a gateway class – usually comprised entirely of other developmental education students – and they take a separate online lab)

Other approaches attempt to reduce the number of students tracked into developmental education by assessing college readiness in multiple ways (instead of one placement test). Additional factors that can be considered include high school GPA, the number of years since the student was in school, or the number of relevant courses taken in high school. One study found that combining these assessment factors lowered remediation rates by 8 percentage points in math and 12 in English, while maintaining or improving completion rates.³⁸

Not everyone agrees with corequisite models, however. Some New Mexico educators worry about the accelerated pace being problematic for some students.³⁹ They fear that students without enough foundational skills will be unsuccessful in a corequisite course model. Some educators believe the standard remediation courses may be a better fit for some nontraditional students who are returning to the classroom after several years away from school. Nationally, concerns exist around faculty development and workloads, as well as how to determine if a student should be eligible for corequisite education.⁴⁰ Faculty in California strongly protested remediation reforms, fearing they would lead to reduced academic standards overall.⁴¹

COMPETENCY-BASED EDUCATION

Competency-based education (CBE) offers another tool to reducing the need for remedial coursework and moving students toward their academic goals more quickly. The approach can also be used with regular courses. It enables learners to move ahead at their own pace when they demonstrate mastery of the intended skills. It can be used at high school and college levels. For example, a typical college course takes 15 weeks. If a student placement test demonstrates proficiency in all but one of required skills, a CBE model can let the student learn that one skill in perhaps two or three weeks, and then move on to additional coursework.

The content is generally offered online, and timing is more flexible than traditional courses. The Lumina Foundation, a national education policy organization, identified CBE as a particularly promising strategy for reducing inequity in higher education. By measuring what students know, rather than whether they completed a particular class, schools may enable learners to move forward in their education more quickly. The programs often offer customized content coupled with a “high-touch” approach to the online instruction (i.e., significant contact with online instructors). As a result, CBE potentially enables busy students to advance their educations while meeting family and job obligations.⁴² The foundation points to several priority opportunities for CBE application:

- Targeted programs for developmental or remedial education
- Overall certificate and degree programs from community colleges or universities
- New forms of credentials, such as microcredentials and digital badges
- Workforce training programs, ideally targeted to occupations in high-growth areas (i.e., computer science) or high need (i.e., frontline community workers)

Concerns exist about CBE, however.⁴³ Some educators worry that students who take a lot of courses through a CBE model miss out on the rich learning environment that occurs in a traditional classroom. Part of college, they say, is the campus environment. Students in CBE courses are less likely to learn from their peers or engage in dynamic classroom discussion that dissects a subject thoroughly. The CBE courses are more likely to focus on skills rather than disciplines or ideas. As a result, it appears a CBE model works better for some subjects than others. Issues also exist with paying for the courses, since federal financial aid models are designed around the assumption of traditional credit hours. Financial aid does not pay for “correspondence courses”, so institutions must design the CBE courses to be more hands-on. Currently the U.S. Department of Education limits the number and type of CBE courses that can be paid for via financial aid.

³⁸ (U.S. Department of Education, 2017)

³⁹ (NM English Remediation Task Force, 2016)

⁴⁰ (California Acceleration Project)

⁴¹ (Zinshteyn, 2017)

⁴² (Lumina Foundation, 2017)

⁴³ (Chen, 2017; Gunthorpe, 2017)

These concerns point to potential needs for policies and procedures, particularly around quality standards and student-faculty interaction. Currently, CNM is the only public New Mexico college with a CBE program approved by the Higher Learning Commission. The application took six months to approve.

CASE STUDY: WESTERN GOVERNORS UNIVERSITY

The nonprofit, online Western Governor's University is probably the best-known provider of CBE. It offers degrees, each with a set of "domains" and "sub-domains" that specify competencies the student must demonstrate. Students progress by passing assessments associated with their degrees. Assessments can include problem-solving assignments, standardized exams, essays, projects and research papers. Faculty mentors support the process. Students are admitted to the online school on a monthly basis and work their way through each competency at their own pace. Students who already possess certain competencies may accelerate their programs either by transferring in credits from other colleges or taking assessments. Tuition is charged at a flat rate for each six-month term, during which students may complete as many competencies as they can. The more they complete each term, the less costly their degree becomes.⁴⁴

Student Case Study: Community College Pathway

CHAMISA EDMO – PRE-ENGINEERING, SOUTHWESTERN INDIAN POLYTECHNIC INSTITUTE



Breaking into STEM fields was a challenge for Chamisa Edmo, one shared by other Native American students. In Chamisa's case, guidance counselors at her first college "didn't know a lot about the different programs offered. So I picked American Indigenous Studies (AIS). I wasn't that interested, but it's what was available." She expanded her interests and is now in her last trimester at the Southwestern Indian Polytechnic Institute (SIPI), set to receive an associate degree in pre-engineering. At SIPI she has felt supported and has taken advantage of multiple learning opportunities through the school. Her combined AIS degree and engineering focus will allow her to achieve her dream of working on tribal infrastructure projects.

Chamisa's education and background have given her a unique perspective that values tribal issues being solved by individuals from the local community. She recommends that institutions, professors and students work together to overcome tribal student barriers to higher education including empowering students to practice self-advocacy and training faculty to better engage Native students. She also suggests that providing students with project-based learning curriculum related to native community issues and opportunities to interact with Native American engineers offer impactful ways to support Native American STEM students in particular. Chamisa has bright vision for her future: "So many of my ideas are based on tribal students, and how to bring STEM to them. It's going to be powerful no matter what I do."

Intersections and Conclusion

Community college students can benefit from the possibilities of shorter spans in college, less student debt and concrete career credentials to move them into the workplace. However, they can also face significant challenges that hinder students' abilities to complete their degrees or certifications. What changes might New Mexico high schools, colleges or policymakers enact that would enable more students to navigate this path successfully? This chapter illustrates opportunities to strengthen high school preparation, both in academics and career options. It also points to potential reforms in college remediation and competency-based education. All these issues overlap with student success at four-year schools as well, presented in Chapter 2. Additionally, the direct workforce application of many community college degree or certificate programs tie to the workforce alignment discussions in Chapters 4, 5 and 6. An integrated consideration of the needs of community colleges and their students can reveal opportunities to strength New Mexico's future.

⁴⁴ (Chen, 2017)

Chapter 2

Exceling at Four-Year Degrees and Beyond

Student Success at University

Ask people to visualize success in college, and many imagine caps, gowns and the loud sound systems of graduations. It is a nice image, and yet academic achievement begins years before students parade to strains of *Pomp and Circumstance*. The New Mexicans who complete university degrees have overcome financial hurdles, family challenges and, usually, held one or more jobs at the same time. Most of our graduates are women, and the majority of New Mexicans who complete college are either Hispanic or Native American. Regardless of gender or ethnicity, our students – and others around the country – want to succeed in the workplace but often lack information that might help them select majors that can lead to jobs here at home. **This chapter focuses on academic success for all college students, especially those pursuing university degrees.** That said, many of the issues discussed apply also to community college students.

KEY CONSIDERATIONS

How can New Mexico ensure that students who begin college actually finish? To what degree are we meeting the needs of underserved populations, and how can we do better? How can we help our students get the financial aid they need, and then successfully pay off their student loans? And how can we ensure high-impact learning for all students – especially for those who may not know how to seek out these rich experiences?

University Success Data

Recruit. Retain. Complete. These three goals drive many activities in universities. The goals are more than just numeric metrics; underneath the numbers lie opportunities to both honor good work and identify potential improvements.

RECRUITMENT

Roughly 32 percent of New Mexicans ages 18-24 are enrolled in college, so one statewide priority is increasing that number.⁴⁵ Additionally, postsecondary enrollment has declined across the board, affecting both universities and community colleges. The number of enrolled students in New Mexico declined by over 21,000 between 2010 and 2016.⁴⁶

RETENTION

In addition to wanting more students to enroll in college, school leaders and policymakers track how well universities retain students beyond their freshman year. This is a key predictor of future academic success. Among students in four-year schools, New Mexico retains about 72 percent of incoming freshmen into their second year.⁴⁷ In 2015, for example, over 37,000 New Mexico students left college before their sophomore year. We rank below the national average of 80 percent, and far below the top state, California, where almost 87 percent of college freshman continue their schooling. Figure 5 compares New Mexico with our Four Corners neighbors, illustrating that all these western states struggle with this measure, none surpassing the national average.

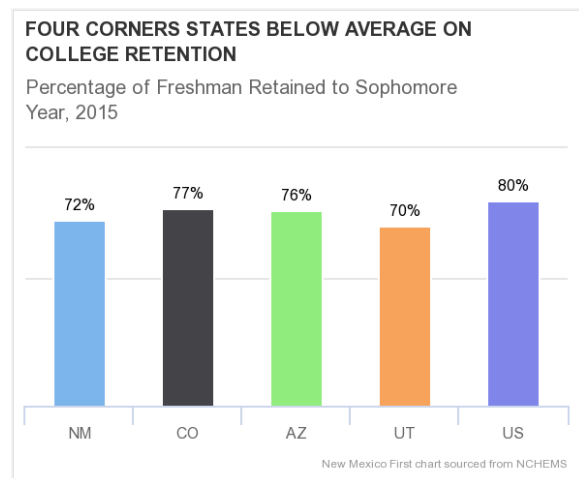


Figure 5: College retention, Four Corners states, 2015

⁴⁵ (NCHEMS, 2015)

⁴⁶ (HED)

⁴⁷ (NCHEMS, 2015)

COMPLETIONS

The number of New Mexico students graduating with bachelor's, graduate and professional degrees has remained reasonably steady in recent years, with modest declines in the last two years. As noted in Chapter 1, these are the same years the state saw increases in the numbers of associate degrees and certificates.

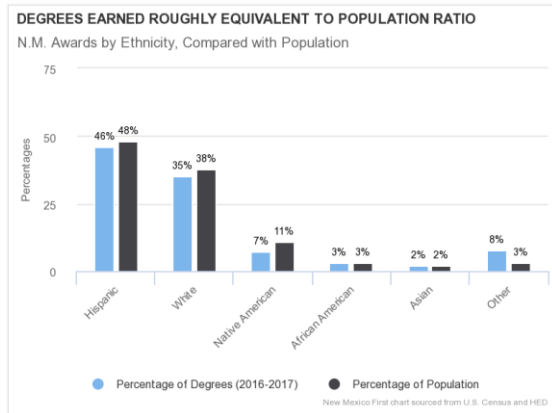


Figure 6: College completion rates by race/ethnicity, compared with demographic breakdowns, 2016-2017

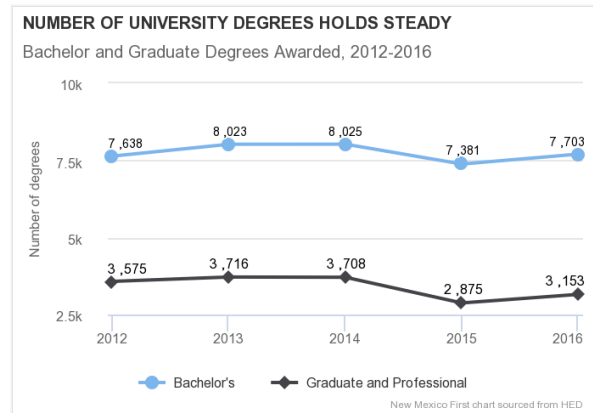


Figure 7: Number of university degrees awarded in New Mexico, 2012-2016

Given the culturally diverse nature of New Mexico's population, researchers also consider college graduation rates by race and ethnicity. Figure 6 illustrates that the percentage of New Mexico's completion rates (including certificates), roughly mirrors the racial/ethnic breakdowns of the state as a whole. For example, 48 percent of the state's population is Hispanic, compared with about 46 percent of total college completions. The largest gap between completions and the proportion of the population is New Mexico's Native Americans, with a difference of four percentage points. (See Appendix B for details on degree types by ethnicity.) National research points to the importance of continuing to provide tailored support to underserved populations in order to increase college completion. Georgetown data reveals that Latinos across the nation have increased their share of good jobs, but still benefit from solid college and career counseling.⁴⁸

GENDER GAP

Perhaps the most surprising achievement gap facing New Mexico and the nation is that many more women complete college than men. Three of every five New Mexico degrees or certificates go to women, compared with four of five nationally.⁴⁹ The disparity has been steadily growing for years. The pattern begins at enrollment, and extends across all types of degrees, as noted in Figure 8. Nationally, the My Brother's Keeper Alliance aims to address achievement gaps facing boys and young men of color. This report's previous chapter offered potential benefits of increased vocational training, which is one possible strategy for closing the college completion gap. Additional strategies include increased mentorship as well as strong counseling and support during the transition from high school to college for young men and boys.⁵⁰ The fact that boys sometimes have less developed social skills than their female peers can contribute to challenges adapting to college.⁵¹

Some suggest that demographic gaps in graduation rates may be better identified and addressed by simultaneously intersecting race, ethnicity, gender and class variables together.⁵² For example, using this multi-intersection process, it has been shown that, while more women are graduating than men, low-income Hispanic women are less likely to graduate than high-income White women.

⁴⁸ (Georgetown, 2014)

⁴⁹ (NCES)

⁵⁰ (My Brother's Keeper, 2017)

⁵¹ (Barron, 2016)

⁵² (Lopez, 2018)

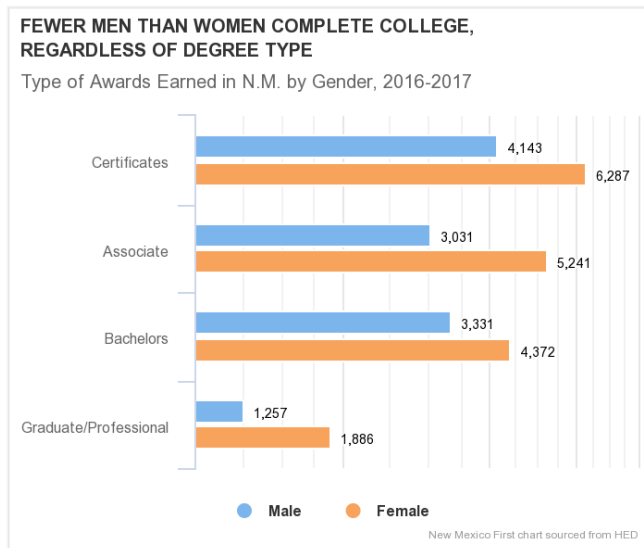


Figure 8: N.M. certificates and degrees, by award type and gender, 2016-2017

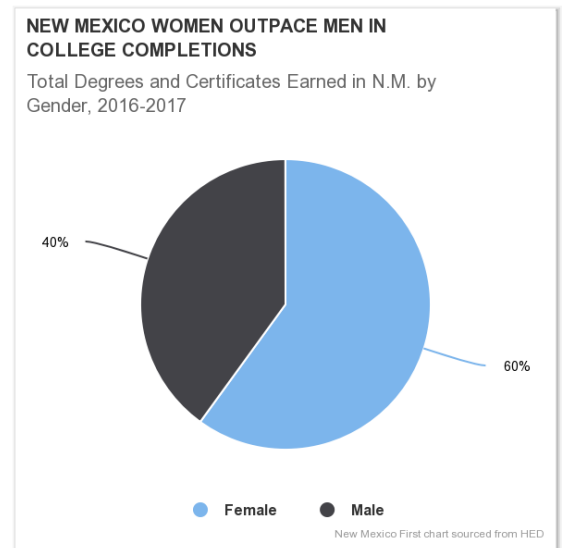


Figure 9: N.M. certificates and degrees, by gender, 2016-2017

Informed Decision-Making

In Chapter 1, this report addressed some of the information challenges students may face when deciding whether to pursue trade certifications, associate degrees or university degrees. For students who select the university track, equally challenging decisions arise about college majors. Employers sometimes worry about students' apparent lack of "career literacy" and limited knowledge of professional options including typical salaries for different fields. Students, particularly young women and men of color, might benefit from the following types of information:

- 1) Of the 10 college majors with the best starting salaries, nine are engineering degrees (i.e., mechanical, nuclear, computer, chemical engineering).⁵³
- 2) The top college majors that lead to personal satisfaction, measured by the percentage of graduates who find their work meaningful: nursing, special education, medical technology, engineering (biomedical and petroleum), athletic training, social work, child and family studies, dietetics, biblical studies/theology, public health, elementary education, health sciences and biology.⁵⁴
- 3) The most in-demand bachelor's degree occupations in New Mexico include registered nurses, K-12 teachers, health services fields, management and administration jobs, social workers, medical lab techs, computer and software development, financial and loan advisors.⁵⁵

The types of information above address earnings, quality of life and which types of jobs are in-demand. One of the largest national surveys of college consumers found that just over half would change at least one college decision: their major, their higher education institution, or their degree level.⁵⁶ These findings point to the value of career exploration before getting too far along in college. This matter is further addressed in Chapter 4.

Financing College to Support Completion

No matter what fields students find interesting, rising costs of higher education can make college seem impossible, especially for low-income students. In some cases, costs *are* the barrier; in other cases, families' lack of understanding of financial aid options makes the *perceptions* of costs the primary barrier. Low-income students may opt not to enroll in college because the perceived expenses are too high. Given that one in five New Mexicans

⁵³ (Somers, 2018)

⁵⁴ (Cutrone, 2012)

⁵⁵ (N.M. Department of Workforce Solutions, 2016)

⁵⁶ (Strata Education Network)

live in poverty, and even middle-income earners bring home less than the \$47,000, financing college is a major challenge for many families.⁵⁷

Meanwhile, state government support of New Mexico’s higher education system – like other states – diminished in the decade since the Great Recession. Per-student spending fell more than 30 percent during that period, and has not yet returned to pre-recession levels.⁵⁸ Despite these decreases, New Mexico continues to spend more on higher education, per capita, than most states.⁵⁹ Like much of the nation, New Mexico’s tuition rates continue to rise, increasing for universities by 35 percent since 2010.⁶⁰ (See Appendix C for historical tuition data in New Mexico.)

Nationally, tuition costs have increased at a far larger rate than other family expenses, illustrated in Figure 10. Federal Pell Grants subsidize college for students with financial need. The maximum award amount changes yearly, and in the 2015-2016 academic year was \$5,775. Students may qualify if their total family income is \$50,000 a year or less – as is the case with most New Mexicans. Most Pell Grant money goes to students with a total family income below \$20,000.⁶¹ The portion of tuition covered by the Pell Grant has not kept pace with rising tuition costs, however. It currently pays the lowest proportion in history and less than half of what it covered in 1980.⁶² (See page 20 in Chapter 3 for more information on financial aid.)

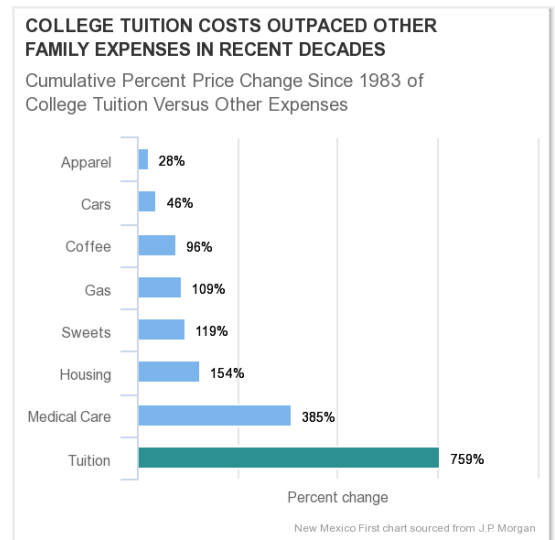


Figure 10: Percent change in tuition compared with other family expenses

COMPLICATIONS OF FINANCIAL AID SYSTEMS

Regardless what portion it covers, Pell Grants and other forms of financial aid play an important role in helping students and families pay for college. More than eight in 10 college students nationally receive at least some financial aid.⁶³ Undocumented students are not eligible for federal financial aid but may apply for state-funded student financial aid in our state.⁶⁴ Navigating the financial aid process presents significant challenges for all families, regardless their income level. One recent report, issued by the Jack Kent Cook Foundation, offers very concrete recommendations to academic institutions:⁶⁵

- 1) **Clarify financial aid letters**, which often lump together scholarship and loan information in confusing ways. The format varies considerably between institutions, creating difficulty for families trying to compare offers between schools. The U.S. Department of Education developed a standard “Financial Aid Shopping Sheet” and asked colleges and universities to adopt it for their financial aid letters. Over 3,000 institutions have obliged.
- 2) Provide families a **four-year cost estimate**, to support financial planning and encourage students to complete their degrees on time.
- 3) Establish **clear policies about financial aid requirements**, including what actions (i.e., bad grades or missed deadlines) might cause a student to lose their aid. Issue reminders about key dates.
- 4) **Maintain grant or scholarship levels** for the duration of students’ academic program. Some colleges offer enticement scholarships to get students to enroll, but those awards only last a year. Or others do not extend for the entire four years.
- 5) Educate faculty about **low-cost textbooks**, including open-license materials. Assign a committee to coordinate activities to reduce textbook costs. The average cost of textbooks rose 73 percent in the last decade.

⁵⁷ (Census ACS, 2016)

⁵⁸ (Mitchell, 2017)

⁵⁹ (State Higher Education Executive Officers Association, 2015)

⁶⁰ (College Board, 2017)

⁶¹ (Scholarships.com)

⁶² (Reich, 2015)

⁶³ (NCES, 2015)

⁶⁴ (National Conference of State Legislatures, 2015; U.S. Department of Education, n.d.)

⁶⁵ (Jack Kent Cooke Foundation, 2017)

- 6) Create **emergency aid programs**, such as campus food vouchers, short-term loans, food pantries or completion scholarships to help students get through difficult times. One study of California students found that about a fourth had to choose between buying food or paying for education and housing costs.
- 7) Make available **information on social services** such as Supplemental Nutrition Assistance Program (SNAP), previously known as food stamps, or the Earned Income Tax Credit (EITC). Such information can be particularly helpful to students whose financial aid forms indicate “no expected family contribution” to tuition costs.

The nonprofit New Mexico Voices for Children also advocates tapping social programs to make college more affordable for low-income families. For example, the federally funded Temporary Assistance to Needy Families (TANF) block grant aims to help low-income parents and pregnant women achieve economic self-sufficiency. Funds may be used to pay for vocational training, college tuition and child care assistance.

LOTTERY SCHOLARSHIP

New Mexico community college and university students benefit from a unique program. The Lottery Scholarship generally applies to New Mexico high school graduates who enroll full-time at an in-state college or university within 16 months of graduation and maintain at least a 2.5 grade point average.⁶⁶ The funds apply to tuition only, not textbooks or living expenses. Under a new law passed earlier this year, the award amounts are determined annually based, in part, on lottery earnings. Target amounts include: \$1,500 per semester for students enrolled at research universities; \$1,020 per semester for student enrolled at comprehensive universities; and \$380 per semester for student enrolled in community college.⁶⁷ The Lottery Scholarship may not be used at tribal colleges. Since its establishment in 1996, over 116,000 students have received the Lottery Scholarship.⁶⁸ However, critics note that the program is merit-based rather than need-based, and it leaves out adults who wish to return to college after entering the workforce.⁶⁹

COLLEGE AFFORDABILITY FUND

In part to address the concerns above, the New Mexico Legislature established the College Affordability Fund in 2005. It provides support, currently up to \$1,000 per semester, for students of any age who lack other financial resources and do not meet the age or academic requirements of the Lottery Scholarship. Students must be New Mexico residents and enroll at least half-time as undergraduates at a public college, university or tribal college located in the state.⁷⁰ The program has served 3,000-5,000 people per year and has provided roughly 50,000 scholarships over the existence of the fund.⁷¹

However, without legislative intervention, FY18 will be the last year students may apply for these dollars. When the fund was established, the intention was to appropriate \$2 million a year until enough dollars accrued to support an endowment fund to finance the annual scholarships. However, budget shortfalls prompted the Legislature to repeatedly deplete the fund to cover other state expenses. Lawmakers did not approve a new appropriation for the fund during the last legislative session, so the final \$1.5 million will be spent on scholarships this year.

MONEY MANAGEMENT AND STUDENT DEBT

Money management can present major challenges for college students, who are juggling major expenses (tuition, textbooks, living expenses) while not earning much income. It is easy to rack up both credit card debt and student loan debt during this time. Student loans can provide essential resources to make college possible, but some students are unable to pay them back – in many cases because they did not finish college and, thus, are not earning high enough salaries to repay their debts. New Mexico students actually leave college with lower-than-

⁶⁶ (HED)

⁶⁷ (New Mexico Legislature, SB 140, 2018)

⁶⁸ (New Mexico Lottery)

⁶⁹ (New Mexico Voices for Children, 2015)

⁷⁰ (HED)

⁷¹ (Rommel, 2018)

average debt burdens (about \$19,000 on average, compared with about \$29,000 nationally).⁷² However, we have the worst student loan default rate in the country, at 19 percent.⁷³

The majority of public and private loans go to students in bachelor's, graduate and professional degree programs. (Most community college students do not "over-borrow" and many do not take out loans at all.⁷⁴) Strategies to reduce default can be directed to schools and students directly, or to state and federal policymakers.

Recommendations for students and graduates (which could be facilitated by their colleges) include:⁷⁵

1. Taking a money management course (such as NMSU's "Red to Green" program that teaches about budgets, credit scores and loan debt)
2. Making more than the minimum payment
3. Knowing the pay-off date and working to move it closer (many students have no idea the pay-off date and how much interest accrues if they use the maximum time to repay their loan)
4. Consolidating or refinancing student loans
5. Making a lump-sum payment when the borrower comes into extra money
6. Taking a job that makes the borrower eligible for loan forgiveness
7. Using any raises to increase student loan payments
8. Cutting personal spending and increasing loan payments
9. Working a side job and using the extra income to repay loans

Recommendations for lenders include:⁷⁶

10. Making the 56 different repayment options and programs easier to understand and less cumbersome
11. Stopping promotion of refinance options with lower payments over longer periods; these programs should not be the default option for most graduates since they extend both the loan period and the long-term interest
12. Encouraging borrowers to communicate with their lender if they are having trouble, rather than just default

Broader policy recommendations offered by the Institute for College Access and Success include:⁷⁷

13. Increasing access to need-based student aid (Pell Grants, financial aid process, higher education tax benefits)
14. Simplifying federal student loans and better target subsidies
15. Collecting better data on student debt and outcomes
16. Protecting students and taxpayers from colleges that overcharge and underdeliver
17. Strengthening policies to prevent waste, fraud and abuse

The ideas above apply primarily to federal loans. A small amount of student loans in New Mexico – just 1 percent – come from the state. These "loan for service" programs support in-demand careers like teachers, healthcare professionals or social workers. The default rate for these programs is very low. These loans totaled \$2.9 million and supported 245 students in 2017.⁷⁸

Strategies for University Success

University students succeed in school when they are well equipped before they arrive, so all the high school preparedness strategies presented in Chapter 1 (i.e., dual credit, career pathways, Next Step Plans) apply here. Once students get to college, research points to several high-impact learning strategies that lead to success for all students, and especially for underserved populations. The following activities, all of which already take place to some degree in New Mexico, can be advanced by colleges and universities and often rely on appropriations from state legislatures. Proven strategies include:⁷⁹

⁷² (TICAS, 2015)

⁷³ (Student Loan Report, 2017)

⁷⁴ (TICAS, 2014)

⁷⁵ (Trull, 2018); (NMSU)

⁷⁶ (Remondi, 2016)

⁷⁷ (TICAS)

⁷⁸ (HED, 2017)

⁷⁹ (LEAP, 2013)

1. **First-year experiences**, including seminars or freshmen programs, bring students together with faculty regularly. Mandatory office hours with one faculty member can also support strong transitions to college.
2. **Learning communities** encourage integration of ideas across courses, connecting students with peers and making coursework relevant.
3. **Writing-intensive courses** are essential at all levels of instruction, including writing for different audiences.
4. **Collaborative assignments and projects** help students learn to work and solve problems with others, while also sharpening their ability to honestly consider other perspectives.
5. **Undergraduate research** is not just for science majors anymore; students from all disciplines benefit from this proven critical learning activity.
6. **Diversity and global learning** includes courses and programs that help students explore cultures and worldviews different than their own.
7. **ePortfolios** enable students to collect work over time, reflect on their growth, and then share selected items electronically with faculty or future employers.
8. **Service learning** experiences provide important opportunities for project-based experiential learning, and are particularly effective with they combine real-world setting with classroom reflection.
9. **Internships** provide another form of experiential learning and tie directly to career goals.
10. **Capstone courses and projects** are culminating experiences that require students nearing the end of college to create a project that integrates or applies what they learned across their degree program.

The point of listing these items is not to imply that New Mexico colleges do not offer these experiences. They do. However, in many cases, these opportunities go to higher achievers and the students who know to seek them out. They are not necessarily deployed in a systematic way, and often are not specifically targeted to the underserved populations – including first generation and nontraditional students – who could most benefit from these high-impact learning strategies.

ONLINE COURSES

With ever-tightening budget concerns, talk often turns to online courses as a lower cost solution for delivering instruction. The strategy applies to both community college and university students. These types of classes work well for some students, less so for others. For some students, a mix of online and in-person classes can offer flexibility and increase the likelihood of finishing a degree or certificate on time. However, given that “soft skills” (i.e., collaboration, communication) are so essential to success in the workplace, it is likely that in-person coursework will remain important.

When considering the needs of underserved populations in particular, there are both benefits and drawbacks of online models.⁸⁰ On the plus side, the individualized learning and flexible schedules of online courses can be helpful to students who are also juggling jobs and family obligations. Conversely, those very obligations can make it more difficult for online learners to maintain the strong personal discipline required for the online work. Additionally, online students do not get the one-on-one interaction with peers and professors that they would in a traditional classroom. In-person interaction can improve student performance by making it easier to identify then redirect a struggling student. Recent national research with a sample of 2,600 online learners indicated that non-native English speakers were more likely than native English-speakers to choose online classes for educational advancement. However, they were not more likely to complete them. Older, unemployed, white males were the most likely of any population to complete online courses.⁸¹

⁸⁰ (Chen, 2018)

⁸¹ (Stich, 2017)

Teacher Colleges

Aside from continuing to strengthen higher education in general, New Mexico relies on our colleges and universities to prepare the next generation of qualified teachers. This college major is a key driver of our economic and educational success, and practically all the high school preparedness strategies described in Chapter 1 rely on effective teachers. To develop educators with the attributes of excellence, teacher preparation programs at colleges and universities must provide strong pedagogical training, effective student teaching experiences, as well as collection of data about teacher retention and teachers' impact on student achievement.⁸² Additionally, we must keep them in the profession. Across the country, almost half leave the field in their first five years.⁸³

In New Mexico, the most recent data available (2017) indicates 673 education vacancies, the clear majority for teachers (as opposed to administrators, counselors or ancillary positions).⁸⁴ This number represents a 13 percent increase over 2016. Geographically, most of the vacancies were for schools in central and northwest New Mexico. In terms of discipline, most were for elementary and special education.

New Mexico is home to six universities with Teacher Education Programs (TEPs), including traditional undergraduate programs, graduate certification programs, and alternative licensure programs. In addition, several two-year institutions offer alternative licensure programs to individuals who already have a bachelor's degree. Completion rates for teacher programs at all the four-year institutions decreased considerably over the last six years, except at ENMU, where the number of graduates increased by 17 students in 2014-2015. Overall however, the trend is troubling. In 2009-2010, New Mexico schools graduated 1,073 teachers; in 2014-2015, the figure was 775, representing a 28 percent decrease.⁸⁵

In addition to preparing the data above, the New Mexico Educator Vacancy Report also offered concrete recommendations for strengthening the teacher pool:

1. Develop a comprehensive report to provide a clear picture of the supply and demand of education careers through 2030.
2. Design a longitudinal study to determine the impact of "Educators Rising" programs established in New Mexico. (Educators Rising – formerly "Future Educators Association" – is a high school career and technical organization organized by New Mexico State University. Its clubs and career pathways programs can be found in high schools across New Mexico but it is not officially statewide.)
3. Research the potential impact of incentive programs (e.g. loan forgiveness and scholarships) to attract and retain students to become highly qualified teachers in New Mexico, especially in high need areas.
4. Develop and support programs for current educational assistants so that they may receive the proper training and certification necessary to become teachers, especially in special education.
5. Support the "Grow Your Own Teachers" movements in New Mexico, like Educators Rising, at the state level by offering sustainable financial support for existing teachers to cultivate a new generation of teachers beginning with middle and high school students including students enrolled in the Career Technical Education Pathway for future educators.

New Mexico's Legislative Education Study Committee (LESC) also prioritizes the issue of teacher preparation. In its most recent annual report, the LESC makes it clear that effective teacher preparation is the cornerstone of the education system.⁸⁶ The report spotlights global research of high-performing countries in which teacher candidates are rigorously trained, similar to the way doctors are in the United States.⁸⁷ In addition, these countries use research-based systems that focus on the learning and development of the whole child. Teacher candidates are expected to publish in clinical journals, and senior teachers perform in-class coaching for beginning teachers, a process that usually spans two years and can last four years in some countries. Consideration of these types of ideas may help New Mexico and other states prepare the next generation of committed, high-quality teachers.

⁸² (President's Council of Advisors on Science and Technology, 2010)

⁸³ (NEA)

⁸⁴ (NM Educator Vacancy Report, 2017)

⁸⁵ (NM Educator Vacancy Report, 2017)

⁸⁶ (LESC Annual Report, 2018)

⁸⁷ (National Conference of State Legislatures, 2016)

A Note on Jargon

To the many educators and government authors who read this report, we offer a word of advocacy, urging you beware of jargon. It can present a considerable barrier to those aspiring to higher education – at the community college or university level. In preparing this report, the writing team encountered dozens of websites and brochures intended for high school and college students. They aimed to provide guidance for college and career but were full of technical jargon that many people could not reasonably be expected to understand. Terms like postsecondary, paraprofessional, budget controls, award amounts, or FSA ID are rarely used in common speech.⁸⁸ (See Appendix G for good and bad examples of written communication on health careers.) Another glaring sample appears on the website for the federal TEACH grants. The page, intended to overview the program for new applicants, instead opens with the following 87-word run-on sentence:⁸⁹

As required by the Budget Control Act of 2011 (the sequester law), any TEACH Grant that is first disbursed on or after Oct. 1, 2016, and before Oct. 1, 2017, must be reduced by 6.9 percent from the award amount for which a recipient would otherwise have been eligible; and any TEACH Grant that is first disbursed on or after Oct. 1, 2017, and before Oct. 1, 2018, must be reduced by 6.6 percent from the award amount for which a recipient would otherwise have been eligible.

We rest our case on jargon.

Student Case Study: Success in Joint Bachelor's/Master's Program

ALLIE ARNING: NEW MEXICO TECH, SENIOR IN ENVIRONMENTAL ENGINEERING



As a high school student, Allie Arning wanted to pursue a career in environmental sustainability but was concerned that her math skills were not strong enough to succeed in STEM classes. Allie took the initiative and sought math tutoring and enrolled in summer school. The added support and guidance through tutoring and summer school gave her the opportunity to catch-up and prove to herself that her career goals were not out of reach.

Allie is now a senior at New Mexico Tech, poised to graduate from a 5-year combination Bachelor of Science and master's in environmental engineering. She especially enjoys hands-on time in the lab, as well as learning from faculty who are enthusiastic about the subject matter they are teaching. While Allie benefitted from her family's emotional support and on-campus resources, she ultimately credits much of her academic success to receiving tutoring early in college that gave her the confidence to stay the course in STEM. For students who doubt their ability she encourages them to speak up! "As soon as you have a question, ask it. As soon as you need help, pursue it."

Intersections and Conclusion

Fundamentally, this chapter offers reasons to be optimistic about New Mexico's future, as well as challenges to overcome. Supporting students from all walks of life to succeed in college remains a top priority across the state. That success can include informed decision-making by students and their families, clear and navigable information on financial aid and loans, as well as compelling and well-delivered coursework. Statewide, our future also relies on a well-prepared core of effective K-12 teachers, many of whom are educated in our state's universities. Much of the content in this chapter applies equally to university and community college students, so it connects with important ideas in Chapter 1. Additionally, individual student finances are closely tied to state funding decisions, presented in Chapter 3. Community members, educators, students, policymakers and others can all consider ways to strengthen these activities, pointing the way to smart higher education reforms.

⁸⁸ Note: The writers intentionally did not define FSA ID in the paragraph above to give readers a glimpse into students' perspective. We found the acronym in multiple locations without definition. Even the federal page titled "What is a FSA ID?" does not say what it stands for. The answer: Financial Student Aid Identification Number.

⁸⁹ (U.S. Department of Education)

Chapter 3

Higher Education System

Leadership, Governance and Finance

New Mexico’s higher education system is at a crossroads. Our state has a vast higher education system meant to match the state’s large geographic footprint and meet community needs for access to higher education. We believe in the importance of higher education and have stood by that belief by investing heavily in the system, and in our students. And yet, New Mexico remains one of the poorest states, with postsecondary graduation rates lower than the national average, and promising students leaving the state for better educational and economic opportunities. The system remains reliant on diminishing federal and state funds. Some higher education institutions need additional oversight and guidance to improve fiscal and administrative management as well student outcomes. **This chapter provides key information about our higher education system and options for strengthening it through innovative leadership, accountable governance and diversified financing.**

KEY CONSIDERATIONS

Many of us have an allegiance to our state colleges and universities as a student or educator, a sports fan or hometown community member. However, few of us know how these institutional pillars of our communities are structured, governed or financed, and how the schools respond to the needs of students, the community or the state. What can be done to simultaneously improve both institution efficiency despite diminishing revenues and student success and outcomes?

Higher Education System

New Mexico is home to 29 public higher education institutions (HEIs) located throughout the state serving approximately 133,830 students. These schools are economic drivers and hubs of civic and community pride. New Mexico’s institutions fall into six categories, four of which are state-funded institutions:⁹⁰

- Research universities
- Comprehensive universities (serving more regional needs)
- Branch community colleges associated with four-year institutions that award two-year degrees and certificates
- Independent community colleges that award two-year degrees and certificates
- Federally funded tribal institutions
- Private, nonprofit institutions (e.g. St. John’s College, University of the Southwest)
- Private, for-profit institutions (e.g. University of Phoenix)

In addition, many institutions provide instruction and degree programs at satellite locations. Collectively, this

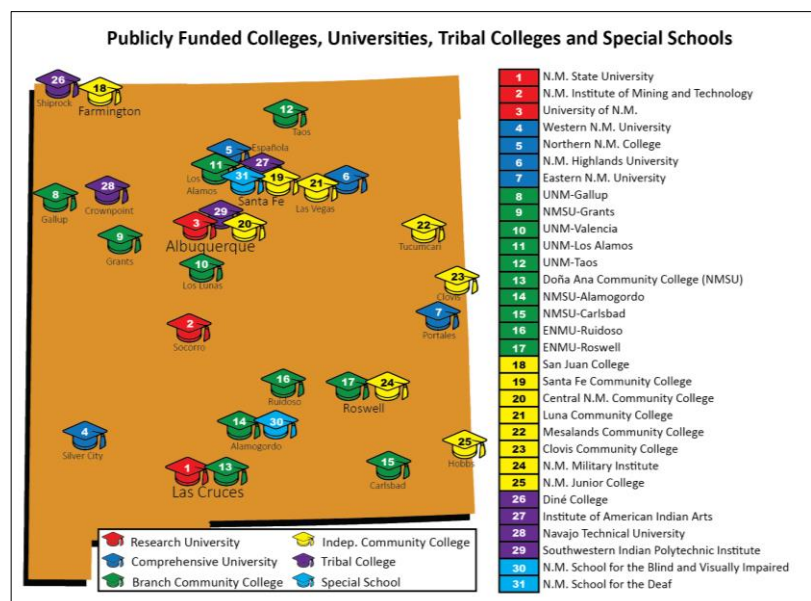


Figure 11: Map of Public Colleges and Universities in New Mexico

combination of institutions means that New Mexico residents have 77 physical points of access from which they can tap higher education. This level is reflective of New Mexico being the fifth-largest state in the nation with large distances to travel between communities. Some institutions also offer online certificate and degree programs, some of which are offered outside an institution's taxing district and across the United States.⁹¹

Like most states, New Mexico experienced the largest increase in HEIs post-World War II. Between 1956 and 1968, New Mexico established 11 community colleges and 14 branch community colleges.⁹² In 1998, the Legislature became concerned with continued higher education expansion and placed a limit on community college, branch campus and off-campus instructional center growth by requiring legislative approval of any new sites. Two years later, the state enacted a separate law to allow learning centers to be established. Learning centers are not stand-alone institutions, rather they are collaborative efforts by multiple institutions to offer particular programs at one location, either with live instruction or online, allowing students from different schools to participate without travelling to a main campus location.⁹³

The New Mexico Higher Education Department (HED) provides statewide policy direction, leadership and oversight to New Mexico colleges and universities in many areas including budget review and approval, review of select academic programs and administration of state financial aid programs.⁹⁴ Increasing the number of schools, access points and online offerings helped shrink travel times and increase feasible access to higher education for New Mexicans. Some states like Arizona offer more points of access, but fewer systems.

In 2017, the HED convened a Statewide Higher Education Master-plan committee (NM SHEM) composed of key stakeholders and leaders from higher education, public education, business and the executive and legislative branches of state government to develop a strategic plan for higher education in New Mexico.⁹⁵ Finding that the number of schools in a state does not determine quality, the HED does not recommend that any New Mexico campuses close. Instead, it suggests exploring efficiencies such as coordinating human resources, streamlining backend administrative services, and taking a closer look at the pros and cons of more online coursework.⁹⁶ The Education Advisory Board developed a shared services model to help guide colleges in this area.⁹⁷

Higher Education Governing Authority

The state constitution authorizes the establishment of seven HEIs. Each of these schools is governed by a board of regents consisting of five members except for UNM, which has seven. Regents are appointed by the governor and subject to confirmation by the state Senate.⁹⁸ *See Appendix A for a table of universities established by the state constitutions.*

Community colleges are another type of HEI. Community support is key in establishing and governing branch and independent community colleges. Existing state law authorizes 10 branch colleges. Communities must request the establishment of a branch college. An advisory board oversees each branch and is composed of either local school board members or a five-member elected branch campus board. The advisory board develops the annual budget and certifies voter-approved tax levies supporting the branch. Oversight, approval and ultimate responsibility for academic programs, tuition rates and budgets rest with the main campus' board of regents. Of note, some four-year institutions also offer associate programs. *See Appendix A for a table of branch community colleges.*

Existing state law also authorizes seven independent community colleges, which are also home to technical and vocational programs. Each community college is in an area composed of one or more public school districts. Voters elect the community college board members, who must be at least 21-years-old, qualified electors and residents of the local school districts. Community college boards determine financial, educational and management policies. *See Appendix A for a table of independent community colleges.*

⁹¹ (Hartzler, 2018)

⁹² (N.M. Legislative Finance Committee, 2017)

⁹³ (N.M. Higher Education Department, 2017)

⁹⁴ (N.M. Higher Education Department, 2017)

⁹⁵ (N.M. Higher Education Department, New Mexico Higher Education Governance Structure: Study and Recommendations Report, 2017)

⁹⁶ (N.M. Higher Education Department, 2018)

⁹⁷ (Education Advisory Board, 2016)

⁹⁸ (N.M. Legislative Finance Committee, 2017)

Higher Education System and Institution Challenges

New Mexico’s HEI’s, like institutions across the nation, face many challenges. To move confidently into the future, schools must closely examine how they are financed, organized and measured.

FINANCIAL HEALTH

New Mexico has long prioritized higher education as important to the state, with 13 percent of the state budget devoted to it.⁹⁹ Including recent state cuts to higher education, the state remains in the top ten states that spend the most per student on higher education, allocating an average of \$8,799 per full-time student.¹⁰⁰ Despite this substantial investment, many are troubled about why New Mexico remains the poorest state in the nation.¹⁰¹

State coffers are not the only funding source for New Mexico higher education institutions; they derive revenues from tuition as well as federal and local government. Combined, these revenues totaled \$2.7 billion in fiscal year 2016.¹⁰² Much of this funding is allocated to academic instruction and support, student services, administration, operations and maintenance (called out in red circles below).

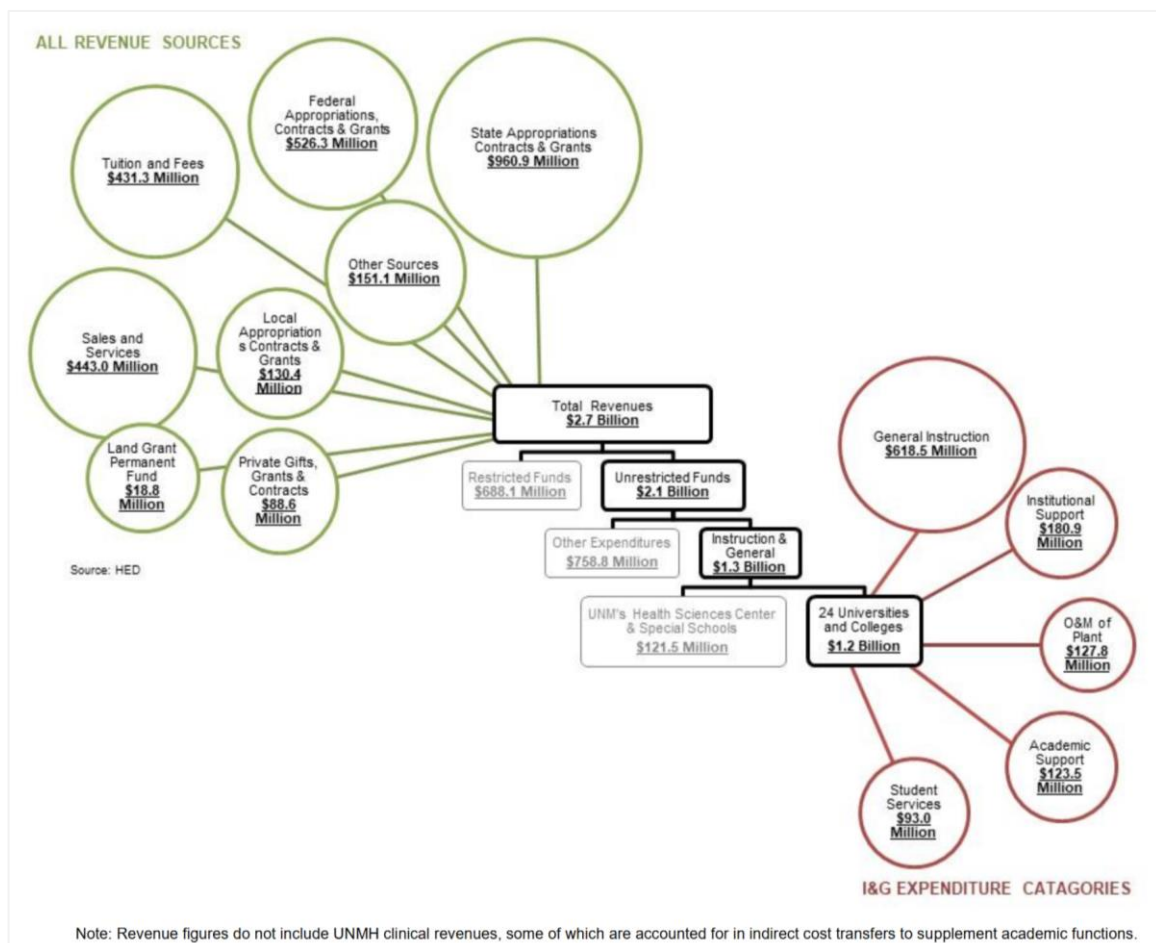


Figure 12: New Mexico HEI Revenue and Expenses Overview

⁹⁹ (Albuquerque Journal, Higher Education Town Hall, 2017)

¹⁰⁰ (Galvin, 2017; Courtney, 2018)

¹⁰¹ (N.M. Legislative Finance Committee, 2017)

¹⁰² (N.M. Legislative Finance Committee, 2017)

State funds comprise over half of revenues at most New Mexico institutions with the exception of independent community colleges that rely heavily on local appropriations.¹⁰³ Most unrestricted revenues come from state appropriations and are for instruction and general purposes (I&G) with the UNM Health Sciences Center receiving over \$121 million of I&G funds. Categories of I&G expenditures include general instruction, academic support, student services, institutional support and operation and maintenance. The chart below provides examples of I&G related expenditures. Of note, information technology is a significant expense allocated across all I&G categories.

TABLE: EXAMPLES OF I&G EXPENSES

General Instruction \$618.5 Million	Academic Support \$123.5 Million	Student Services \$93.0 Million	Institutional Support \$180.9 Million	Plant Operation & Maintenance \$127.8 Million
<ul style="list-style-type: none"> ▪ Academic instruction ▪ Occupational and vocational instruction ▪ Special session instruction ▪ Community education 	<ul style="list-style-type: none"> ▪ Libraries ▪ Museums ▪ Audio-visual services ▪ Academic administration and personnel ▪ Course and curriculum development 	<ul style="list-style-type: none"> ▪ Supplementary educational services ▪ Counseling and career guidance ▪ Financial aid administration ▪ Student admissions and records 	<ul style="list-style-type: none"> ▪ Executive management ▪ Fiscal operations ▪ General administrative services ▪ Community relations 	<ul style="list-style-type: none"> ▪ Physical plant administration ▪ Building maintenance ▪ Custodial service ▪ Utilities ▪ Landscaping and grounds care

With an eye toward a rational method for distributing state funds to New Mexico’s public colleges and universities for I&G, the state uses a funding formula each year to calculate how much each institution should receive. Between the late 1980s and FY12, this formula focused on partially reimbursing the costs of educating students, including instruction, academic support, student services, facilities, and institutional support.¹⁰⁴ Beginning in FY12, the formula was adjusted to also consider institutions’ performance, such as the total number of students graduating from certain certificate and all degree programs. Nationally, 32 use higher education funding formulas that reward colleges and universities for performance outcomes.¹⁰⁵ According to HED, there appears to be a correlation between New Mexico’s modest amount of performance-based formula and increased certificate and degree production statewide. Between FY11 and FY16, the number of New Mexico credential completions in FY16 (22,885) was almost 20 percent higher than in FY11; graduation rates increased 23 percent.

Some argue that adjusting the capital outlay process and the higher education funding formula would help institutions right-size to better meet the needs of today’s and future students. For example, the capital outlay budget process allows funding for constructing buildings, but not for improving existing infrastructure such as increasing broadband or online access in existing structures.¹⁰⁶

FINANCIAL AID

New Mexico schools are also heavily dependent on federal funding in the form of student financial aid and research dollars through Title IV of the federal Higher Education Act. New Mexico receives direct federal funds through research contracts and grants and indirect federal funding from students receiving federal grants and aid. New Mexico receives more money than the national average due to the state’s financial need and the presence of higher education research focused schools.¹⁰⁷ The Federal Pell Grant program, distributed on a needs basis to

¹⁰³ (N.M. Legislative Finance Committee, 2017)
¹⁰⁴ (N.M. Higher Education Department, Funding Formula Guide, 2017)
¹⁰⁵ (N.M. Higher Education Department, Funding Formula Guide, 2017)
¹⁰⁶ (Albuquerque Journal, Higher Education Town Hall, 2017)
¹⁰⁷ (The Pew Charitable Trusts, 2015)

students whose families earn less than \$60,000 a year, remains the primary source of federal grant aid for over 46,000 New Mexico students with funding totaling \$161 million.¹⁰⁸

Unfortunately, all revenue streams are either diminishing or remain uncertain. Since the 2008 recession, New Mexico has struggled to maintain state funding levels. Declining state oil and gas revenues earlier in the decade contributed to a 33 percent cut to higher education, equal to a \$4,509 reduction in per student spending.¹⁰⁹

Nationwide, funding for major federal higher education programs grew significantly since the onset of the recession, making up somewhat for state shortfalls.¹¹⁰ However, the purchasing power of federal aid, particularly for the Pell Grant program, has waned in the face of rising college costs.¹¹¹ It remains uncertain whether Congress will choose to hold federal financial aid steady, increase it to account for inflation, or reduce the programs.

Enrollment plays a considerable role in how schools support themselves. New Mexico enrollments are down from 155,065 in 2010 to 133,830 in 2016.¹¹² Reasons for enrollment declines include: “brain drain” (i.e., young and working age New Mexicans seeking education and work elsewhere); an improving economy driving people back into the workforce; and increased tuition and student costs.¹¹³ A drop in enrollment means less tuition revenue. It also results in decreased appropriations institutions receive for degrees awarded and student credit hours completed. These changes can prompt schools to adjust staffing, infrastructure and budgets.¹¹⁴

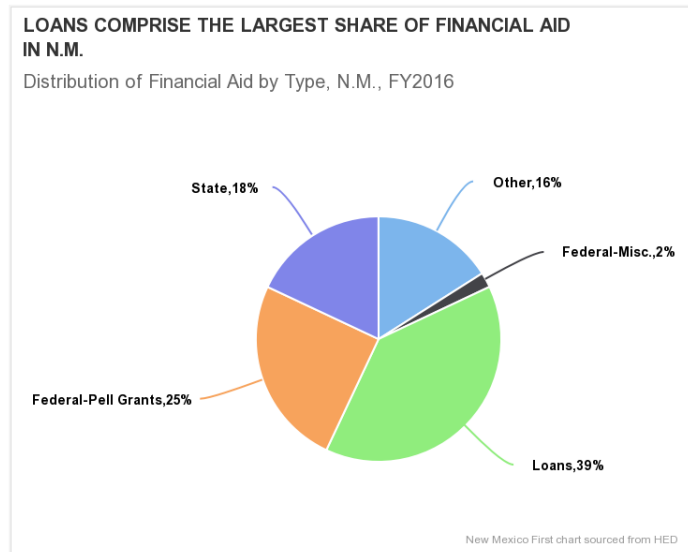


Figure 13: Types and percentages of financial aid received by N.M. students, FY2016

The state Lottery Scholarship is one of the most well-known forms of state financial aid. Higher education leaders are concerned that the recent drop from 90 to 60 percent coverage of tuition costs through the Lottery Scholarship will cause further enrollment declines. In FY17, Lottery Scholarship tuition payments totaled \$58.1 million, providing scholarships for 29,143 students that covered 90 percent of tuition costs.¹¹⁵ Recently signed into law during the 2018 state legislative session was the bipartisan supported SB 140/HB 270 that revised the Lottery Scholarship program by designating a fixed funding amount depending on whether a student is attending a community college or four-year institution.

Another state scholarship program, the College Affordability Fund, provides support for students who do not qualify for the lottery. However, without intervention, that fund will be completely depleted this year. *See Chapter 2, page 12, for additional information.*

¹⁰⁸ (N.M. Higher Education Department, 2017)

¹⁰⁹ (Nott, 2017; Center on Budget and Policy Priorities, 2017)

¹¹⁰ (The Pew Charitable Trusts, 2015)

¹¹¹ (Douglas, 2017)

¹¹² (Albuquerque Journal Editorial Board, 2017)

¹¹³ (Marcus, 2017; Strayer, 2016)

¹¹⁴ (N.M. Legislative Finance Committee, 2017)

¹¹⁵ (N.M. Higher Education Department, 2017)

GOVERNANCE STRUCTURE

New Mexico's decentralized system of higher education governance provides both benefits and disadvantages. Decentralized governance maximizes institutional flexibility and responsiveness in meeting community needs, selecting leadership, fostering educator professional autonomy, developing and amending budgets, and altering academic programming.¹¹⁶ The boards are also a source for local pride and autonomy.

On the other hand, some argue that the current system lacks adequate oversight and accountability to the detriment of taxpayers and students. For example, according to the Legislative Finance Committee (LFC), some institutions have allowed unsustainable operational spending and institutional fund balances, embezzlement, mismanaging funds, and mismanagement of capital outlay projects.¹¹⁷ In addition, the current governance structure does not inherently reward collaboration among the schools, a practice that could contribute to less duplication, increased efficiencies and better student outcomes. The LFC also asserts that some schools are proactively improving efficiencies while others struggle financially.

Given the number of institutions, boards of regents and advisory boards, the overall cost of New Mexico's system, and concerns about effective oversight and duplication, many have asked whether the state should consider a more centralized higher education system. The HED looked closely at this question. In 2017, the department garnered feedback from over 100 higher education stakeholders, established the NM SHEM Committee, and studied the examples of the governing structures for all 50 states.¹¹⁸ Based on this research, New Mexico the committee recommended that no changes be made to the fundamental governance structure. It recommended that the state create a New Mexico Higher Education Council. The council would include representatives of state college and university associations, as well as the cabinet secretaries for the economic development, workforce development, and finance and administration departments.¹¹⁹

Building on the research above, the HED and LFC determined that changing the governing structure would not inherently result in significant cost savings, efficiencies or better student outcomes.¹²⁰ However, if the state keeps its decentralized system of 21 governing boards and 10 advisory boards, wrote the HED in its 2017 annual report, further work must be done to increase efficiencies and improve student outcomes.¹²¹

Measuring Higher Education Institution Performance

Higher education institution performance is measured by federal, state, regional and program-specific accrediting bodies that apply various metrics to evaluate school performance and student success. Entities that oversee and measure institution performance include boards of regents and advisory boards, the HED, the state Legislature and the Higher Learning Commission (HLC). While New Mexico remains a low-cost state overall, studies have shown that many of our institutions lag behind peers on outcomes and efficient spending.¹²² Therefore many of the suggestions from national experts measure both cost, efficiency and student outcomes.

In addition, education leaders argue that institutional performance should take into account the population of students who arrive at their doors, unprepared for college, from poor households, with economic and social burdens much larger than HEIs alone can carry and resolve. No longer can schools expect that students are "college-ready." Instead, schools must be "student-ready" – ready to provide services and guidance beyond the classroom for students to succeed.¹²³

Regarding cost reduction, some people suggest that New Mexico increase the number of online or hybrid (partly online) courses. More students can take classes remotely, and online courses generally require fewer faculty. However, this solution is not likely to work in all cases. Not all students learn well online, and not all courses can be

¹¹⁶ (N.M. Legislative Finance Committee, 2017)

¹¹⁷ (N.M. Legislative Finance Committee, 2017)

¹¹⁸ (N.M. Higher Education Department, 2017)

¹¹⁹ (N.M. Higher Education Department, Governance Structure: Study and Recommendations, 2017)

¹²⁰ (N.M. Higher Education Department, 2017; N.M. Legislative Finance Committee, 2017)

¹²¹ (N.M. Higher Education Department, 2017)

¹²² (N.M. Legislative Finance Committee, 2017)

¹²³ (Albuquerque Journal, Higher Education Town Hall event, 2017)

developed well online (i.e., physical science lab courses). Additionally, online courses may be outside of the reach of some students in New Mexico who have limited access to computers or internet.¹²⁴

ACCREDITATION

Accreditation is not only important, but critical to student success and the continued existence of higher education institutions. Broadly speaking, accreditation is a mark of quality and signifies whether a school meets or exceeds minimum standards. It helps students identify acceptable institutions for enrollment, and employers know whether a graduate is qualified. The accreditation process involves school staff, faculty, students, graduates and advisory boards in institutional evaluation and planning. This continual process results in goals for institutional self-improvement and provides a self-regulatory alternative for state oversight functions. Students and graduates of accredited schools can rely on their coursework and degrees being accepted by other schools as well as by employers.¹²⁵ Accreditation also provides a basis for determining eligibility for federal student assistance. Only accredited schools can offer students federal financial aid.

The HLC is the regional accrediting body for New Mexico higher education institutions. The HLC accreditation criteria include the following:¹²⁶

- **Mission:** The institution's mission is clear and articulated publicly; it guides the institution's operations.
- **Integrity:** The institution acts with integrity; its conduct is ethical and responsible.
- **Quality, Resources, and Support:** The institution provides high quality education, wherever and however its offerings are delivered.
- **Evaluation and Improvement:** The institution demonstrates responsibility for the quality of its educational programs, learning environments, and support services, and it evaluates their effectiveness for student learning through processes designed to promote continuous improvement.
- **Resources, Planning, and Institutional Effectiveness:** The institution's resources, structures, and processes are sufficient to fulfill its mission, improve the quality of its educational offerings and respond to future challenges and opportunities; the institution plans for the future.

The HLC also uses a Composite Financial Index Score (CFI) to measure short- and long-term health of institutions. Funding decreases, short-term borrowing patterns, and economic downturns negatively affect CFI scores.¹²⁷

Fiscal operations of some schools are unfortunately placing regional and program accreditations at risk. More than half of New Mexico's higher education institutions are not meeting financial health benchmarks.¹²⁸ For example, Luna Community College (LCC) may lose its accreditation due to fiscal, administrative and governance mismanagement.¹²⁹ If it does lose accreditation, LCC students will have to persuade other schools to recognize their completed coursework. Dollars spent on their education could be lost and leave them without a degree.

Additionally, high student loan default rates are one of the determining financial health factors measured by accreditors. While New Mexico has made modest improvements in student loan default rates in recent years, New Mexico and West Virginia lead the nation in student loan default rates at over 18 percent while the national average is 11 percent.¹³⁰ Institutions with high student loan default rates of 30 percent or higher in three consecutive cohorts risk losing their accreditation.¹³¹

Increasingly, degree programs within higher education institutions such as nursing programs are also accredited by national accrediting bodies and may also be regulated by a state licensure board.

¹²⁴ (N.M. Legislative Finance Committee, 2017)

¹²⁵ (U.S. Department of Education, n.d.)

¹²⁶ (The Higher Learning Commission, n.d.)

¹²⁷ (N.M. Legislative Finance Committee, 2017)

¹²⁸ (N.M. Legislative Finance Committee, 2017)

¹²⁹ (Carillo, 2017)

¹³⁰ (NM in Focus, 2016; Student Loan Report, 2017)

¹³¹ (N.M. Legislative Finance Committee, 2017)

STATE PERFORMANCE MEASURES

To improve fiscal accountability and improved performance, the LFC has recommended that the Legislature consider using the Accountability in Government Act (AGA) measures along with a revised funding formula that provides meaningful rewards to high-performing, highly efficient institutions.¹³² One of the ACA measures for HED performance includes evaluating the department's strategic initiatives, such as on-time degree completion, postsecondary credential attainment and financial controls. The AGA also measures institutions. The HEI measures were recently revised, creating more comparability between New Mexico's colleges and universities.

State funding for HEIs is moving from an input-based model (how many students are enrolled) to an outcome-based model (i.e., are students graduating, is the institution graduating underserved and minority students, are the institutions graduating students with the skills to match workforce needs, is science being advanced).¹³³ In addition, HED now requires universities to report the four-year graduation rates for first-time freshman. Previously, six-year graduation rates were reported.

For the HED Adult Education program, the department has implemented core performance measures to help ensure meaningful student progress and guide program planning and curricula.¹³⁴ The program assists adults, including parents and English Learners, to become literate and obtain the knowledge and skills necessary for employment and economic self-sufficiency. New Mexico's eligible adults represent important human and economic potential when they are provided access to education and training. The performance measures include:

- Attaining a high school equivalency credential
- Obtaining and retaining employment
- Transitioning to postsecondary education

ADDITIONAL WAYS TO MEASURE PERFORMANCE

Increasingly, higher education leaders and policymakers seek additional ways to more comprehensively and accurately measure institutional performance. National organizations have suggested additional ways to better measure higher education institution performance. For example, the National Academies of Sciences, Engineering and Medicine proposed the following measures:¹³⁵

- Completion and enrollment ratios
- Time to degree
- Costs per credit or degree
- Student-faculty ratios

The National Conference of State Legislatures (NCSL), which promotes policy innovation and effectiveness of state legislatures, suggested the following performance measures on certificates and degrees:¹³⁶

- The number awarded in state workforce priority areas
- The number earned by financially at-risk students

Multiple other organizations have also given thought to evaluating higher education; additional ideas not reflected above include:¹³⁷

- Course completion rates
- Tracking student attainment of educational goals
- Number of graduates with jobs in their area of study
- Median wages of graduates

¹³² (N.M. Legislative Finance Committee, 2017)

¹³³ (N.M. Higher Education Department, 2017)

¹³⁴ (N.M. Higher Education Department, 2017)

¹³⁵ (The National Academies of Sciences, Engineering and Medicine, n.d.)

¹³⁶ (National Conference of State Legislatures, n.d.)

¹³⁷ (HCM Strategists, n.d.; N.M. Legislative Finance Committee, 2017)

Reforms and Options

New Mexico schools continue to seek ways to increase efficiency and trim budgets to account for reduced revenues while at the same time delivering the education expected of its students, current and future.

REFORMS IN MOTION

If students succeed, so too do higher education institutions. To promote student success and timely completion, and collaboration among institutions, HED has led statewide articulation reforms called for in the Transfer of College Credits Act, which became law in 2017.¹³⁸ These articulation reforms reduce barriers to graduating on time and more efficiently guide students to graduating in an area that leads to meaningful and gainful employment. The three cornerstones of this effort include collaboration among New Mexico institutions to:

- Develop and sustain a common course numbering system, which can ease credit transfer and articulation for students who transfer to other New Mexico schools. (A crosswalk of the entire common course numbering system is scheduled to be implemented in Fall 2018.)
- Implement an improved general education core curriculum, emphasizing essential transferable skills that every college student should possess. (Identification and certification of courses begins in Spring 2018.)
- Develop statewide meta-majors to guide students to take the courses that will ultimately count toward their degree requirements for their major. (Institutions are currently uploading their degree plans that will undergo analytics to identify state meta-majors.)

The HED and HIEs are also working together to implement effective remediation strategies to help students graduate and graduate sooner with less debt.¹³⁹ (See Chapter 1, page 5, for information on remediation.)

New Mexico higher education institutions are also collaborating on their own, working together with industry. For example, the schools in the seven-county northern New Mexico region are working with Los Alamos National Laboratory (LANL) to better align students (K-12 and postsecondary) and the current workforce with growing regional industries.¹⁴⁰ Doing so could potentially improve financial stability for families and communities and foster future industry and economic growth in the region.

CREATIVE SOLUTIONS

In addition, most would agree that higher education institutions must start diversifying their funding sources through philanthropy, endowment fund growth, additional federal funding and expanded technology transfer.¹⁴¹ Some innovative ideas from higher education leaders include:¹⁴²

- Leverage available funds through the Workforce Investment Act (WIA) federal job training legislation that provides funding for training, employment and tuition assistance for low-income adults, dislocated workers and youth. The WIA funds are administered by the N.M. Department of Workforce Solutions.
- Link the Lottery Scholarship funds to an expectation that recipients will work in New Mexico; require students who leave the state after college graduation to pay back a portion of their scholarship (say, five percent of the first-year salary).
- Hire student case managers at HIEs who are connected with workforce centers, businesses and industry – thus improving students' abilities to get jobs after graduation (i.e., SUN PATH Consortium described in Chapter 5).
- Promote concrete financial investments by industry in higher education through grants, scholarships and internships, thus growing the pipeline of potential future employees.
- Improve enrollment and thus the amount of tuition received by developing relatable marketing campaigns demonstrating the value of higher education on daily household finances, future careers, and opportunities for self-discovery; potentially highlight the value of college for people who are bilingual in English and Spanish.

¹³⁸ (N.M. Higher Education Department, 2017)

¹³⁹ (N.M. Higher Education Department, 2017)

¹⁴⁰ (Grassberger, 2017)

¹⁴¹ (N.M. Legislative Finance Committee, N.M. Higher Education Department letter, 2017) (DeKay, 2018)

¹⁴² (Albuquerque Business First Higher Education Forum, 2017; N.M. Voices for Children, 2015)

Higher education was also on the minds of many state legislators during the 2018 state legislative session. Legislators offered proposals in the areas of higher education governance, establishing school to career pathways and fostering transferable skills for today's students and workforce such as through learning soft skills. (See Appendix F for a list of higher education related legislation introduced during the 2018 legislative session.)

At the federal level, U.S. Senator Martin Heinrich cosponsored the America's College Promise bill (S.2483/H.R.3709) which would create a new federal-state partnership to provide two years of tuition-free access to community or technical college programs that lead to a degree or industry-recognized credential. This legislation would:¹⁴³

- Create a new partnership between the federal government and states and Indian tribes to help them waive resident tuition in two years of community and technical college programs for eligible students, while promoting key reforms to accelerate student success
- Provide a federal match of \$3 for every \$1 invested by the state to waive community college tuition and fees for eligible students before other financial aid is applied
- Ensure that programs offer academic credits which are fully transferable to four-year institutions in their state, or occupational training that leads to credentials in an in-demand industry
- Maintain and encourage state funding for higher education
- Establish a new grant program to provide pathways to success at minority-serving institutions by helping them cover a significant portion of tuition and fees for the first two years of attendance for low-income students

The legislation is supported by the Association of Community College Trustees, American Association of Community Colleges, Center for Law and Social Policy, and Young Invincibles.

Student Case Study: Successful Transfers

TESSA SNYDER, MULTIPLE CAMPUSES



In Tessa Snyder's academic career, she has taken on pharmacy school, hands-on experiences in the health field, and co-founded a health career oriented student support group, all while serving as a reservist. Although Tessa knew from the sixth grade that she wanted to have a career in health, it was her internships in the field that solidified her passion. Committing to a health career academic path meant Tessa navigated successful transition from community college at UNM-Los Alamos, to UNM's main campus, then on to the UNM College of Pharmacy. Along the way, she received support from her fellow classmates, mentors, library resources and her family.

Tessa encourages postsecondary institutions to invest resources towards guiding each student through the many transitions required throughout their education. She also believes efforts should be made to ensure students are more aware of the opportunities and educational supports available to them before they begin as well as throughout their higher education journey.

Intersections and Conclusion

Higher education institutions are the foundations for our communities. They offer hope and opportunity to families and are the engines that drive workforce and economic development in our state. Access to higher education in a large geographic state is a challenge calling for continued effective use of technology and also ways to provide the in-person experiential learning that is so valued by students and employers. All things cost, however. How to pay for the type of education in demand and needed in our poor state is a significant challenge for New Mexico's higher education institutions. Today's bottom lines in higher education also call for more comprehensive measurement of institution performance. These ideas closely align with student success and student finance (addressed in Chapters 1 and 2), as well as industry partnerships to support future workforce needs (addressed in Chapters 4, 5 and 6). Continued collaboration among institutions, governments and industry may advance important reforms on these topics.

¹⁴³ (Heinrich, 2018)

Chapter 4

Workforce Integration and Alignment

Economic Opportunities for All

During the second half of the post-industrial 20th century and the first decade of the new millennium, American businesses competed by the steady deployment of innovative technologies, through increasing economies of scale, and from offshoring of manufacturing and services. Through the last several years, however, the businesses that top their competitors roll out *disruptive* technologies, capitalizing automated processes. During the 1990s and 2000s, mom-and-pop businesses lamented the pervasiveness of big-box retailers.¹⁴⁴ Since 2010, even the ubiquitous chain stores with guaranteed everyday low prices are fighting not be overtaken by online merchants.¹⁴⁵

The fact is, today’s businesses must adapt at a pace never before seen to keep their doors – hinged or virtual – open. Workers are required to adapt just as fast. New Mexico’s high school and college graduates cannot be merely prepared to enter the workforce; in this rapidly changing global economy, the skills of gainfully employed workers must be continuously augmented, integrated and aligned with the needs of New Mexico’s existing employers and those that might come here. **This chapter focuses on alignment between higher education and employer workforce needs, across all types of industries.**

KEY CONSIDERATIONS

New Mexico’s population shrunk in the last decade, and with it, the labor force. How can educational institutions quickly optimize the training of our labor force, both existing and incoming? How can they align with the rapidly changing needs of employers and for high-demand, high-skill, high-income occupations? Given the current labor projections, how might New Mexico avoid a workforce surplus of more college graduates than jobs?

The Economy, Population, Employment and Income

Through much of the 2000s, New Mexico’s unemployment rate tracked with or was better than the national average. The state’s economy was creating jobs, and the population was growing, especially in metropolitan areas. In 2007, employment topped 900,000, and the state’s unemployment rate dipped to its lowest mark, at 3.7 percent.¹⁴⁶ The state government was in surplus, largely due to oil prices.¹⁴⁷

However, New Mexico’s relative prosperity was unable to withstand the meltdown of global financial markets in 2007, which triggered the Great Recession in December 2007. Within a matter of months, New Mexico’s economy shed 50,000 jobs.¹⁴⁸ The recession officially ended in June 2009, but rebuilding New Mexico’s economy has since lagged behind the nation, making our state

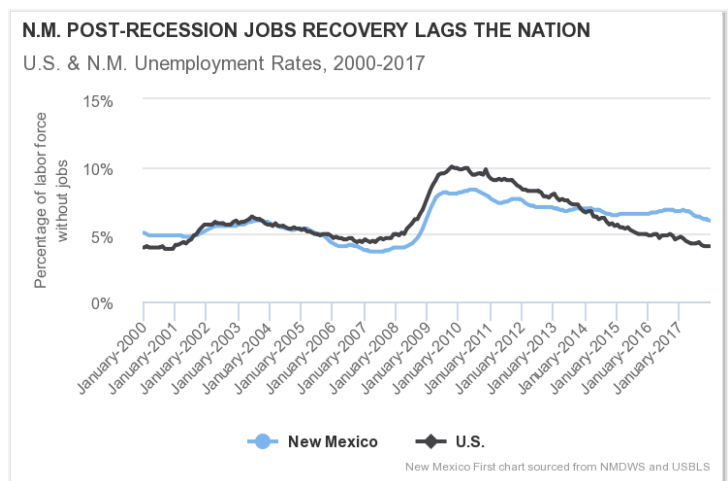


Figure 14: Unemployment rates, 2000-2017, N.M. and the U.S.

¹⁴⁴ (Worstell, 2013)
¹⁴⁵ (Elliott, 2018; Petro, 2017)
¹⁴⁶ (NMDWS; USBLS)
¹⁴⁷ (Cole, 2018); OECD
¹⁴⁸ (Cole, NMDWS et al.)

one of a few to not recover its lost jobs.¹⁴⁹ *Albuquerque Business First*, a multi-media news outlet, recently stopped publishing its “Recovery Index,” not because Albuquerque is again whole, but because the index is not changing much month to month.¹⁵⁰ As of December 2017, nearly 880,000 were employed in New Mexico’s labor force, and the state’s 6 percent unemployment rate was considerably worse than the nation’s 4.1 percent and, among states, better than only Alaska’s.

In December 2017, among New Mexico counties, Union and Los Alamos had the lowest unemployment rates, both about 3 percent. The highest jobless rate, at 16 percent, belonged to Luna County. Luna has seen a decades-long run of extraordinarily high unemployment (as high as 37.5 percent in April 1996).¹⁵¹

THE EXODUS AND DISPARITIES

In the decade since the Great Recession, New Mexico also lost people. New Mexico’s anemic recovery led to an out-migration of more than 37,000 people between 2010 and 2016.¹⁵² Thousands of those who left New Mexico were college graduates.¹⁵³ Two of the largest groups in the exodus were professionals aged 40 to 54 and children aged 5 to 19.¹⁵⁴ What that means is that, in addition to the educated workforce shrinking, a large number of school-age children will have left the state before graduating high school and entering one of New Mexico’s higher-education institutions, causing the future talent pipeline to further fall short of employer demand.

Nationally, Baby Boomers (the generation born between 1946 and 1964) are turning 65 at the rate of 10,000 a day and often retiring. Additionally, other groups of people are leaving the labor force.¹⁵⁵ The nation’s labor force participation rate (LFPR) peaked in 2000, at 83 percent. The main reason the LFPR has fallen is a drop among prime age workers (ages 25-54).¹⁵⁶ Declines in employment among young and prime-age adults stem in part from reduced trade and increased use of robots.

In 2016, New Mexico’s per capita personal income (PCPI) was \$38,474, which places the state near the bottom nationally, ranking it 48th.¹⁵⁷ (To compare, the national PCPI for the same year was \$49,246.) Further, these relatively low personal income numbers contribute to the state’s overall poverty levels; roughly one in five New Mexicans live in poverty.¹⁵⁸ Only Louisiana and Mississippi rank worse.

Within the state, regional disparities in pay can seem as far apart as the miles between them. For the second quarter of 2017, New Mexico’s average weekly wage (of full and part-time workers combined) was \$823, including commissions, bonuses and overtime pay. Atop the list for counties’ average weekly wages is Los Alamos County, averaging \$1,491 for second quarter of 2017. New Mexico’s oil-producing counties Eddy and Lea second and third on the list with \$1,032 and \$936, respectively.¹⁵⁹ At the bottom of the list was Guadalupe County, where the average weekly wage was \$572.

OCCUPATIONS

At the turn of the millennium, *Rise of the Creative Class* author Richard Florida estimated that 30 percent of the U.S. workforce – 38 million – was comprised of scientists, engineers, architects, designers, writers, artists, or others for whom “creativity is a key factor.”¹⁶⁰ Florida predicted this group would change the way we work and the very fabric of everyday lives.¹⁶¹ Updating his work in 2014, Florida estimated the number of U.S. workers among the “creative class” at 50 million, with New Mexico’s share at roughly 225,000.¹⁶²

¹⁴⁹ (NBER, 2010), (Cole, 2018)

¹⁵⁰ (Vadnais, 2017)

¹⁵¹ (NMDWS, USBS)

¹⁵² (BBER, 2017)

¹⁵³ (Cole, 2018)

¹⁵⁴ (Krasnow, 2017)

¹⁵⁵ (Center for Economic Policy and Research, 2016)

¹⁵⁶ (Mui 2016; Center for Economic Policy and Research, 2016)

¹⁵⁷ (U.S. Bureau of Economic Analysis)

¹⁵⁸ (U.S. Census Bureau SAIPE Program, 2017)

¹⁵⁹ (NMDWS QCEW, 2017)

¹⁶⁰ (Florida, 2012)

¹⁶¹ (Florida, 2012)

¹⁶² (Florida, Maddox Distinguished Lecture, 2014)

While the creatives make a key part of the workforce, most of our jobs are more traditional. New Mexico's mix of occupations is similar to the rest of the country. Nearly half of all employment in the state consists of the three largest major occupational groups: office and administrative support; food preparation and serving-related; and sales and related.¹⁶³ All three of these occupational groups paid less than the average of all New Mexico jobs in 2016, which was \$44,160. (See Appendix J for information on earnings by occupation).

Gaps in Education, Skills

New Mexico has a less-educated populace than the surrounding states and the nation, and improvement is not expected in the near future.¹⁶⁴ Analyses of educational pipeline data suggest that at least half of New Mexico students will not earn a college credential or degree by their mid-twenties.¹⁶⁵

COMPARING WITH COLORADO

It comes as no surprise that Colorado, whose median household income is roughly 40 percent higher than New Mexico's, also boasts a well-educated population. More than half of residents hold at least an associate degree, compared with 38 percent in New Mexico.¹⁶⁶ Possibly influencing Colorado's level of income even more is the proportion of its workforce with a bachelor's degree, about 43 percent.¹⁶⁷

Almost 29 percent of New Mexico's labor force holds a bachelor's degree or higher, but only a fourth of the jobs in the state require that level of education.¹⁶⁸ While this imbalance could be interpreted to mean some employers are overqualified for their positions, or underemployed, it is more likely that employers prefer additional skills beyond the posted minimum level of education and are drawing from this more competitive pool. These additional skills may have little to do with formal education; it is important to view education as only a part of the overall evaluation of how well the workforce aligns with demand.

EMPLOYER SURVEY

In 2014, the New Mexico Department of Workforce Solutions (NMDWS) commissioned an employer survey to better understand job applicants' qualifications and readiness, whether gaps existed between skills and job requirements, how those gaps affected employers' productivity, and what employers were doing to bridge the gaps.¹⁶⁹ The vast majority of employers reported they could find plenty of job applicants with the needed education levels, but about 47 percent had difficulty finding candidates with the actual needed skills.¹⁷⁰ Many of the abilities applicants lacked could be characterized as "soft skills." The abilities most cited by employers as deficient were:

- Occupation-specific skills, 52.5 percent
- Work habits, 52 percent
- Communication, 47 percent
- Problem solving, 46 percent

Non-skill, "character-related issues" were cited as well. Almost a fifth of employers reported issues with work ethic, drug abuse, accepting supervision or teamwork.¹⁷¹ Because they were not able to find enough qualified applicants, 21 percent of employers reported a reduction in the firm's product or service quality; 20 percent cited a reduction in output or sales. One in 10 said not finding qualified applicants prevented them from expanding their facilities.

¹⁶³ (NMDWS, 2017)

¹⁶⁴ (Southern Regional Education Board, 2015)

¹⁶⁵ (NMDWS, 2017)

¹⁶⁶ (U.S. Census Bureau SAIPE Program 2017; U.S. Congress Joint Economic Committee, 2017)

¹⁶⁷ (NMDWS, 2017)

¹⁶⁸ (NMDWS, 2017)

¹⁶⁹ (NMDWS, 2014)

¹⁷⁰ (NMDWS 2014)

¹⁷¹ (NMDWS 2014)

Nearly three-fourths of employers surveyed provide training to employees, with the preferred method being in-house. When asked what level of training or education would be required for the organization to reach the desired level of productivity and competence, roughly half of employers said their employees would need a certificate or an industry-recognized credential.¹⁷²

Future Jobs, Education Required

Experts predict that the number of New Mexico jobs will grow from 853,910 in 2014 to 919,743 by 2024.¹⁷³ Occupations that require high school or less are projected to add approximately 42,000 jobs. Jobs requiring a bachelor’s degree are expected to grow by 13,500; and jobs that require a master’s degree will increase by 2,300.¹⁷⁴

Based on the average number of graduates New Mexico colleges and universities recently produced, a simple gap analysis would suggest that we have an “occupation oversupply.” Economist Bob Grassberger explained in a recent workforce report on north-central New Mexico that this situation occurs when the average supply of workers exceeds the demand.¹⁷⁵ One conclusion, looking at the table below, may be that if New Mexico’s economy does not create more jobs suitable for associate, bachelor’s and master’s degree holders, the brain drain will continue. Currently, New Mexico is essentially subsidizing education for the states to which our graduates relocate.

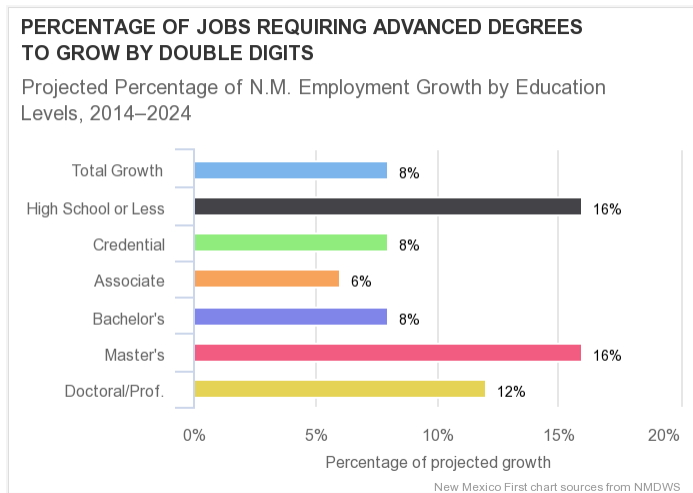


Figure 15: Rate of projected growth by education levels, 2014-2024

TABLE: GAP BETWEEN JOBS AND DEGREES

Level of Education	Projected Annual Openings, 2014-2024 (Demand)*	Average Annual Completions, 2010-2015 (Supply)	Average Annual Gap
Associate Degree	702	8,477	(7,775)
Bachelor's Degree	5,148	8,592	(3,444)
Master's Degree	559	3,294	(2,735)
Doctoral or Professional	707	633	74

Sources: Annual openings from NMDWS. Annual completions from Integrated Postsecondary Education Data Systems.

This table presents one way to view New Mexico’s education and workforce gap. Its results are surprising – in fact, reverse – from what most economic developers and educators would expect. From these data alone, it appears New Mexico is graduating almost 14,000 more college graduates a year than it has jobs for. However, NMDWS economist Ashley Leach warned there “are a lot caveats to consider, the biggest that we don’t really know how large or small the gap is without having more information on those program completers.” Some of these graduates likely accept jobs for which they are overqualified. Others leave New Mexico. Some become entrepreneurs, and still others are already in the workplace and earning their degree at the same time. Perhaps the most obvious answer is that New Mexico is not necessarily graduating people in the fields for which we have occupational openings. Whatever the reasons, the gap warrants further discussion and scrutiny.

¹⁷² (NMDWS 2014)

¹⁷³ (NMDWS 2017; NMDWS In-Demand Occupations 2016)

¹⁷⁴ Grassberger says not to count the Baby Boomers out as they enter their expected retirement years. Many Boomers are taking spending a couple of years in retirement and then returning to the workforce, starting companies or volunteering. Because of modern life spans, Boomers can remain be in the talent asset column for many years to come.

¹⁷⁵ (Grassberger 2017)

SECTORS PROJECTING GROWTH

For the 2014-2024 period, just three major sectors make up nearly two-thirds of all projected employment growth: healthcare and social assistance, accommodation and food services, and educational services.

The NMDWS projects the healthcare and social assistance sector will grow by 28,465 jobs by 2024. *(For this reason, this report devotes the entire Chapter 5 to the healthcare workforce.)* Two jobs requiring minimal formal education will deliver the vast majority of the annual job openings in this sector: personal care aides (at 1,080 each year) and home health aides (at 350 each year).¹⁷⁶ The median wages for these jobs averages about \$20,000 a year. Similarly, the accommodation and food services sector is projected to create 13,160 jobs by 2024. Many of the openings will be for waiters, cooks, bartenders and related fields. These careers pay an average of \$17,000 a year.¹⁷⁷

All the “high demand” jobs above are described as requiring “No Formal Educational Credential,” and they all have a mean wage of less than half the state average in 2016.¹⁷⁸ **This volume of low-wage jobs – coupled with the workforce gap data in the table above – point to the critical question of how can New Mexico grow the number of high-skill, high-wage jobs to grow the economy in a smart way.**

Economic Development Hinges on Ready Talent

Given that the 2024 jobs outlook data show that many thousands of high-demand jobs in high-growth sectors are essentially low-wage jobs, New Mexico is at a crossroads. These jobs pay far less than the most recent PCPI of \$38,474. New Mexico will not likely improve its poverty ranking we only create low-wage jobs. The best way to predict the future is to create it, and the gap between projected jobs and educated workers may be the evidence New Mexico needs to spur efforts to create a more purpose-driven economy.¹⁷⁹

For decades, the conventional wisdom of economic development was that geography, infrastructure or natural resources were lynchpins to a company’s location decision. And with such cost-driving assets, companies and industries may cluster to gain productive efficiencies.¹⁸⁰ However, research now shows that human capital, measured by level of education, correlates directly with regional economic success. Places grow more rapidly where higher numbers of talented people live, and those places attract yet more talent. As a result, economic development focus more than ever on human capital.

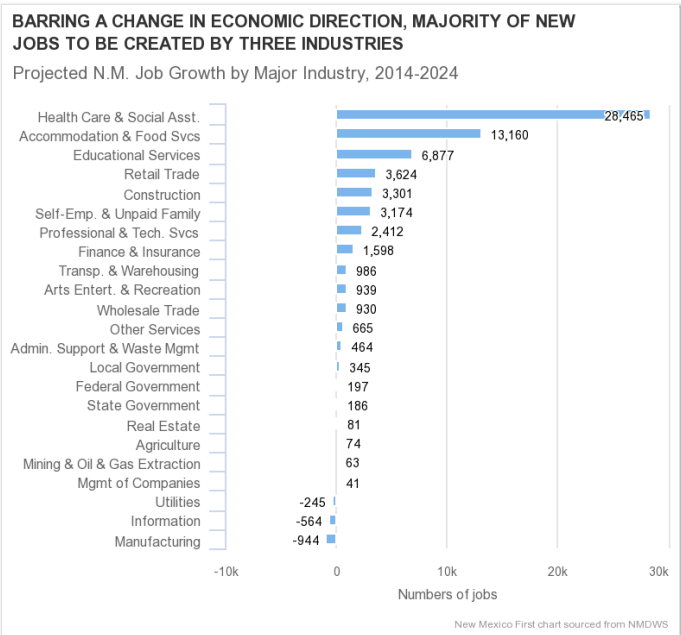


Figure 16: Major N.M. industry employment increases, projected, 2014-2024

¹⁷⁶ (NMDWS In-Demand Occupations, 2016)

¹⁷⁷ (NMDWS In-Demand Occupations, 2016)

¹⁷⁸ (NMDWS In-Demand Occupations, 2016) Note: High demand means more projected openings than 90 percent of all occupations and greater percentage growth than 75 percent of all occupations.

¹⁷⁹ The 2016 New Mexico First town hall *Economic Security and Vitality for New Mexico* yielded the recommendation “Advance a Purpose-Driven Economy,” which entails “a strong workforce, deploying an approach (such as ‘Human-Centered Design’) that enables individuals and communities to recognize, understand and overcome challenges through an action-oriented feedback and adjustment process.”

¹⁸⁰ (Florida, 2003)

JOBS COUNCIL

New Mexico’s higher education institutions are producing certificate and degree holders at rates that outpace the number of jobs that need them. High unemployment and high poverty are telltale signs that talent is not aligned with the needs of existing and potential employers.

From 2013 to 2016, the New Mexico Legislature’s Interim Jobs Council advanced research to gather clarity and consensus on what it would take to get the state back to pre-recession employment levels.¹⁸¹ Through dozens of deliberations, the Jobs Council concluded that the state must create 140,000 economic-base jobs in the next 10 years. The Jobs Council identified eight basic sectors in which the state could create those jobs: employer recruitment, retention and expansion (traditional economic development activities); solo workers (performing full-time work from a home office, for example); startups; energy and extractives; visitor (tourism and business travel); film and digital media; federal government; and agriculture.

In its final summary report, the Jobs Council wrote that one of the greatest barriers to new economic-base growth is the lack of qualified workers. The report also said it is important to determine how many workers, with what skills, will be needed.

THE BRIDGE OF SOUTHERN NEW MEXICO

A model of local job-creation planning has been launched in Doña Ana County, which is part of the greater two-country, three-state region known as the Borderplex. Economic development efforts have long sought to promote the business advantages of the region’s geography, infrastructure and natural resources. Local development entities came to realize that their work might fail without a skilled and ready workforce.

The nonprofit organization Bridge of Southern New Mexico convened a broad group of community leaders to form the Workforce Talent Collaborative (WTC). The collaborative focused on eight industries with the greatest potential to succeed, based upon the assets already in place and their higher wages.¹⁸²

1. Healthcare
2. Digital media
3. Advanced manufacturing
4. Transportation and logistics
5. Energy
6. Aerospace
7. Defense
8. Value-added agriculture

The WTC sees itself as transforming the “future of the region by boosting the earning potential of its citizens,” its workforce plan reads. The group believes that providing people with skills and knowledge to succeed in higher-paying careers ladders will “ripple across the county in an economic cascade of increased incomes and buying power, along with improving every social determinant of health that has held back our citizens for far too long due to the pervasiveness of poverty.”

The WTC mobilized community members toward the goal of workforce talent development, illustrated by Figure 17. “Awareness gaps” are among the barriers WTC identifies to “long-term cultural change in the community.” The WTC is, therefore, targeting members of the talent pipeline about area industries, their respective career opportunities, and the required knowledge, skills and abilities to be successful. In addition, the organization

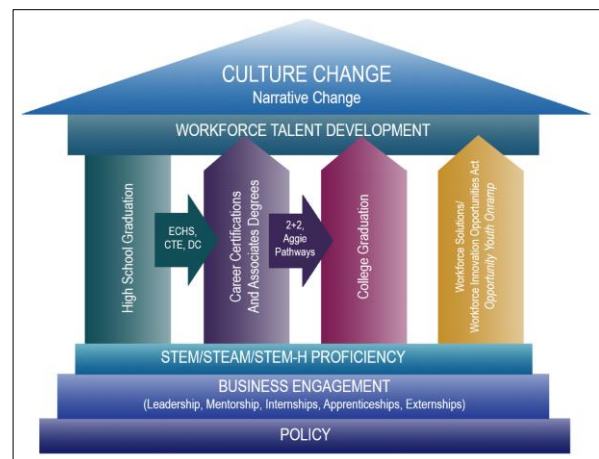


Figure 17: The Bridge of Southern New Mexico approach to workforce talent development

¹⁸¹ (Jobs Council, 2015)

¹⁸² (The Bridge of Southern New Mexico, 2017)

connects people to: skills assessments and skill-based credentials; available training resources; real-time job and career opportunities; and opportunities for the business community to be part of the solution.

WTC has developed “five ships” by which businesses can help build a “larger pool of skilled and ready talent”: leadership, mentorship, internship, apprenticeship and externship.

NEW MEXICO PATHWAYS PROJECT

Innovate+Educate, a nationally recognized nonprofit organization headquartered in Santa Fe focuses on the adoption of new industry-driven, competency-based hiring processes that can create pathways to employment for workers left behind in the current system. The organization has an “assess, hire, train, advance” model to align the workforce with employers.¹⁸³ The New Mexico Pathways Project is funded by the W.K. Kellogg Foundation to design education-to-employment plans to unify economic and workforce development. Thus far, the project has operated in five New Mexico regions: Bernalillo County, Doña Ana County, Gallup- McKinley County, Santa Clara Pueblo and San Juan County.

Each regional plan addresses barriers and uses real-time data, predictive analytics, demographics, economic data and critical input from the community. For example, the three-year plan for Gallup-McKinley County makes the following seven issues:

1. Aligning education to training, credentials and high-demand areas
2. Connecting candidates to employment and employers to candidates via the “seek platform” (technology owned by Innovate+Educate)
3. Addressing remediation needs in the county by expanding resources and access
4. Focusing on a healthcare ecosystem
5. Childcare
6. Transportation
7. Advancing a community initiative that involves all NM Pathways working groups participating in a diversity and cultural workshop to assure a trusting community working together on the plan

Innovate+Educate is also partner in TalentABQ, along with the City of Albuquerque, the W.K. Kellogg Foundation New Options Project, CNM, and the NMDWS. Launched in 2013, the program is “a combination of job training, skills assessment and testing that will match could-be employees with employers ... built around 26 centers that offer free services.”¹⁸⁴ In addition, Innovate+Educate plans to run a statewide pilot this year of a free soft-skills assessment, Core Score. The test will measure core competencies like critical thinking, communication and customer service.¹⁸⁵

WORKKEYS

New Mexico job-seekers who do not possess college degrees can get their job skills validated through the WorkKeys skills-assessment system. The assessments are conducted by New Mexico Workforce Connection “one-stop” centers across the state to connect job-seekers with hiring employers.

Interested employers can register with WorkKeys at local Workforce Connection offices. Through an agreement with ACT – the company that developed the college-entrance exam – any employer in New Mexico may use this tool without paying fees. The employer matches company-specific job descriptions with occupational profiles from ACT’s database of nearly 20,000 job titles.¹⁸⁶ Each occupational profile lists skills and levels of proficiency needed for applicants to be successful.

¹⁸³ (Innovate+Educate, 2017)

¹⁸⁴ (Mayfield, 2013)

¹⁸⁵ (Blivin, 2018)

¹⁸⁶ (ACT, 2014)

WorkKeys has been used by Innovate+Educate in both its N.M. Pathways Project and TalentABQ initiatives.¹⁸⁷ WorkKeys can screen for foundational skills (i.e., communication, problem solving and interpersonal skills) and performance skills (i.e., negative work attitudes and risky work behavior). When the assessments expose skills deficiencies, ACT closes the gaps by educating job-seekers with its online and interactive program, KeyTrain.¹⁸⁸ Job-seekers who successfully complete the three assessments (applied math, locating information, and reading for information) receive a National Career Readiness Certificate.

Out of New Mexico’s 33 counties, only two are ACT-certified “Work Ready Communities,” as part of their economic development strategies – San Juan County and Quay County.¹⁸⁹ With their certifications, they can more readily attest to the capabilities of the local workforce when potential employers are evaluating their communities.

Workforce Innovation and Opportunity Act, State Plan

New Mexico has 21 Workforce Connection Centers, whose charge is “to promote and align workforce readiness activities for adults, dislocated workers, youth, individuals with disabilities and senior workers.” In addition to administering the WorkKeys assessments described above, services include adult education courses, job-seeker assistance and vocational rehabilitation. Statewide, the centers served more than 65,000 people in 2016.¹⁹⁰

In addition to the physical centers, the NMDWS also offers a virtual Workforce Connection Center online with similar services. The website features an innovative career literacy tool, “Why I Work.” Program administrator Yolanda Montoya-Cordova said the tool enables users to plan their career in reverse, starting with the salaries required for the lifestyle they want. After determining their desired income, users view jobs that would provide sufficient pay. Job titles correspondingly list the educational attainment required. The tool even maps differences in pay and costs of living within the state.

The local centers are overseen by four local Workforce Development Boards, representing the northern, southwestern, central and eastern regions of the state. The boards promote business and community partnerships to grow local economies. In recent years, the boards advanced reforms to make the centers more effective, including aggregating multiple employment and social services under one roof. This change required coordination between the state departments of workforce development, economic development and human services. However, data integration between the core partners remains a challenge.¹⁹¹

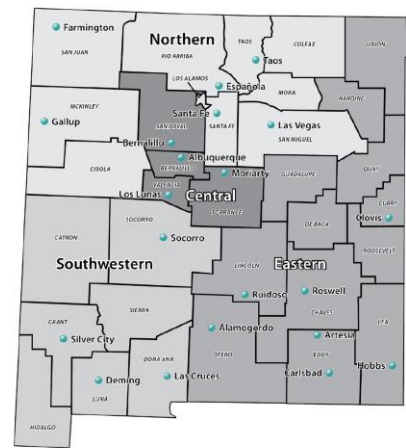


Figure 18: The NMDWS oversees 21 Workforce Connection Centers. (NMDWS)

Industry-Based Innovations in Higher Education

The first two chapters of this report address opportunities and progress among higher education institutions. Additional types of innovations exist, specifically for industry-specific coursework that can create a strong and versatile labor pool.

New Mexico community colleges are well-known for responding to industry needs and for adapting to offer training in fields where workers are needed. For the 2016-2017 fiscal year, CNM delivered almost 60,000 non-credit workforce training hours.¹⁹² Behind CNM for the same period were New Mexico Junior College (NMJC) and San Juan College, both topping 40,000 non-credit training hours.¹⁹³ (See Appendix E for a list of non-credit training

¹⁸⁷ (W.K. Kellogg Foundation, n.d.)

¹⁸⁸ (ACT, 2014)

¹⁸⁹ (ACT, 2018)

¹⁹⁰ (NMDWS WIOA, 2017)

¹⁹¹ (Grassberger, 2018)

¹⁹² (N.M. Association of Community Colleges, 2018)

¹⁹³ (N.M. Association of Community Colleges, 2018)

hours delivered by other New Mexico community colleges.) While the classes seldom offer hours for college credit, they provide critical job-specific training hours. Through fees and state funding, the training hours also provide the schools with an additional revenue source. For example, NMJC collaborates with training partners (such as other colleges or industry experts) to offer customized training to area employers.¹⁹⁴ One example is oil and gas safety training using an OSHA-approved instructor.

Steve Saucedo, NMJC's workforce training director, said courses are fueled by demand, which is determined through surveys and informal networking at Rotary clubs or chambers of commerce. Organizers take pride in their ability to ramp up or down as needed, and their willingness to take training to the worksite.¹⁹⁵ Similar examples exist at other institutions. Central New Mexico Community College offers Deep Dive Coding Bootcamp to train web and app developers and a Cybersecurity Academy, which is a potential growth area for New Mexico.¹⁹⁶

These types of targeted training may be particularly promising for New Mexico's unemployed or "hard-to-employ" people. These can be valuable to mid-career workers whose industries have shut down to find new skills. Concrete, hireable skills can make a huge difference for men and women trying to move out of poverty.

Job Training Incentive Program, Step Up

An often-cited economic development incentive for expanding New Mexico businesses, and recruiting businesses to relocating here, is the Job Training Incentive Program (JTIP). The program reimburses 50-75 percent of employee wages for up to six months of on-the-job training. Custom training at a New Mexico public educational institution may also be reimbursed. An additional 5 percent may be reimbursed to companies that utilize WorkKeys as part of their hiring process, hire recent New Mexico college graduates, or hire U.S. veterans.

The state Economic Development Department says JTIP has supported the creation of more than 46,000 jobs for New Mexicans in nearly 1,500 businesses.¹⁹⁷ JTIP-eligible companies are non-retail, economic-base employers creating new jobs as a result of expansion in or locating to the state. In addition to retail, employers in the agriculture, construction, extraction, gambling and healthcare industries are not eligible.

A recent JTIP survey shows 86 percent of employees who benefited from JTIP are still employed in New Mexico, 78 percent have seen wage increases, and 71 percent saw increases of more than 10 percent.¹⁹⁸ In any given year, employer requests for JTIP grants outstrip the funding allocated to the program by the Legislature. In 2018, the Legislature allocated \$9 million for the next fiscal year, short of the \$12 million requested.¹⁹⁹ To encourage greater investment in employee wages and capital, the state also offers training reimbursement through its Step Up Program. This program is part of JTIP but operates with different criteria, serving different types of employers.²⁰⁰

Five Ways to Connect College and Careers

While colleges across the county are producing plenty of certificate and degree holders, the widespread misalignment between education and the labor market has resulted in graduates saying they have buyer's remorse. While they are generally happy with their decision to attend college, more than half would do things differently if they could, like choose a different major, school or credential.²⁰¹

Aligning college education and training more closely to careers, a recent Georgetown study argues, can be done effectively through a "learning and earning exchange" model in which:²⁰²

- Learners better understand how their choices of college programs connect to fulfilling lives and careers
- Colleges refresh and strengthen programs to improve student outcomes
- Employers more precisely identify and hire talented workers

¹⁹⁴ (Saucedo, 2018)

¹⁹⁵ (Saucedo, 2018)

¹⁹⁶ (CNM Ingenuity, 2017)

¹⁹⁷ (NMEED, n.d.)

¹⁹⁸ (NMEED, 2017)

¹⁹⁹ (Davis, 2018)

²⁰⁰ (NMEED, 2017)

²⁰¹ (Georgetown news release, 2017)

²⁰² (Georgetown, 2017)

- Policymakers effectively allocate resources to build strong economies

To advance these goals, Georgetown recommends that states develop five sets of tools (most of which exist in New Mexico to some degree):

1. **Published data** on education projections, business expansion, and workforce quality to show employers if the state's higher education system can provide workers with the needed skills
2. **Program alignment tools** to help college administrators make program decisions that address labor needs and demonstrate return on investment to state leaders
3. **Curriculum alignment tools** to help faculty create coursework teaching the skills learners need in their careers
4. **Counseling and career pathways** to help advisors support students in their educational and career decisions
5. **Skills gap tools** to help workers determine if their abilities are transferable to new jobs and identify any needed training

Student Case Study: Retraining for a Second Career

GREG POWE, AEROSPACE PROJECT MANAGEMENT AND FACILITIES



Greg Powe's commitment to life-long learning has led to a rewarding career in New Mexico's aerospace industry. For 22 years, Greg worked at the White Sands Space Harbor providing astronaut training and landing opportunities for the NASA space shuttle program. When the shuttle program ended, Greg realizing he needed to develop new skills to be marketable. He utilized resources from the NMDWS and enrolled in classes at Doña Ana Community College.

Greg believes that getting back into the workforce as an older employee was the biggest barrier he faced. However, the classes Greg took helped him to overcome the challenge. These courses improved his "professional tool box," allowing him to gain skills in Microsoft Office programs, critical thinking, professionalism and leadership in the workplace, as well as resume building. Greg's return to school paid off and he was hired by a private aerospace firm to be its facilities manager at Spaceport America. According to Greg, schools that foster a direct connection between employers and students through experiential learning, internships and apprenticeships provide the best ways to ensure student success and career fulfillment.

Update: Since the time of this interview, a company reorganization resulted in Greg finding himself in the job market. Due to his training and experience, he was quickly hired to do aerospace work for a Kansas company and has relocated there.

Intersections and Conclusion

When New Mexicans imagine the economy of our future, most envision a wide array of jobs that are interesting, pay well and engage our people to stay in the state. However, when problems like "brain drain" deplete New Mexico's talent pipeline, the labor force that remains must increasingly compensate for the absence. The higher education system's ability to produce graduates who are valuable to the labor market relies on continuous engagement with employers. In what ways can employers more effectively inform the development of courses and degrees that meet their needs? How might community colleges and universities incorporate structured skills programs into their two- and four-year degree plans? Campuses may also consider hosting satellite one-stop centers that provide skills-assessment and employment services.

Additionally, on-the-job and other skills-based training is equally critical to New Mexico's current and future workforce. How can educators, workforce developers, and employers coordinate to meet today's immediate needs and tomorrow's desired future? While this chapter lays a foundation for answering that question, clues also lie in other parts of the report. Chapters 5 and 6 each address specific workforce needs for two critical New Mexico industries, healthcare and energy. Chapter 1 offers insights into direct worker training opportunities afforded through community colleges. And the fundamental ability to collaborate across institutions without duplicating efforts is a key topic of Chapter 3. Committed New Mexicans, coming together across interest areas, can find paths forward to advance our future.

Chapter 5

Healthcare Workforce

Overcoming Barriers to Rewarding Careers

A career in healthcare has long been valued by our society. For most people it is a rewarding line of work, one in which a person can support a family, be a respected member of the community, and make a difference. Unfortunately, New Mexico is not producing or recruiting enough healthcare providers to serve the critical health needs of our state. For those aspiring to be healthcare professionals, a lack of educational preparation or funds to pay for additional education present substantial barriers for most New Mexico students. New Mexico and its higher education institutions continue to invest in health career degree and certificate programs that are supportive and inclusive of students from all communities. **This chapter offers a foundation to expand the healthcare workforce pipeline, thereby improving the health and economic opportunity in all New Mexico communities.**

KEY CONSIDERATIONS

Given the high demand for healthcare professionals, and the existence of a broad range of healthcare education and training programs, what more can be done to increase the number of providers? How can we scale-up successful education programs that cultivate our own New Mexico students and also bring in students and providers from out-of-state? What policies are needed to support increasing consumers' access to healthcare providers throughout the state?

Higher Education Institutions Healthcare Programs

The healthcare industry is an important part of the New Mexico economy, a recognition that is built into most New Mexico higher education institutions that offer a variety of health-related certificates and degree programs. For example, bachelor's, master's and doctoral programs include:

- Physician (MD)
- Physician residency programs
- Nursing (RN-Bachelor of Science)
- Nurse-Midwifery (Master of Science in Nursing or Post-Master's Certificate)
- Nurse practitioner – family, pediatric, psychiatric, and adult-gerontological acute care
- Nutrition and dietetics (Bachelor of Science)
- Physician assistant (PA – Master of Science)
- Occupational therapy
- Osteopathic medicine (DOM)
- Pharmacist (PharmD)
- Physical therapy

Certificate and associate programs

- Certified nursing assistant
- Community health worker
- Dental assistant
- Dental hygienist
- Emergency medical technician, paramedic
- EKG technician
- Health information technology - medical coding, cyber security, electronic health information
- Home health aide
- Licensed practical nurse (LPN) (dual credit programs available with some high schools)
- Medical assisting
- Nursing (RN), and Pre-nursing
- Occupational therapy assistant
- Personal care attendant
- Pharmacy technician, clinician
- Phlebotomy
- Radiologic technology
- Respiratory therapy
- Surgical technology
- Vision care technology

Healthcare and the Economy

Healthcare is the predominant, well-paying industry on the rise in the state and accounted for two-thirds of the state's job growth from 2014-2016.²⁰³ It was one of the few New Mexico industries that saw a rise after the 2008 recession. The state's Veterans Administration Health Care System, Lovelace Health Systems, Presbyterian Healthcare Services and UNM Health System are among the state's industry leaders. Healthcare jobs provide New Mexico families the promise of economic security and stability, offering higher average salaries than other growing sectors such as the service industry.²⁰⁴ Healthcare practitioners enjoy a mean salary of about \$73,000.²⁰⁵

The greatest number of new healthcare jobs are for ambulatory healthcare services (i.e. outpatient medical services that take place at dialysis clinics, ambulatory surgical centers, hospital outpatient departments, and the offices of physicians and other health professionals).²⁰⁶ Other related sectors include social assistance, long-term and residential care nursing, home health and hospitals. The increase in healthcare sector is due to multiple factors including the number of aging baby boomers, the expansion of Medicaid and other insurance coverage under the Affordable Care Act, and consequent increased demand for medical services.²⁰⁷ The healthcare industry both brings in and relies on federal dollars through Medicare, Medicaid and other federal healthcare programs.

Healthcare Workforce Gaps

While the promise of jobs in healthcare fields exist, vacancies persist. On any given day there are over 228 unfilled physician openings in New Mexico, with an average of 75 family physician, 25-30 pediatric physician and 60 nurse openings.²⁰⁸ These vacancies represent only those healthcare employers who are actively seeking assistance in filling the positions. It does not account for the many other standing vacancies in which employers have given up.²⁰⁹ The state cannot fill these openings from its population alone. Therefore, the state must continue efforts to grow its own healthcare providers and actively recruit and retain providers from outside the state.

The shortfall, coupled with uneven distribution of providers throughout the state, is impacted by the number of people who became newly insured in 2014 through the Affordable Care Act.²¹⁰ In the near-term, the lack of supply will result in longer wait times to providers and more difficulty accessing specialists. As New Mexico's population expands and becomes proportionately older, the state can expect even greater healthcare access problems.

Reasons for New Mexico's vacancies and provider shortage include:²¹¹

- **The overall low high school graduation rate, as well as students' math, science and reading performance:** Healthcare jobs require math and reading competency and education beyond a high school degree.
- **Brain drain:** There is a growing number of young and working age New Mexicans who seek education and/or work elsewhere. In rural communities, one source of providers is local young people who return home after college. However, brain drain can also describe these people choosing to live in metropolitan areas instead.
- **High Medicaid and Medicare populations:** A substantial portion of New Mexico healthcare dollars come from Medicaid and Medicare, which pay less than other insurers. Therefore, employers cannot offer as competitive salaries as out-of-state employers. This issue matters to young professionals paying off student loan debt.
- **High percentage of people with complex health problems:** New Mexico's healthcare professionals treat many patients with complex and chronic conditions, placing a substantial daily strain on primary care practitioners. They often burn out, choose to practice elsewhere, or switch to a specialty practice. Primary care providers in community clinics commonly see 25 patients a day, often resulting in more than a 12-hour workday.

²⁰³ (Krasnow, 2018)

²⁰⁴ (N.M. Department of Workforce Solutions Economic Research and Analysis Bureau, 2015)

²⁰⁵ (Russell, 2015)

²⁰⁶ (Grassberger, 2017)

²⁰⁷ (Krasnow, 2018)

²⁰⁸ (N.M. Health Resources, 2018)

²⁰⁹ (Harrison, 2018)

²¹⁰ (N.M. Department of Health and Allied Agencies, 2015)

²¹¹ (Harrison, 2018), (N.M. SUN PATH Consortium, 2018)

- **Lack of adequate staffing to support higher level providers:** Provider vacancies for healthcare providers at all levels mean those practicing must carry a heavier load.
- **Shortage of available slots in education programs for qualified applicants:** New Mexico healthcare programs must often turn away qualified applicants due to lack of faculty and funding.

Increasingly, medical assistants, technicians and home health aides are called on to provide more frontline patient work. Twenty-nine percent of healthcare jobs require only a certification or industry credential.²¹² To better determine staffing ratios and provider gaps, it would be useful to quantify the number of students graduating from community colleges with medical assisting or technician certificates or degrees, and where they are working.²¹³

QUANTIFYING THE WORKFORCE GAPS

Each year the New Mexico Health Care Workforce Committee, a voluntary group of experts, analyzes substantial gaps in the state’s healthcare workforce and makes recommendations for addressing the problem. The committee uses data collected by state licensure boards that include where providers practice, their status (i.e. active or inactive), demographics, education, practice activities, hours and weeks worked and future practice plans.²¹⁴

According to the committee, the healthcare workforce is well below national benchmarks for provider-to-patient ratios in many areas of the state for physicians, psychiatrists, dentists, nurses, emergency medical technicians and other providers.²¹⁵ Improvements have occurred in the number of registered nurses and physician assistants, though the shortages remain. Even if New Mexico were meeting benchmarks for providers, the committee reports that all residents still would not necessarily have adequate healthcare access. For example, the estimates do not account for: whether providers see Medicare and Medicaid patients (many do not); wait times that can range from a month or over six months for primary and specialty care; or substantial health disparities related to poverty such as access to transportation and other social determinants of health. All these challenges prevent residents from accessing services. Suggestions that New Mexico could solve its shortages by relocating providers from better-served counties to lower-served ones are not considered realistic.

ESTIMATED NUMBER OF N.M. PROVIDERS COMPARED TO NATIONAL BENCHMARKS

Provider type	Estimated number in NM	Total below national benchmark	NM counties below national benchmark
Registered nurses (RNs)	17,219	3,361	30
Emergency medical technicians (EMTs)	6,101	475	12
Primary care physicians (PCPs)	2,076	139	22
Pharmacists	2,013	257	26
Certified nurse practitioners/nurse specialists	1,379	142	18
Dentists	1,171	55	18
Physician assistants	746	119	22
Psychiatrists	332	106	26
Obstetrics and gynecology physicians (OB-GYNs)	273	31	9
General surgeons	188	14	7
Certified nurse-midwives (CNMs)	156	12	9
Licensed midwives (LMs)	48	4	4

Source: N.M. Health Care Workforce Committee, 2017

²¹² (UNM Bureau of Business and Economic Research, 2017)

²¹³ (Harrison, Jerry. NM Health Resources. Interview 2-12-18)

²¹⁴ (N.M. Health Care Workforce Committee, 2017)

²¹⁵ (N.M. Health Care Workforce Committee, 2017)

The state's shortage of physician specialists impacts families and our state's economy. For example, the state does not have a pediatric neurosurgeon. Patients and their families are sent to Denver and Phoenix for treatment. This displaces families from their support systems, costs a great deal of money, and sends dollars to competing states.²¹⁶ Physicians who want local access to specialty services decline to work in New Mexico and existing higher-income providers are recruited out-of-state.

The one exception to New Mexico's provider shortage is in dental hygiene. Each year, New Mexico higher education institutions produce more dental hygienists than can find full-time positions. The number of newly graduated hygienists who remain unemployed or underemployed means some programs risk losing their accreditation.²¹⁷ At the same time, thousands of New Mexicans need basic services dentists provide but hygienists cannot. Other states, tribal communities, and over 50 countries around the world, have established dental therapist practices to help resolve this challenge. Dental therapists are mid-level dental providers who work under the direction of dentists, and who have been shown in a global literature review to provide quality, routine dental care services in the range between a hygienist and dentist.²¹⁸ The New Mexico dental therapist proposal would capitalize on the existing hygienist workforce, using current higher education facilities and dental clinics to train and educate dental hygienists to be dental therapists, earning about \$60,000 per year.²¹⁹ The New Mexico bipartisan legislative proposal is supported by a coalition of New Mexico higher education institutions, nonprofit organizations and healthcare providers.²²⁰ The New Mexico Dental Association remains opposed to the proposal.

Workforce Demographics

Workforce planning requires analysis of three key demographics: gender, race/ethnicity and age.²²¹ These factors demonstrate whether the workforce is reflective of New Mexico's diversity, whether students from all walks of life have opportunities to enter health careers, and how many positions will open due to an aging workforce.

In comparison with New Mexico's population, our physicians are more likely to be male, while our nurse practitioners, clinical nurse specialists and physician assistants are more likely to be female.²²² Professionals in all those fields are less likely than the state's population to be people of color. Looking at these professionals, in terms of their mean age, they average late 40s to mid-50s, which essentially means New Mexico needs more younger providers in our professional pipeline.

"Of any avenue, New Mexico has to prioritize higher education if we are going to overcome the social determinants of health. All it takes is providing students the social and emotional support they need, and we can flourish!"

— Ariel Scott, MD, Family physician, Lovington, NM,
Former UNM BA/MD student

Why We Need More Healthcare Professionals: Human and Economic Costs

Workforce challenges translate to patient challenges. The day-to-day impact of New Mexico's shortage in healthcare providers means that most New Mexicans will experience gaps in services throughout all stages of their lives, with people living in rural, frontier and tribal areas encountering the problem more acutely. These gaps can mean months of waiting for a necessary appointment, a delayed diagnosis that is more difficult and expensive to treat, if at all, or a protracted arrival to an emergency department that is hours away. Ultimately, the shortage can mean the difference between life and death.

For example, many assume that pregnant women can continue to count on their community hospitals to deliver their children. However, the erosion of the availability to obstetrics services is a statewide and ongoing concern, especially in rural areas, and is a "canary in the coal mine" when it comes to assessing adequate access to

²¹⁶ (Dupont, 2018)

²¹⁷ (Harrison, 2018)

²¹⁸ (The Pew Charitable Trusts, n.d., Nash, 2013)

²¹⁹ (The Associated Press, 2017)

²²⁰ (Albuquerque Journal, Roch, Shendo, 2017)

²²¹ (N.M. Health Care Workforce Committee, 2017)

²²² (N.M. Health Care Workforce Committee, 2017)

necessary healthcare services.²²³ Rural hospitals are having difficulty recruiting and retaining at least one obstetrician and one pediatrician, a requirement for hospitals and nurse-midwives to provide delivery care. Only larger communities have the population to meet the 20 or more births per month requirement for a physician to be certified in obstetrics or pediatrics.²²⁴ Pregnant women in some communities must travel long distances, many times in at-risk state, for special monitoring, regular checkups, delivery and follow-up care all of which put themselves and their child in danger resulting in the death of one pregnant woman.²²⁵

From an economic perspective, healthcare dollars normally spent in the local community are now traveling with the patients and are spent and invested elsewhere. In addition, the lack of access to healthcare providers also affects New Mexico businesses' bottom line. Employers spend over \$255.8 billion each year due to worker absenteeism caused by illness and chronic diseases for themselves and family members and by sick employees who return to work before getting well.²²⁶ Lack of access to healthcare providers also negatively impacts our children's success in school and their academic future.

New Mexico's Behavioral Health Workforce Crisis

New Mexico mental and behavioral health providers, along with their patients, have arguably suffered most from the provider shortage. In 2013, the New Mexico Human Services Department halted funding to 15 behavioral health providers in response to allegations of Medicaid fraud. Since then, all of the providers have been cleared. During the investigations, the fiscal implications of being shut down meant that behavioral health providers had to either settle for a hefty amount or close their doors, leaving regions around the state scrambling to fill gaps in mental health and substance abuse treatment programs.²²⁷ Some clinicians lost their jobs or relocated, and thousands of patients experienced a disruption in services.²²⁸

Since that time, to attempt to ameliorate the shortage of mental health professionals, the UNM School of Medicine has established a dedicated track that helps prepare and attract psychiatry residents to practice in rural areas.²²⁹ The program spans all four years, with senior residents working at tribal clinics and community mental health centers two days a week for at least six months. Nearly 40 percent of these rural-track psychiatry residents ultimately practice in rural New Mexico, compared with 10 percent of other UNM psychiatry residents, according to a study published in 2014.²³⁰ In 2017, UNM also received a \$7 million National Institutes of Health grant to open a new behavioral health research center. The goal of the center is to make a measurable impact in preventing youth suicide, alcohol and drug misuse, and depression in vulnerable populations, while also improving access to behavioral health services and growing a diverse behavioral health workforce.²³¹

Financial Aid for Healthcare Students

Students aspiring to become healthcare professionals must contend with the cost of higher education and especially for more advanced degrees. The average medical school debt of \$166,750, repaid in 30 years at 7.5 percent interest, ultimately costs \$419,738.²³² The state offers a variety of student loan programs to help make attaining a health professions degree possible.²³³ In FY17, advanced practice nurses, clinical psychologists and other mental health providers were considered the priority professions for funding distributions. Medical professionals, dentists and allied providers also received awards. Loan-for-service and repayment programs have been shown to be the most effective in retaining health professions students in New Mexico.²³⁴ However, the

²²³ (Dye, 2018)

²²⁴ (Harrison, 2018)

²²⁵ (Matlock, 2016)

²²⁶ (Centers for Disease Control, n.d.)

²²⁷ (Public Health New Mexico, n.d.)

²²⁸ (Rashad, 2015)

²²⁹ (Weiner, 2018)

²³⁰ (Weiner, 2018)

²³¹ (Haederle, 2017)

²³² (Kristof, 2013)

²³³ (N.M. Higher Education Department, 2017)

²³⁴ (Harrison, 2018)

loans amounts have not kept pace with rising education costs.²³⁵ In addition, current loan amounts leave little if any remaining funds for students to cover housing, food and other living expenses.²³⁶

Examples of loan programs include:

- Loan for Service programs for allied health professions, medical, nursing, teaching or minority doctoral students (Allied Health is a term used to describe the broad range of health professionals who are not doctors, dentists or nurses.)
- State loan repayment programs that help students repay outstanding student loan debt
- Health Professional Loan Repayment Program (HPLRP) providing assistance for practicing health professionals in exchange for service in underserved communities including rural areas
- Western Interstate Commission on Higher Education (WICHE) loan-for-service program that reduces out-of-state tuition for New Mexico dentistry and veterinary students, since our state does not offer those degrees

The good news is that there are many eligible applicants for these programs. Unfortunately, there are not enough funds to provide awards to all eligible applicants, and the value is diminishing due to rising higher education costs. During the FY17 application cycle 29 of the 114 eligible applicants for the state loan repayment program were offered awards, which benefited 15 of the state's counties.²³⁷ For the state Loan for Service Programs, only 55 percent of eligible applicants received awards. In addition, six years ago, some loan programs generally covered 40-50 percent of costs now cover only 20-25 percent.²³⁸

Best Practices and Recommendations

Our state has available jobs, a high demand for healthcare professionals, and healthcare education and training programs, so how do we keep and bring students here fill those positions?

While it would be helpful to increase New Mexico's Medicare and Medicaid reimbursement rates and reduce restrictions on residency programs, the state has little control over these federally controlled items and this is unlikely to change.

Next, support programs and efforts that are working. For example, loan repayment programs are by far the most effective way to recruit and retain students and graduates of health professions.²³⁹ To recruit physicians, offering a 1:5 staffing ratio of physician to mid-level and allied health providers, and limiting "on call" requirements to a maximum of every third weekend can also be very effective. Healthcare services entities in New Mexico are able to successfully recruit out-of-state providers using various recruitment strategies some of which include loan repayment opportunities. For example, New Mexico Health Resources, a nonprofit healthcare recruitment agency, is able to recruit approximately 65 out-of-state providers each year using a number of strategies.²⁴⁰

NM HEALTH CARE WORK FORCE COMMITTEE RECOMMENDATIONS

The New Mexico Health Care Workforce Committee developed a number of recommendations:²⁴¹

- Support further exploration of Medicaid as an avenue for expanding residencies in New Mexico.
- Position the Higher Education Department to take full advantage of the next opportunity to reinstate the U.S. Department of Health and Human Services matching grant to support New Mexico's state loan repayment program.
- Continue funding for primary and secondary care residencies in New Mexico.
- Increase funding for state loan-for-service and loan repayment programs, and consider restructuring them to target professions most needed in rural and underserved areas rather than prioritizing those with higher debt.

²³⁵ (Harrison, 2018)

²³⁶ (Hawker, 2018); (N.M. Higher Education Department, n.d.)

²³⁷ (N.M. Higher Education Department, 2017)

²³⁸ (Harrison, 2018)

²³⁹ (Harrison, 2018)

²⁴⁰ (Harrison, 2018)

²⁴¹ (N.M. Health Care Workforce Committee, 2017)

- Request that the Department of Health add pharmacists, social workers and counselors to the health care professions eligible for New Mexico’s Rural Healthcare Practitioner Tax Credit program.
- Provide funding for the New Mexico Health Care Workforce Committee to continue its work and better identify true access gaps allowing limited funds to be better prioritized.
- Develop reimbursement mechanisms through Medicaid for services delivered by behavioral health interns in community settings.
- Expedite direct services via telehealth by participating in interstate licensing compacts when available

SUN PATH CONSORTIUM RECOMMENDATIONS ²⁴²

To strengthen, sustain, and expand college career pathways after SUN PATH TAACCCT funds expire, college and workforce leaders from across the consortium recommend the following:

1. Strengthen the focus on the critical role community colleges play in meeting the state’s workforce needs through the following state and individual college strategic plans:
 - Expand capacity to deliver additional workforce training programs at community colleges.
 - Sustain and expand the strategic partnerships among higher education, the Department of Workforce Solutions (DWS) and community and regional employers.
2. Partner with Adult Education programs to expand the Integrated Education Training (IET) model to entry-level certificates. IET programs support academically underprepared adults to obtain industry credentials in high demand occupations.
3. Embed entry level certificate programs into associate degree programs to create career pathways with stacked credentials.
4. Ensure that core industry competencies and assessments are included in academic curricula that prepare students to obtain industry recognized credentials.
5. Expand partnership/collaboration between Institutes of Higher Education and Department of Workforce Solutions (DWS), regional workforce boards, and college campuses in the following ways:
 - Continue and expand the role of Job Development Career Coaches (JDCC) on campuses to serve as a link between colleges, workforce connection offices, and regional employers.
 - JDCCs train career services staff to use workforce readiness support services including the Workforce Connections online system (WCOS).
6. Increase college student enrollment in and usage of Workforce Connections Online System (WOCS) resources.
7. Expand sector-specific employer advisory councils that meet regularly to ensure the relevance of workforce training programs.
8. Train financial aid staff and advisors to access alternative financial resources for adults who lack a high school diploma or equivalency. Examples include Workforce Innovation and Opportunity Act (WIOA), Temporary Assistance for Needy Families (TANF), or demonstrating the Ability to Benefit to receive financial aid.
9. Adopt a unified statewide career pathways system that aligns with industry sectors in the state and leverages existing resources, systems, and structures.
10. Commit resources to the alignment of courses, course numbers, and CIP codes for programs that lead to the same industry credential across institutions. (Currently, they are inconsistent and all over the map which causes much confusion for students and systems in general).

RECOMMENDATIONS FROM OTHER SOURCES

Recommendations from other sources for strengthening the health professions pipeline include the following:

- Recruit and train business and personnel managers who can implement innovative ways, beyond salary and benefits, that maintain and keep their healthcare workforce happy. Nationally, newly recruited providers stay an average of only 28 months.²⁴³

²⁴² (N.M. SUN PATH Consortium, 2017)

²⁴³ (Harrison, 2018)

- Better train health professions students in soft skills, providing more experience with patients throughout their education. This would help graduates better adjust to communities they serve and patient and providers overcome social barriers they may face.
- Better prioritize state funds so that they also support a strengthened pipeline. (e.g. State funding for buildings does not inherently translate to more providers and improved access.)
- Improve and expand marketing to students and families promoting existing health professions education programs and available funding. ²⁴⁴
- Expand the number of healthcare-focused early college high schools. As noted in Chapter 1, these schools aim to graduate students with both a high school diploma and an associate degree or credential.
- Increase New Mexico Higher Education Department (HED) funding for nursing faculty.
- Support expansion of the New Mexico Nursing Education Consortium's efforts in bringing the Bachelor of Science in Nursing (BSN) to community colleges.

FACULTY AND PRECEPTORSHIPS

Recruiting and retaining healthcare professions faculty and preceptors remains a challenge. Two options include allowing our growing number of retired or near-retired nurses and physicians to more easily earn faculty status and better compensating provider preceptors. Currently, preceptors must manage their own heavy caseloads in addition to mentoring students.

VETERANS - AN UNDERUTILIZED WORKFORCE

Better transitioning veteran military medics into civilian healthcare jobs and education programs could alleviate rural provider shortages. New Mexico is home to over 46,000 veterans between the ages of 18-54, 64 percent of whom have high school through college degrees, and many already reside in underserved rural communities. ²⁴⁵ But veterans pursuing a career in healthcare often face significant obstacles including translating military training into college credit, having to retake classes or exams to meet state credentialing requirements, and navigating veteran education benefits. ²⁴⁶ (See Chapter 1, page 4, about Credit for Prior Learning programs for veterans in New Mexico.) Similar opportunities might also exist to better transition practitioners with international degrees and credentials into healthcare jobs. ²⁴⁷

SUN PATH CONSORTIUM: A COMMUNITY COLLEGE HEALTH PROFESSIONS BEST PRACTICE

New Mexico could consider expanding the work of the New Mexico Skill UP Network Pathway Acceleration in Technology and Healthcare (SUN PATH) Consortium. Over the past three years SUN PATH, comprised of higher education and industry leaders, has developed programs throughout the state that accelerate students through community college healthcare training programs and directly into the workforce. ²⁴⁸ SUN PATH has served close to 3,400 students with over 2,300 credentials earned.

UNM PIPELINE PROGRAMS: A FOUR-YEAR COLLEGE AND BEYOND BEST PRACTICE

The University of New Mexico Health Sciences Center Office for Diversity coordinates educational pipeline programs focused on growing our own diverse healthcare workforce. These programs prepare underrepresented, underserved, and economically disadvantaged middle school through college students for health professions programs. ²⁴⁹ The programs provide health careers awareness and exploration opportunities, testing preparation and the chance to develop and hone critical thinking skills.

One of the most well-known pipeline programs is the UNM BA/MD program. Under the BA/MD program students earn a baccalaureate degree in a challenging four-year curriculum specifically designed to prepare them for

²⁴⁴ (New Mexico First, 2008)

²⁴⁵ (N.M. Department of Workforce Solutions, 2015)

²⁴⁶ (Healthcare Daily Online, n.d.)

²⁴⁷ (Baier, 2015)

²⁴⁸ (N.M. SUN PATH Consortium, 2017)

²⁴⁹ (UNM Health Sciences Center Office for Diversity, 2017)

medical school. Upon graduation eligible students transition to the UNM School of Medicine to complete their Doctor of Medicine degree.²⁵⁰ After completing their medical residency, many of these students return to practice in New Mexico.²⁵¹ (See Appendix H for a detailed listing of UNM programs.)

COLLABORATIVE PIPELINE PROGRAMS:

Our state could also look to the examples of collaborative programs in which New Mexico higher education institutions are working together, sharing and coordinating resources to strengthen the state’s healthcare workforce. Some of these collaborative efforts include:

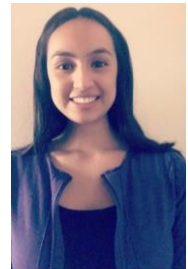
- American Indians into Nursing Collaborative Grant, which prepares nurses to practice at Indian Health Centers
- New Mexico Nursing Education Consortium, which advances a common, sustainable statewide nursing curriculum, increased numbers of bachelor and graduate nursing degrees in New Mexico, and a qualified, diverse and professional nursing workforce for rural areas
- UNM/NMSU Cooperative Pharmacy Program, which aims to increase the number of pharmacy students from southern New Mexico to practice in the region

See Appendix H for additional details on these and other healthcare pipeline programs.

Student Case Study: Preparing for a Health Career

FABIOLA PEREZ, UNM COLLEGE OF PHARMACY

Fabiola Perez’s parents instilled in her the value of education from an early age. Because of her family support, planning and initiative, today Fabiola is a first-generation graduate student at the UNM College of Pharmacy. During her undergraduate program she majored in biology with a minor in chemistry, knowing that those courses would prepare her for pharmacy school. Her career inspiration stemmed from her family’s unique challenges. “When my mom was pregnant my parents were in a car accident. My dad hurt his spine and I never saw him walk. I grew up helping my dad, and I wanted to help other people. That’s why I chose to go into healthcare.”



Fabiola chose pharmacy because she loved chemistry and has since put her passion into practice with multiple internships and volunteer positions. Though Fabiola is used to figuring things out on her own, she recalls her educators always being a great help. In high school, teachers sat down with her and helped Fabiola come up with a plan for college and connected her with scholarships. She still seeks support from campus resources and takes advantage of more tutoring now than she did before. She recommends that higher education institutions offer plenty of these types of support systems. These include: in-the-field learning opportunities, faculty that make themselves available to guide students, and scholarships specifically for underserved students.

Intersections and Conclusion

Overall, the most successful health career pipeline programs strengthen services available to New Mexicans, foster in students a robust understanding of community needs and public health, and provide students with the tools, skills, knowledge and support they need to serve communities. The chapter points out that out-of-state provider recruitment and retention efforts are also important. It may be worthwhile to consider examples from other industries, and Chapters 4 and 6 offer examples. Regarding New Mexico’s own health professional programs, this chapter offers a snapshot of good examples. (See Appendix H for more.) These programs demonstrate a marked change in how New Mexico continues to evolve math and science education. Rather than educating students that “math and science are important” these programs are making the core curriculum relevant by integrating these courses directly into a program of study that leads to a career. This content connects with important data on STEM education in Chapter 6.

Fundamentally, New Mexico’s healthcare community, educators, students and policymakers can continue to map a path toward a more robust pipeline of health professionals, enriching our lives today and tomorrow.

²⁵⁰ (UNM Health Sciences Center, School of Medicine, n.d.)

²⁵¹ (Romero-Leggott, 2018)

Chapter 6

New Mexico's Energy Workforce

Today's Strengths and Tomorrow's Needs

When it comes to the future of energy, only one thing is certain: global demand for it will continue to increase. World energy consumption is projected to grow more than 25 percent between 2015 and 2040, driven in large part by developing nations where economic growth is strong, particularly in Asia.²⁵² The composition of energy resources that will meet demand is less certain. More than 40,000 New Mexicans work in “traditional energy” (electric power generation and fuels, as well as transmission, distribution and storage).²⁵³ At 5 percent of New Mexico’s total employment, the state’s proportion of traditional energy jobs is more than twice that of the nation. Another 4,500 work in energy-efficiency programs within the construction sector.²⁵⁴

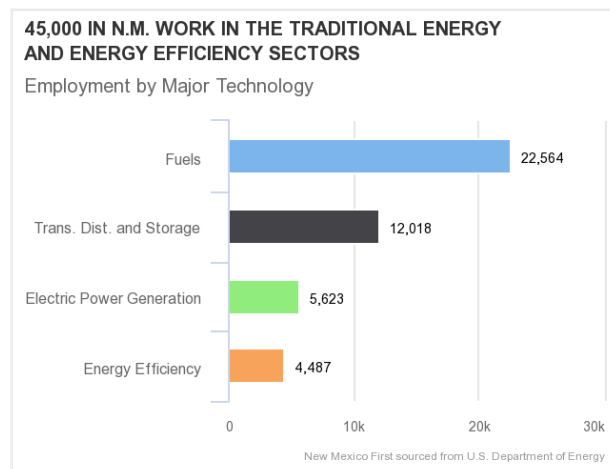


Figure 19: New Mexico energy jobs by technology, 2017

“New Mexico, being a natural-resource state, has basically every energy resource in abundance except for tidal energy,” said Anne Jakle, associate director of New Mexico EPSCoR, when interviewed for this report. “We are always going to be well-poised to take advantage of whatever our society chooses as its energy sources.”²⁵⁵

But, Jakle warned, New Mexico’s unique opportunity to lead the nation in both conventional and alternative energy can be lost if we fail to act boldly. Energy discussions often focus on *financial* capital investments, such as expanded transmission of both renewable and convention energy. However, investments in *human* capital through education and training are equally urgent to New Mexico’s energy future. **This chapter describes energy workforce issues in New Mexico, including an overview of industry changes.**

KEY CONSIDERATIONS

Given the difficulty of predicting energy markets, how does New Mexico adequately impart high-value skills that enable workers to be adaptive among various energy jobs? How can colleges and universities prioritize recruitment and retention of well-qualified faculty with energy expertise? What science, technology, engineering and math (STEM) courses do future energy professionals need, and do New Mexico schools offer them? And how can we increase the number of overall STEM graduates? Like in other fields, young students often do not know about the range of certificates and degree programs available. How can we expand education partnerships in rural and tribal communities, where most of the energy jobs exist?

More Energy Jobs Rely on STEM Education and Training

The energy economy creates direct and indirect jobs. For example, the numbers of construction jobs created by renewable energy projects are often many times more than the permanent positions. Similarly, oil and gas operations are indirectly supported by the specialized knowledge of accounting professionals and attorneys. From battery researchers at the national labs to oil field workers in the Permian Basin – or from windmill managers in eastern New Mexico to uranium enrichment operators in Lea County – many options exist. The types of jobs

²⁵² (U.S. EIA, 2017)

²⁵³ (U.S. DOE, 2017)

²⁵⁴ (U.S. DOE, 2017)

²⁵⁵ New Mexico EPSCoR (Experimental Program to Stimulate Competitive Research) is an organization “building the state’s capacity to conduct scientific research and cultivating a well-qualified STEM workforce, while supporting a culture of innovation and entrepreneurship,” according to its website.

associated with energy, directly and otherwise, are too varied to fully cover in this chapter. But technology drives them all, so STEM education is more important than ever. (See Appendix I for related career information.)

HIGHER EDUCATION AND STEM

About 20 percent of all American jobs are in STEM fields, with half open to workers who do not have four-year college degrees, according to the Brookings Institution.²⁵⁶ STEM knowledge offers attractive wage and career opportunities to many workers with a postsecondary certificate or associate degree.²⁵⁷ An estimated 80 percent of all jobs in the next decade will require STEM skills, most needing some level of college or training.²⁵⁸ Significant attention has been devoted in recent years to increasing the number of college graduates with STEM degrees, and there has been steady progress in New Mexico.²⁵⁹ College and university courses that align education with STEM job openings will continue to be critical to changing workforce needs, particularly in energy. The following treemap chart illustrates the volume of STEM, energy and information tech completions at the certificate, associate, bachelor’s, master’s and doctoral levels at New Mexico institutions of higher education.

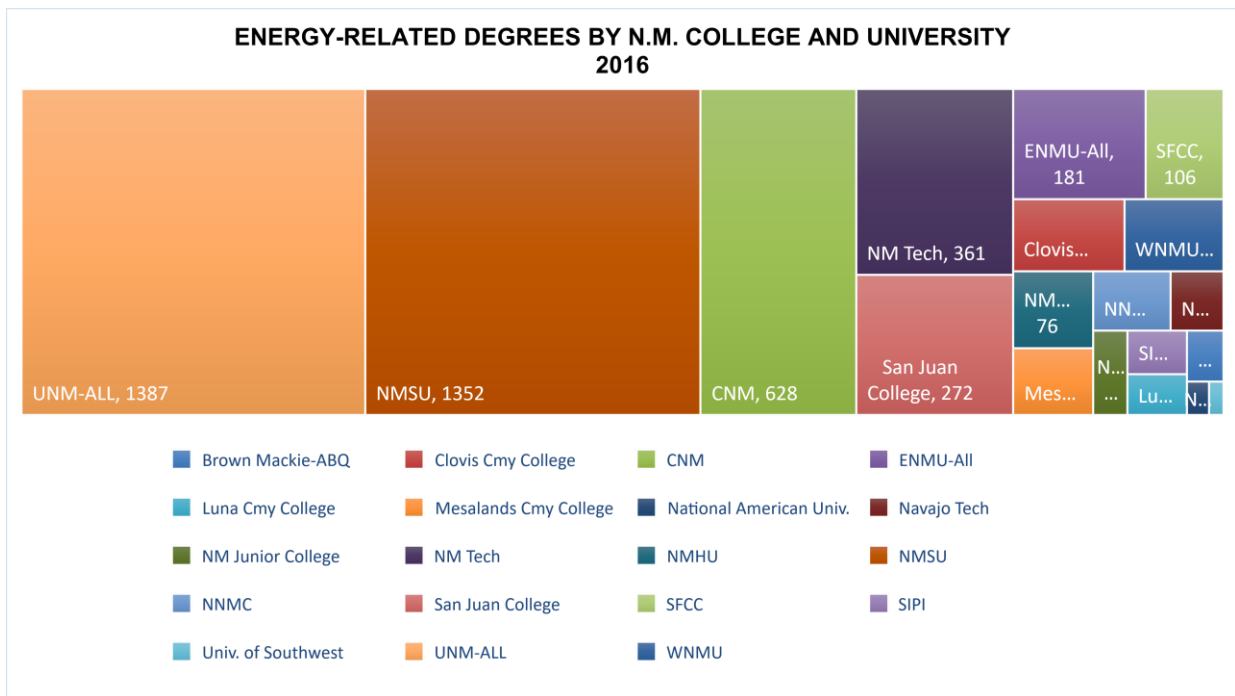


Figure 20: Treemap of Energy-Related Degrees, N.M. (National Center for Educational Statistics, 2017)

In 2016, a combined total of 4,869 STEM and energy degrees were awarded, including certificates.²⁶⁰ Figure 22 shows the breakdown of total STEM degrees awarded, all majors combined. Figure 21 lists energy-related degrees (including credentials) by major field of study at higher education institutions in New Mexico. These broad categories are comprised of dozens of detailed degree specialties.

²⁵⁶ (Rothwell, 2013)
²⁵⁷ (Koebler 2010)
²⁵⁸ (Georgetown 2016), (American Council on Education, 2010)
²⁵⁹ (N.M. Higher Education Department, 2014)
²⁶⁰ (National Center for Educational Statistics, 2017)

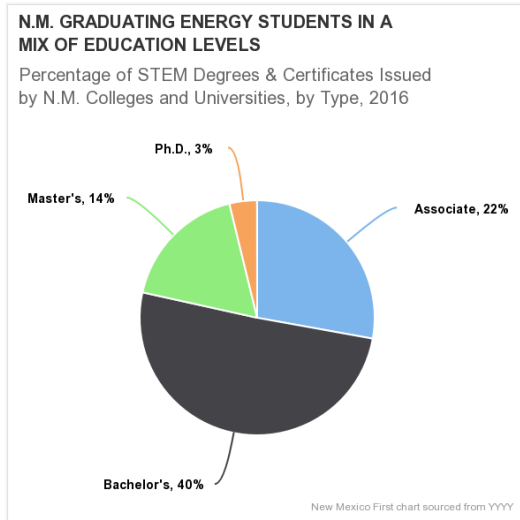


Figure 22: Percentage of STEM degrees by type

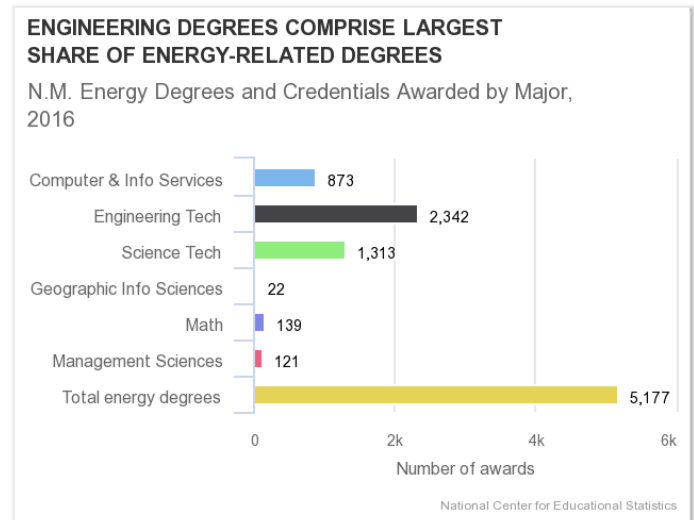


Figure 21: Number of energy degrees awarded in N.M., 2016

RECRUITING STEM MAJORS

The best way to recruit STEM majors is to engage them when they are young. That can be in middle or high school. Or, higher education institutions deploy various tools to recruit students to STEM fields, such as targeting undeclared majors and reaching out to students during their first two years of college.

For example, the National Science Foundation funded a pilot program at the University of Central Florida to recruit STEM majors from the entering freshman class. Using SAT scores, the school determined which freshmen appear to have potential to do well in science or math. Then the school inundated them during their first semesters with STEM career information.²⁶¹ Beyond the pilot program, all entering UCF students are encouraged to take a career planning course that includes information on STEM jobs.

RETAINING STEM MAJORS

In addition to recruiting students to STEM degrees, colleges and universities must hold on to them. Nationally, fewer than 40 percent of students who enter college intending to major in a STEM field complete a STEM degree.²⁶² Completion rates are even lower for women and minorities. Courtney Puryear, a faculty member at New Mexico Junior College (NMJC) said the school's Energy Technology Program was able to reduce student withdrawals by updating the curriculum to require college algebra. "Now that there is a prerequisite," Puryear said, "I don't see many drop outs because they are able to keep up with the required math in the program."

INDUSTRY ROLE IN HIGHER EDUCATION

Companies in New Mexico have every reason to help increase the number of STEM graduates. There are many industry-related strategies for increasing the number of STEM graduates. Some examples include:

- **Internships:** Each year, Sandia National Laboratories provides internships and related hands-on learning opportunities to hundreds of students from around the country, from high schoolers to researchers obtaining Ph.D.'s.²⁶³ Santa Fe Community College also offers internships, and faculty members Stephen Gómez sees them as the college's best STEM retention tool. Gómez said his students who intern have a greater likelihood of graduation, and internships inspire many students to pursue higher degrees than they first intended.
- **Donated technology:** Businesses can donate equipment to colleges to provide more hands-on experiences. For example, oilfield company Basic Energy Services donated a rebuilt pulling unit to NMJC to give students

²⁶¹ (University of Central Florida, 2012)

²⁶² (President's Council of Advisors on Science and Technology, 2012)

²⁶³ (Sandia National Laboratories) Sandia National Laboratories. http://www.sandia.gov/careers/students_postdocs/internships/

hands-on training in oilfield activities. (A pulling unit is a mechanical device to remove the casing, tubing apparatuses or drilling rods inside a wellbore.)

- **Curriculum development:** Industry can work with academia to develop materials, industry-specific courses, or serve on advisory groups, such as the Dean’s Advisory Council for the College of Engineering at NMSU.²⁶⁴ These strategies can enhance the rigor and relevance of students’ coursework.

Energy Roadmap²⁶⁵

In 2017, the New Mexico Energy, Minerals and Natural Resources Department (EMNRD), in partnership with New Mexico First and with U.S. Department of Energy grant funding, tapped the expertise and dedication of over 70 energy stakeholders to create a consensus-driven, 10-year “New Mexico Energy Roadmap.” The roadmap’s purpose is to strengthen and diversify the state’s energy economy and make it resilient to global changes.

In a four-part series of steering-committee meetings, participants identified 15 goals and accompanying strategies that touch virtually all conventional and renewable energy industries in New Mexico. The work addresses:

- Energy economy diversification
- Moving energy
- Transportation
- Energy efficiency
- Workforce and education

Regarding workforce and education, the Energy Roadmap outlines three key goals:

- By 2020, better align education and training programs at New Mexico’s two- and four-year colleges with current and future energy workforce needs.
- Through a public-private partnership, create energy career outreach program that reaches 15,000 students annually.
- Remove barriers for New Mexico students to enter energy training programs, such as through financial aid.

(See Appendix I for the Energy Roadmap’s list of concrete strategies to support these goals.)

N.M. Energy Resources: History and Projections

A discussion on the alignment of New Mexico’s workforce with the state’s energy industries requires a snapshot of current and projected energy activities. Informing the discussion with recent history may be just as important, because doing so provides a sober reminder that energy markets can vacillate wildly, creating and shedding jobs with them. There are at least four energy sectors in New Mexico that create (or lose) jobs, all that potentially benefit from close cooperation with higher education systems: oil and gas, renewables, uranium and coal.

OIL AND NATURAL GAS

In the span of 10 years, oil and gas companies in New Mexico experienced significant ups and downs due to geopolitics and changes in technology, all of which influenced the industry’s impact on state budgets and its hiring needs. To consider the types of higher education programs the industry may require now or in the future, it is useful to quickly overview its recent past.

By the first half of 2008, the spot price of crude oil surpassed \$130 per barrel, a record high, fueled by a combination of cheap credit, price speculation and growth in countries like China and India. With the collapse of global financial markets in the ensuing months, oil prices fell to below \$40 per barrel by February of 2009.²⁶⁶ The same thing occurred with natural gas, which peaked at more than \$8 per mcf (thousand cubic feet), and then fell

²⁶⁴ (New Mexico State University)

²⁶⁵ (EMNRD, 2018)

²⁶⁶ (O’Brien, 2008); (U.S. EIA, WTC, citing Thomson Reuters, 2018)

precipitously with the financial collapse.²⁶⁷ As oil prices began their recovery in 2009, the price of natural gas stayed behind, due to an elevated supply caused by a fairly new technique of combining horizontal drilling with hydraulic fracturing.²⁶⁸ Deployment of the technique nationally led to the United States becoming the world's top producer of natural gas in 2011 and holding that status ever since.²⁶⁹ These techniques – which are highly controversial in some New Mexico communities and embraced in others – unlocked previously untapped oil reserves in southeastern New Mexico. In the following years, the rapid expansion of shale-oil production – coupled with changes in federal export regulations – meant that the United States was the world's top fuel exporter in 2016 and 2017.

New Mexico appears to have emerged from the last downturn, having become the third-largest U.S. oil producer, but doing so was not without its costs.²⁷⁰ In addition to production efficiencies described above, companies deployed a host of cost-cutting measures to weather low oil prices, from consolidating offices to using remote-control and automation technologies, both of which have meant laying off workers.²⁷¹ In fact, despite vast oil production not seen in decades, there are 50,000 fewer people working in oil and gas extraction nationally since the last boom's peak.²⁷²

Lea County, for example, saw jobs in support activities for oil and gas extraction (those not directly involved in drilling and often requiring a commercial driver's license) cut by almost half during the downturn, as seen in Figure 23. And while record oil output is generating much-needed revenues for the state's general fund and permanent funds, it is apparent more oil can be produced with fewer workers than before the last downturn.²⁷³

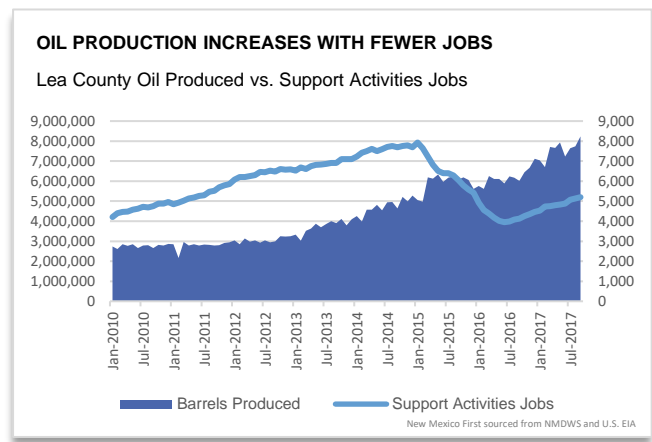


Figure 23: Oil production has reached record levels, but jobs lost before the last downturn have not rebounded.

Technological advances, such as autonomous drilling rigs and drones are taking the place of many oilfield jobs, but that also means that new high-tech, high-skill jobs are being created. Today, workers with at least a bachelor's degree account for more than half of the jobs gains in the industry, a shift driven by the demands for more skilled workers to operate the more advanced technology in oil and gas exploration, production, processing and transportation.²⁷⁴ "Potential employees who hold a degree are more marketable and tend to stick with companies longer," said Courtney Puryear of NMJC. Both NMJC and San Juan College offer certificate and Associate of Applied Science programs that emphasize oil and gas industry-specific training. The website College Choice ranked New Mexico Tech's petroleum engineering program first among 20 universities with well-known energy programs.²⁷⁵

Barring unforeseen changes, the greatest share of the worldwide energy mix is expected to consist of fossil fuels for the next 10 years despite widespread concerns about climate change.²⁷⁶ These realities mean that the oil and gas industry will continue to create revenues and jobs in New Mexico.

²⁶⁷ (U.S. EIA, natural gas, 2018)

²⁶⁸ (Geology.com)

²⁶⁹ (U.S. EIA, 2016)

²⁷⁰ (U.S. EIA)

²⁷¹ (Benton, 2016); (Robinson-Avila, 28 Aug. 2017); (Mose, 2018)

²⁷² (U.S. BLS, 2018)

²⁷³ (Robinson-Avila, 11 Aug. 2017); (U.S. EIA, 2017); (Robinson, 2018); (N.M. State Land Office, 2017) Note: More than 90 percent of the state's \$16 billion Land Grant Permanent Fund, which benefits public schools, public universities and hospitals, has been derived from lease and royalty payments from oil and gas operations on State Trust Lands.

²⁷⁴ (Georgetown, 2016)

²⁷⁵ (College Choice) Texas A&M University, 4; Texas Tech University, 11; the University of Tulsa, 12; the University of Oklahoma, 14; and the University of Houston, 15. The rankings are based on a number of factors, including student surveys, graduate success rates, and other publicly available data.

²⁷⁶ (Collins 2018); (U.S. EIA)

RENEWABLE ENERGY

Of the 5,623 New Mexico workers in electric power generation, 70 percent worked in solar electricity generation, and another 18 percent worked in wind. Based on economic trajectories of current energy resources, the U.S. Energy Information Administration (EIA) estimates U.S. power generation from renewables will more than double between 2017 and 2050, primarily via wind and solar, with an average annual growth rate of 2.8 percent.²⁷⁷ PV solar generation is projected to reach 14 percent of total electricity generation by 2050, with 53 percent of the total from utility-scale systems.

New Mexico is substantially rich in renewable energy resources, particularly wind and solar. In 2016, about 11 percent of in-state electricity production came from wind turbines.²⁷⁸ New Mexico ranks 15th among states for both installed electricity-generating capacity and number of wind turbines, with just over 1,000 wind turbines generating 1,700 megawatts.²⁷⁹

Electric utility Xcel Energy has proposed adding nearly one-third more capacity with the \$865-million Sagamore Wind Project planned for 150,000 acres in Roosevelt County.²⁸⁰ Unanimously approved by the state Public Regulatory Commission (PRC) in March 2018, the 522-megawatt wind farm will power 194,000 homes.²⁸¹ Sagamore will create up to 300 construction jobs and more than two dozen full-time jobs.²⁸²

Solar power provided about 3 percent of the state's generation in 2016.²⁸³ In 2016, New Mexico ranked 15th in the nation in installed solar capacity with about 700 megawatts, and additional utility-scale solar photovoltaic (PV) facilities are being developed. New Mexico's largest PV solar project to date is the \$260 million, 1,400-acre Roswell and Chaves County Solar Energy Centers, built by NextEra Energy Resources.²⁸⁴ The facilities can generate a combined 140 megawatts, enough to power more than 40,000 homes. Through a 25-year contract, Xcel Energy will purchase electricity from the facilities for its New Mexico and Texas customers. In line with the latest estimate that utility-scale solar systems create two installer jobs per megawatt, the facilities created about 300 jobs during construction and five permanent jobs.²⁸⁵

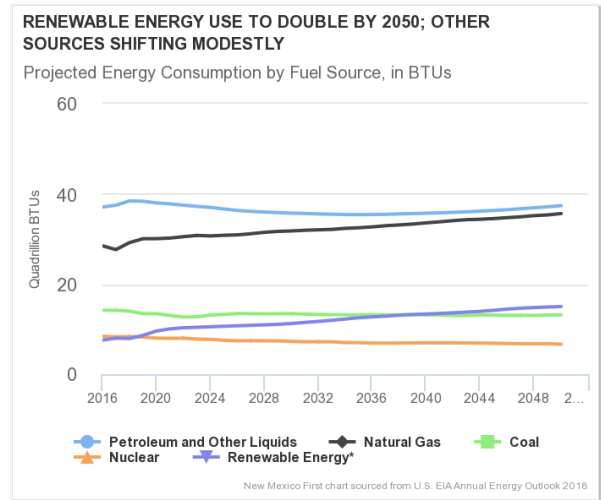


Figure 24: Forecasted energy use by source, through 2050

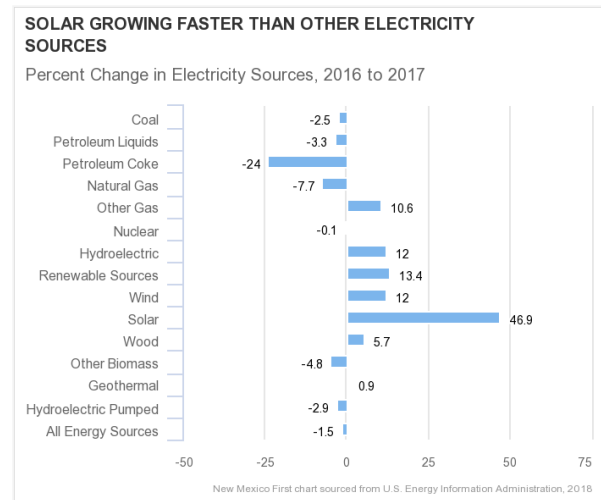


Figure 25: Where Americans got their electricity, percent change from 2016-2017

²⁷⁷ (U.S. EIA, 2018)

²⁷⁸ (U.S. EIA)

²⁷⁹ (American Wind Energy Association, 2017)

²⁸⁰ (Sapin, 2017)

²⁸¹ (Sapin, 2017), (Xcel Energy, 2017)

²⁸² (Stelnicki, 2017)

²⁸³ (U.S. EIA)

²⁸⁴ (Hayden, 2016)

²⁸⁵ (The Solar Foundation, 2017)

About two-thirds of states use more electricity than New Mexico, and the Land of Enchantment produces more electricity than it uses.²⁸⁶ Thus, New Mexico is a net supplier of electricity to neighboring states. With so much renewable energy potential, and with demand for low emissions energy increasing, New Mexico has a tremendous opportunity to sell more electricity to other states. What’s needed is more transmission capacity to carry the power to other locations. Multiple projects are underway to attempt to address this need.

Among the economic-base jobs New Mexico economic developers and others have tried to lure to the state are those in solar manufacturing. Starting in 2009, Schott Solar employed 250 Albuquerque-area workers for PV panel fabrication, but the plant closed in 2012, amid growing competition from low-cost Chinese panel producers.²⁸⁷ Most manufacturing of solar panels, as well as wind turbines, requires rare-earth metals, of which China produces 85 percent, and Chinese manufacturers do not face the same kinds of environmental rules, such as those relating to the disposal of toxic wastewater, as their U.S. counterparts.²⁸⁸ Today, China produces two-thirds of the world’s solar panels, as well as half of the world’s wind turbines.²⁸⁹

Another notable resource in New Mexico’s renewable portfolio is geothermal energy, a process of utilizing hot water below the ground to operate an electricity-generating turbine. In late 2013, Cyrq Energy Inc. began supplying 4 megawatts of electricity to Public Service Company of New Mexico (PNM) with its Lightning Dock geothermal plant near Animas.²⁹⁰ Construction of the \$43 million facility called for 100 construction jobs and eight full-time jobs when it became operational.²⁹¹ Cyrq Energy announced in fall 2017 that it would be undertaking a \$50 million expansion of the facility, essentially doubling its capital investment, to provide 10 megawatts.²⁹²

Degree programs at New Mexico community college provide training in these areas. Santa Fe Community College offers a certificate program in solar energy, preparing students to “design, plan, install and troubleshoot photovoltaic solar electric energy systems.” Students in Navajo Technical University’s Energy Systems program learn the “fundamentals of electricity, magnetism, photovoltaic electrical systems, and wind generation.” Central New Mexico Community College also offers a concentration in photovoltaic installation in its electrical trades certificate program. And at Mesalands Community College in Tucumcari, the wind technology program offers real-world experience through certificate and degree programs. Outside the classroom, Tucumcari students are able to conduct troubleshooting, preventive maintenance and repairs on an actual 1.5-megawatt wind turbine.

NUCLEAR ENERGY

There are at least four ways nuclear energy potentially affects New Mexico’s workforce: uranium mining (currently halted statewide); uranium enrichment (currently underway in the southeast corner of the state); storage of nuclear waste materials (currently underway outside Carlsbad); and power production via small modular nuclear reactors (proposed projects). All these activities spark a mix of support, challenges and controversy.

Regarding **mining**, nearly one-third of all U.S. uranium resources exist within New Mexico’s boundaries. However, virtually no ore has been mined in the state since 1990, due in part to lower ore prices and primarily to environmental issues, such as groundwater contamination and serious health impacts.²⁹³ Currently, about 89 percent of the uranium delivered to U.S. nuclear power plants comes from other countries.²⁹⁴ Some people advocate that more uranium come from inside U.S. borders – and New Mexico in particular – while others point to past environmental and health hazards and thus oppose a return to uranium mining in the state. At least one major effort is underway: Energy Fuels Inc., the largest U.S. uranium producer, acquired the Roca Honda Project near New Mexico’s Mt. Taylor.²⁹⁵ If approved, the project would produce as much as 25 million pounds during a

²⁸⁶ (U.S. EIA)

²⁸⁷ (Robinson-Avila, 2012)

²⁸⁸ (Bradsher, 2013), (Nunez, 2014)

²⁸⁹ (Pham, 2017)

²⁹⁰ (Villagran, 2014)

²⁹¹ (The Grant County Beat, 2014)

²⁹² (D’Amassa, 2017)

²⁹³ (N.M. Energy, Minerals and Natural Resources Department), (Ulmer-Scholle)

²⁹⁴ (U.S. EIA)

²⁹⁵ (Energy Fuels Inc., 2016)

nine-year mine life and employ up to 250 people.²⁹⁶ The project is in the permitting and regulation phase, with a decision expected in 2019.²⁹⁷

Regarding **uranium enrichment**, New Mexico's Lea County is home to the nation's only uranium-enrichment plant. The centrifuge-based plant, URENCO USA, began operations in June 2010 and now produces enough enriched uranium to fuel over 6 percent of the total U.S. demand for electricity. URENCO USA employs approximately 230 full-time employees and 100 contractors. Many of URENCO USA's initial hires in operations were within the U.S. nuclear power industry or directly from the U.S. Navy's nuclear program, with about 350 permanent positions.²⁹⁸ Higher education and other workforce training programs were established in New Mexico to prepare residents to perform many of the URENCO jobs. Through outreach and programming with local colleges and universities, an internship program, and in-house training programs, local residents have become primary candidates for future employment. Today, the company reports that 70 percent of hires are local residents.²⁹⁹

The nuclear enrichment industry experiences ups and downs that potentially affect workforce needs. Demand for URENCO USA's product steadily increased until March 2011, when an earthquake-induced tsunami overwhelmed the Fukushima Daiichi Nuclear Power Plant in Japan.³⁰⁰ Japan shut down its nuclear fleet of 54 reactors, which represented about 13 percent of the world's nuclear energy-generating capacity.³⁰¹ Shortly thereafter, Germany pledged to phase out its reliance on nuclear power by 2022.³⁰² Since then, Japan has brought a handful of reactors back online, and another 12 are expected to be operational by 2025.³⁰³

In an interview with the *Hobbs News-Sun*, Helmut Engelbrecht of URENCO USA's parent company, expressed his opinion that within years, society will overcome the "consequences of Fukushima" and growth in the nuclear industry will resume. URENCO USA is licensed to further expand the site if market conditions improve and, with a license change, could enrich uranium to support new nuclear technologies like accident-tolerant fuels and small modular reactors. The U.S. Energy Information Administration (EIA) estimates in its 2017 International Energy Outlook that nuclear power will be the world's second fastest growing source of energy (after renewables), with consumption increasing by 1.5 percent per year between 2015 and 2040.³⁰⁴ If these projections are accurate, there are potential workforce implications for New Mexico.

Regarding **storage of nuclear waste**, the Waste Isolation Pilot Plant (WIPP) outside Carlsbad is the nation's only underground repository for the permanent disposal of radioactive items that are part of the nation's nuclear defense program.³⁰⁵ Operating since 1999 and regulated by the U.S. Department of Energy, WIPP employs 1,100 people.³⁰⁶ About 12 miles north of the WIPP site, between Carlsbad and Hobbs, a new effort is being led by the Eddy-Lea Energy Alliance to create a facility to house spent nuclear fuel rods (a waste product from commercial nuclear power production).³⁰⁷ The Nuclear Regulatory Commission announced in March 2018 that it will begin reviewing the interim-storage plan, which aims to store the country's entire backlog of spent fuel in 10,000 subsurface canisters on 288 acres.³⁰⁸ After a multi-year review process, if the NRC approves the controversial facility's 40-year license, the company has said the project would require approximately \$2.4 billion in capital investment and create about 150 permanent jobs. The facility could begin operations as early as 2022.

Regarding **production of nuclear power**, several companies are interested in manufacturing small modular reactors (SMRs). These nuclear-fueled power plants produce no greenhouse-gas emissions and can be used in

²⁹⁶ (Energy Fuels Inc., 2016); (Strathmore Resources, 2016)

²⁹⁷ (Mining Weekly, 2018)

²⁹⁸ (Allen, 2014)

²⁹⁹ (Sexton, 2018)

³⁰⁰ (World Nuclear Association, 2017)

³⁰¹ (Silverstein, 2017); (Sexton, 2017)

³⁰² (World Nuclear Association, 2017)

³⁰³ (Silverstein, 2017)

³⁰⁴ (U.S. EIA, 2017)

³⁰⁵ (U.S. Department of Energy, 2017)

³⁰⁶ (U.S. DOE, 2017)

³⁰⁷ Once the fuel used in a nuclear reactor's fission process is "spent," the byproduct is highly radioactive material. Spent fuel rods currently reside at nuclear-power facilities across the country, because there is no permanent solution for their disposal or reuse. (Heaton, 2018)

³⁰⁸ (Hayden, 2017)

remote areas with limited water, such as New Mexico.³⁰⁹ A 2016 study investigated the feasibility of deploying SMRs in New Mexico, concluding that doing so would create economic benefits to the state, including construction and operations jobs and significant property-tax revenues for the region where a plant is located. On the downside, the report pointed to high capital costs, regulatory burdens and use of water.³¹⁰ As yet, no SMR has been licensed or constructed in the U.S.

It is not the intent of this paper to endorse or oppose this mix of activities related to nuclear energy; those decisions are for the people and policymakers of New Mexico – as well as federal regulators. However, the volume of current and potential activities points to possible workforce implications and future requests to higher education systems.

Currently, academic programs include NMJC's nuclear emphasis in its energy technology certificate and Associate of Applied Science programs.³¹¹ The program combines radiological handling, which had previously been specific to WIPP, and nuclear technology, which can prepare technicians working for URENCO USA. The University of New Mexico (UNM) offers the only degree-granting nuclear engineering program in the state, as well as surrounding Southwest states.³¹² The website College Choice ranked UNM 20th out of 25 universities with nuclear engineering programs. Massachusetts Institute of Technology (MIT) topped the list.

COAL

Coal is most abundant in northwest New Mexico's San Juan Basin, supplying two coal-fired power plants in the area for decades, but both coal production and electricity generation from coal are on the decline.³¹³ In order to comply with federal environmental regulations, as well as an agreement with the PRC, PNM shut down two of the four units at the San Juan Generating Station in late 2017, with a commitment to shut down the other two by 2022.³¹⁴ Local leaders estimate there will be a loss of at least 650 direct jobs at the San Juan Generating Station and the San Juan Coal Company, along with almost 1,000 indirect jobs that are related to the plant and mine.³¹⁵ Four years earlier, the Four Corners Power Plant, owned by Arizona Public Service Co., shut down three of its five units for similar reasons.³¹⁶ Navajo Mine, owned by the Navajo Nation, is the sole supplier of the Four Corners Power Plant and employs approximately 350.³¹⁷

As U.S. coal demand for electric utilities shrinks, replaced largely by natural gas and renewables, community and tribal leaders in the San Juan Basin region have investigated other economic opportunities for coal reserves. Getting the coal to other markets, such as the European Union, Mexico or Asia is difficult due to transportation and other barriers.³¹⁸ Coal's decline in the region is one reason area stakeholders are exploring other assets for job creation. The San Juan Basin has significant natural gas reserves. Efforts are underway by Four Corners Economic Development Inc. and others to recruit petrochemical and plastics manufacturers that could use natural gas in their manufacturing processes.³¹⁹

Successfully transitioning many workers from coal mining and coal-based utility power production will depend greatly on the collaborative intervention of many community organizations. Partners will likely include local higher education institutions and the local office of the Department of Workforce Solutions, which provides dislocated worker services. (See Chapter 4.)

³⁰⁹ (Holtec International)

³¹⁰ (N.M. Energy, Minerals and Natural Resources Department, 2016)

³¹¹ (Economic Development Corporation of Lea County)

³¹² (Robinson-Avila, 2015)

³¹³ (U.S. EIA, 2017)

³¹⁴ (Paskus, 2018)

³¹⁵ (Four Corners Economic Development Inc., 2017)

³¹⁶ (Ringle, 2013)

³¹⁷ (Smith, 2017)

³¹⁸ (EMNRD, 2015)

³¹⁹ (Unsicker, 2018)

Student Case Study: Excelling in STEM

DERRICK PLATERO, GEOSCIENCES, NEW MEXICO STATE UNIVERSITY



Derrick Platero, a first-generation college student, grew up in Farmington with a passion for understanding physics. Derrick had not considered college until 13 years after his high school graduation when his fast-food management career stalled. He began his higher education journey at San Juan College, and from there was eager to learn what other opportunities were available. Engaging in student clubs such as SACNAS – the Society for Advancement of Chicanos/Hispanics and Native Americans in Science – opened new possibilities for Derrick. Through SACNAS, Derrick was able to attend national science conferences where he presented research and networked with STEM professionals. His fellow students in SACNAS encouraged and supported his interests.

When he moved on to NMSU to pursue a degree in geosciences, he again relied on student groups to help ease the transition to a new community and the rigors of a new school. Ultimately, Derrick was one of a handful of undergraduate students selected for the 2016 EPSCoR STEM Advancement Program. Derrick recommends that students get involved on campus, engaging with other students and faculty from the start. This engagement will help students take advantage of the emotional and financial resources that are available that can open new doors and opportunities.

Intersections and Conclusion

For a number of reasons, each New Mexican's awareness of energy development in the state can vary from another's. This chapter's extensive review of the state's energy resources and their respective phases of development is meant to illuminate where there are opportunities and challenges, compelling workforce shifts within respective energy fields. These issues impact higher education.

New Mexico's exceptional diversity and abundance in energy resources provide opportunities in job creation, funding of government and education services, and overall economic prosperity. New Mexico's profile as a major contributor to the energy economy could support recruitment of students to the state for world-class energy degree programs. In a career-pathways context, how might industry changes influence the degree choice of a young person interested in energy? How can New Mexico provide the right types of academic programs for a rapidly changing energy landscape, so that the state does not miss out on opportunities as they arise.

The issue in this chapter are not unlike those in Chapter 5 on New Mexico's healthcare workforce, and the information presented in STEM education ties to almost all sectors of the state's economy (see Chapter 4). Future planning for New Mexico's energy workforce will require coordination among educators, industry leaders, policymakers, students and community members.

Appendix

Appendix A: Institutions of Higher Education and their Governance

TABLE: HIGHER EDUCATION INSTITUTIONS ESTABLISHED BY STATE CONSTITUTION

Institution	Qualified Electors or Regents	Student Board members	Highest Degree Level Awarded	Institution Type
University of New Mexico	6	1	Ph.D.	Research
New Mexico State University	4	1	Ph.D.	Research
New Mexico Highlands University	4	1	Master's	Comprehensive
Western New Mexico University	4	1	Master's	Comprehensive
Eastern New Mexico University	4	1	Master's	Comprehensive
New Mexico Tech	4	1	Ph.D.	Research
Northern New Mexico College	4	1	Bachelor's	Comprehensive

TABLE: BRANCH COMMUNITY COLLEGES

Institution	Advisory Board	Highest Degree Level Awarded
Eastern New Mexico University – Roswell	5	Associate
Eastern New Mexico University – Ruidoso	5	Associate
New Mexico State University – Alamogordo	5	Associate
New Mexico State University – Carlsbad	5	Associate
New Mexico State University – Dona Ana	6	Associate
New Mexico State University – Grants	5	Associate
University of New Mexico – Gallup	4	Associate
University of New Mexico – Los Alamos	5	Associate
University of New Mexico – Taos	5	Associate
University of New Mexico – Valencia	5	Associate

TABLE: NEW MEXICO INDEPENDENT COMMUNITY COLLEGES

Institution	Board Members (elected)	Highest Degree Level Awarded
Clovis Community College	5	Associate
Central New Mexico Community College	7	Associate
Luna Community College	7	Associate
Mesalands Community College	5	Associate
New Mexico Junior College	7	Associate
San Juan College	7	Associate
Santa Fe Community College	5	Associate

Appendix B: Degree Types and Completions

TABLE: TYPES OF DEGREES AND CREDENTIALS (DETAILED)

Credential	Examples of Majors	How Long	Notes
Associate of Arts (AA)	Business, criminology, early childhood education, hospitality and tourism, graphic arts	2-3 semesters	An AA degree is primarily designed to prepare a student to transfer to a bachelor's program. At least 50 AA majors are offered from N.M. community colleges.
Associate of Science (AS)	Biotechnology, chemistry, engineering, mathematics, pre-health science,	2-3 semesters	An AS degree is designed to prepare a student to transfer to a bachelor's degree program in a technical, medical or professional field. At least 13 AS majors are offered at N.M. community colleges.
Applied Associate Degrees	Computer programming, culinary arts, heating and air conditioning, paralegal, wind energy, fashion design, gallery management, geospatial information technology	2-3 semesters	Unlike the AA or AS, the <i>applied</i> associate degrees are not intended to transfer to a bachelor's degree program. These are "career" degrees for students who plan to enter the workforce in a specific occupation right away. At least 60 applied associate majors are offered at N.M. community colleges.
Apprenticeships	General trades, electrical, carpentry, iron working, plumbing, sheet metal, welding	3 to 5 years	Apprenticeships are blocks of courses generally offered in conjunction with trade organizations. For example, an electrical apprenticeship to become a licensed, union, Journeyman Wireman requires five years, during which students earn wages for on-the-job training. ³²⁰ A registered apprenticeship program can increase lifetime earnings by \$240,000. ³²¹
Certificate of Completion	Automotive technology, bookkeeper, carpentry, dental assistant, film crew technician, optical lab technology	1-2 semesters	A certificate of completion, on its own, does not create a college degree. It prepares people to enter specific occupations or upgrade workplace skills. For example, a film crew certificate requires 28 credit hours ranging from production, make-up and sound.
Certificate of Achievement	Brewing technology, community health worker, firefighter, home health aide, truck driving	1 semester or less	A certificate of achievement, on its own, does not create a college degree. It prepares students to enter specific occupations or upgrade workplace skills. For example, a truck driving certificate from CNM can be completed in 14 credit hours that include in-class and highway coursework.
Bachelor's Degrees	Wide array of over 200 subjects in New Mexico, from architecture to zoology	4 years	Students may enter a bachelor's program directly or after completing an associate degree. Many, but not all, programs can be completed in 120 credit hours.
Graduate Degrees	Wide array of over 100 master's and doctoral programs	2-5 years	Students must first complete a bachelor's degree before beginning a graduate program.
Professional Degrees	Medicine, engineering or law	3-7 years	These specialized advanced degrees focus on specific careers, such as physicians or attorneys.

*Community college degree options drawn from CNM, CCC, Mesalands, NMJC, SJC, SFCC and SIPI. Not all colleges distinguish between types of certificates in their materials. The time to complete a degree is based on 15 credits a semester, but students often do not take that course load.

³²⁰ (N.M. Joint Apprenticeship and Training Committee; Associated Builders and Contractors of N.M.)

³²¹ (U.S. Congress, Joint Economic Committee, Foundation for Economic Success, 2017)

TABLE: N.M. CERTIFICATES AND DEGREES, 2016-2017, AWARDED BY ETHNICITY

	Certificates	Associate	Bach	Masters	Post Masters Certificate	Graduate Certificate	Doctorate	Professional	Total Degrees Production by Ethnicity
Hispanic	5,131	3,826	3,513	788	*	42	35	118	13,457
American Indian	954	798	337	83	10	*	*	*	2,200
Asian	206	145	180	59	*	*	*	20	618
Black or African American	228	229	214	75	*	*	*	*	765
Native Hawaiian	28	20	17	*	*	*	*	*	69
White	3,295	2,736	2,850	1,017	*	102	85	123	10,214
Two or More Races	181	163	203	44	*	*	*	13	617
Race/Ethnicity Unknown	327	263	151	72	*	*	12	10	843
Non-Resident Alien	81	92	238	262	*	11	77	*	766
Total	10,431	8,272	7,703	2,403	24	183	230	303	29,549

*Data suppressed; fewer than 10 students in this category attained this award.

Appendix C: Changes in Tuition Rates, Public Institutions, 2004-2017

TABLE: N.M. TUITION DATA, 2004, 2010, 2018

	2-Year Programs	4-year Programs
2004-2005	\$1,040	\$3,909
2010-2011	\$1,325	\$5,128
2017-2018	\$1,755	\$6,921
Percentage difference, 2010 to 2017	32%	35%
Percentage increase, 2004 to 2017	69%	77%

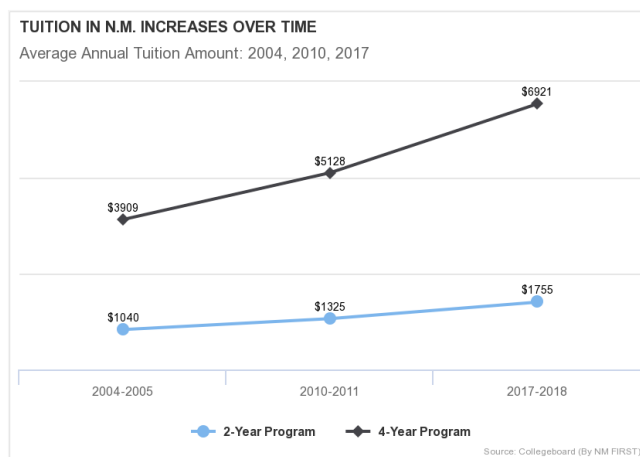


Figure 26: Tuition increases in N.M., 2004-2017

Appendix D: Dual Credit Impact Data

TABLE: REMEDIATION RATES FOR DUAL CREDIT STUDENTS VS. ALL COLLEGE STUDENTS IN N.M.

	FY12	FY13	FY14	FY15	FY16
UNM, NMSU, and ENMU					
Dual credit students	17%	14%	12%	10%	9%
All students	33%	32%	30%	29%	31%
CNM and NMSU-DA					
Dual credit students	43%	48%	44%	42%	38%
All students	71%	72%	70%	62%	62%

Source: LESC compilation of data from HED, NMSU, UNM, ENMU, and CNM

Appendix E: Community College Non-credit Workforce Training

The state Legislative Finance Committee says the state spends approximately \$8 million a year on direct support for workforce training and development at public community colleges, including adult basic education and literacy.³²² New Mexico allocates funds based on the number of non-credit contact hours they provide. Citing national labor experts, the LFC said community colleges could make better use of state money by paying closer attention to employer needs, particularly by focusing on job listings and other data sources that directly reflect demand.³²³

TABLE: NON-CREDIT WORKFORCE TRAINING AT NEW MEXICO COMMUNITY COLLEGES

Institution	Student Contact Hours FY 2016-17
CNM	59,099
Clovis	1,165
ENMU Roswell	6,799
ENMU-Ruidoso	8,859
Luna	
Mesalands	
NMJC	40,609
NMSU-Alamogordo	
NMSU-Carlsbad	1,340
NMSU-Carlsbad	1,340
NMSU-DACC	21,058
NMSU-Grants	
SJC	40,834
SFCC	26,320
UNM-Gallup	16,288
UNM-Los Alamos	1,220
UNM-Taos	1,908
UNM-Valencia	11,193
Total	236,691

Source: N.M. Association of Community Colleges

³²² (LFC, 2016)

³²³ (LFC, 2016)

Appendix F: Higher Education Related Legislation, 2018 Legislative Session

Below is a list of higher education related legislation introduced in the 30-day, 2018 legislative session. This list provides an example of the types of higher education related legislation introduced rather than a comprehensive list of legislation introduced in recent years.

TABLE: HIGHER EDUCATION RELATED LEGISLATION, 2018 N.M. LEGISLATIVE SESSION

Bill Number	Bill Title	Sponsor
HB 23	Additional high school graduation requirement, prior to graduation students apply to a postsecondary educational institution, commit to an internship, apprenticeship or military service	Gentry, Ivey-Soto
HB 30	Soft skills programs appropriations	Rehm
HB 114	Pathway to college pilot project	Roybal Caballero, Morales
HB 265	Alternative teacher license requirements	Sarinana, Salazar, C. Trujillo, Stapleton, L. Trujillo
HB 270/SB 140 (PASSED)	Lottery Scholarship awards and tuition costs, designates a fixed amount depending on whether the institution is a 4-year or community college.	Smith, Montoya/Soules
HB 259	Appropriations for early college high school initiative within UNM Chicano and Chicana studies dept.	Roybal Caballero
HB 303	Report on Higher Education Economic Development Programs	McCamley
HB 78/SB 53	Career, technical student organizations appropriations	Brown, Dow, Roch/Padilla
HM 48/SM 64 (PASSED)	Central NM Community College Day	Rehm, Hall, Larrañaga/White
SB 10	Health professional loan repayments through physician fees	Kernan, Stefanics
SB 218	College affordability endowment appropriations	Morales
SB 251	UNM-BBER education and training program study for uranium site clean-up	Pinto
SB 258	Contingent transfer of Luna Community College to New Mexico Highlands University	Campos
SJR 1	Nominating board of regents	Steinborn, Moores
SJR 13	Removal of board of regent	Lopez
SM 54 (PASSED)	TRIO programs, encourages high-school students to go on to postsecondary education	Sapient
SM 58 (PASSED)	Community college completion day	Campos

Appendix G: Student-Centered Communication

As noted in Chapter 2, this report’s writers encountered many examples of materials intended to help students but instead used extensive jargon or organized the information poorly. Below are two examples: the first illustrating a cumbersome presentation of information and the second attempting a student-centered delivery. The example is healthcare, but could apply to any profession.

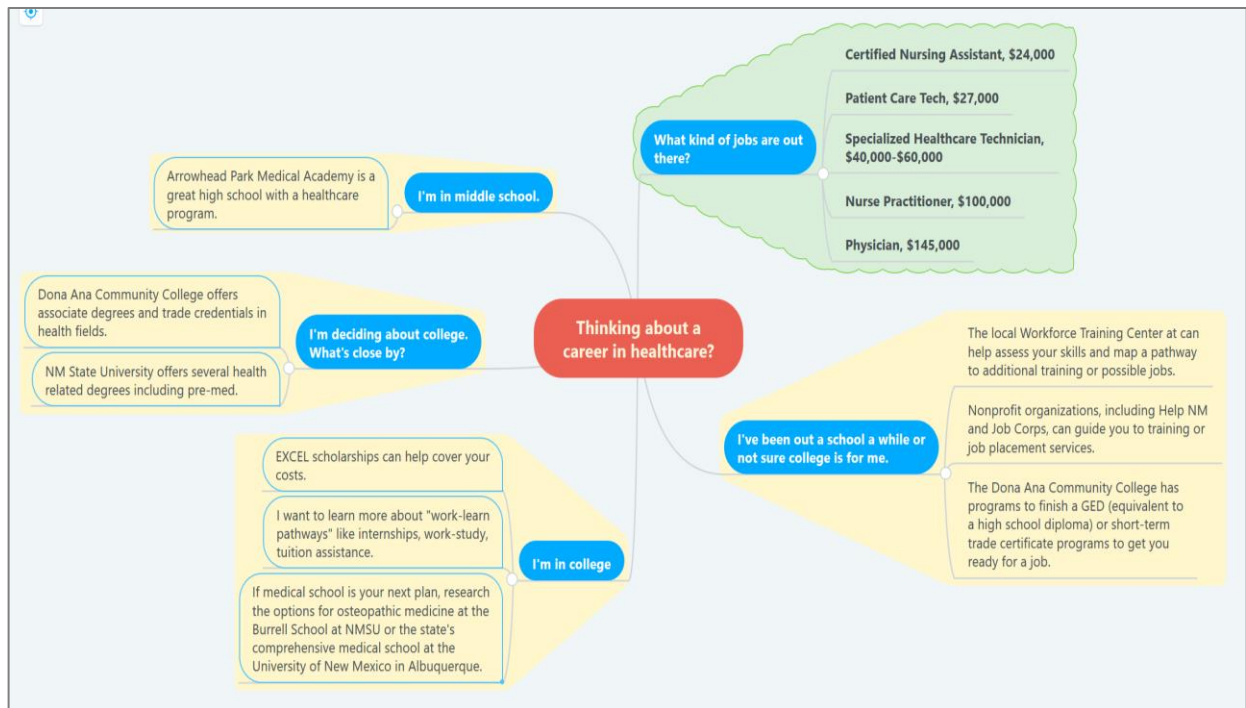
OCCUPATIONAL DATA FOR HEALTHCARE ADMINISTRATION

The Bureau of Labor Statistics created the following presentation of data regarding healthcare jobs.

Occupation	Employment (in thousands)		Employment change, 2012-2022		Job openings due to growth and replacement needs, 2012-2022 (in thousands)	2012 median annual wage	Education, work experience, and training		
	2012	2022	Number (in thousands)	Percent			Typical entry-level education	Work experience in a related occupation	Typical on-the-job training
Total, all occupations	145,355.8	160,983.7	15,628.0	10.8	50,557.3	\$34,750	-	-	-
Medical equipment preparers	51.6	62.0	10.4	20.3	20.3	30,820	High school diploma or equivalent	None	Moderate-term on-the-job training
Claims adjusters, examiners, and investigators	297.6	309.1	11.5	3.9	80.3	59,960	High school diploma or equivalent	None	Long-term on-the-job training
Medical records and health information technicians	186.3	227.5	41.1	22.1	90.4	34,160	Postsecondary non-degree award	None	None
Medical and health services managers	315.5	388.8	73.3	23.2	149.9	88,580	Bachelor's degree	None	None

IS HEALTHCARE THE CAREER FOR YOU?

New Mexico First created the following graphic, intended for students in the Las Cruces area, from handouts produced by Bridge of Southern New Mexico. If published, the graphic would include links to the listed resources.



Appendix H: Healthcare Workforce Pipeline Programs

COLLABORATIVE PIPELINE PROGRAMS

Association of American Indian Physicians (AAIP) Four Corners Alliance, Pre-Admission Workshop (PAW):³²⁴ The AAIP has a longstanding partnership with the Four Corners Alliance (University of Colorado, University of Utah, UNM, University of Arizona - Tucson, and University of Arizona - Phoenix) to host an annual health career Pre-Admission Workshop (PAW). The PAW brings together AAIP member physicians, American Indian and Alaska Native college students, public health professionals, university admissions professionals and other interested individuals with the goal of providing students with the information and skills necessary to succeed in the medical and health-profession school admission process.

American Indians Into Nursing Collaborative Grant:³²⁵ In 2016, the Indian Health Service (IHS) awarded the UNM College of Nursing a \$300,000 grant to train and educate more American Indian and Alaska Native nursing students who will practice at IHS centers in New Mexico and across the country. The three-year grant brings together the UNM College of Nursing, San Juan College and the UNM Center for Native American Health. The partnership provides financial support, mentoring, training and clinical experience to eligible students.

Dream Makers Health Careers Program (DMHCP): Dream Makers is a collaboration between the UNM HSC Office for Diversity and school districts throughout New Mexico. Dream Makers provides middle and high school students with unique opportunities to gain exposure to health professions while strengthening science and math skills. This program aims to stimulate interest in the health professions, especially among underserved and underrepresented populations in New Mexico, and to increase awareness of the urgent need for healthcare workers in our state. Dream Makers provides students the opportunity to realize their abilities, opportunities, and potential for success in the health sciences fields.

New Mexico Nursing Education Consortium (NMNEC):³²⁶ The NMNEC is a consortium of over 26 nursing higher education programs, organizations and individuals throughout the state. The consortium is committed to implementing a common, sustainable statewide nursing curriculum, increasing the number of Bachelor of Science in Nursing (BSN) and graduate degrees awarded, and preparing a qualified, diverse and professional nursing workforce particularly in rural areas. Many of the consortium's objectives can be traced to statewide deliberations that took place in 2008 led by the N.M. Board of Nursing and the N.M. Center for Nursing Excellence.³²⁷

SUN PATH Consortium:³²⁸ The New Mexico Skill UP Network Pathway Acceleration in Technology and Healthcare (SUN PATH) Consortium, comprised of higher education and industry leaders, has developed programs throughout the state that accelerate students through community college healthcare training programs and directly into the workforce. Over the past three years, SUN PATH has served close to 3,400 students with over 2,300 credentials earned so far. Of those students, over 500 became employed upon completion of their studies, and over 1,260 who were already employed received a wage increase post-enrollment. SUN PATH is a \$15 million project funded by the U.S. Department of Labor through the Trade Adjustment Assistance Community College and Career Training Initiative (TAACCCT) with the bulk of the funding ending in 2018.

UNM/NMSU Cooperative Pharmacy Program (CPP):³²⁹ The UNM/NMSU Cooperative Pharmacy Program (CPP) is designed to increase the number of pharmacy students from southern New Mexico and that practice in the area. Students selected during their senior year in high school will complete the pre-pharmacy coursework at NMSU, then enter the UNM College of Pharmacy. CPP students will also spend summers participating in pharmacy practice experiences in southern New Mexico. As members of the Pre-Pharmacy Society (PPS), all students receive assistance in applying to the UNM College of Pharmacy or other pharmacy schools. The PPS also provides students with professional development, networking opportunities, academic support and community involvement.

³²⁴ (Association of American Indian Physicians, n.d.)

³²⁵ (UNM HSC Newsbeat, 2016)

³²⁶ (N.M. Nursing Education Consortium, n.d.)

³²⁷ (New Mexico First, 2008)

³²⁸ (N.M. SUN PATH Consortium, 2017)

³²⁹ (NMSU, n.d.)

UNM HEALTH SCIENCES CENTER PIPELINE PROGRAMS

Building Outstanding STEM-H Students (BOSS): The mission of BOSS is to engage, inspire, and increase the level of participation of K-12 African American students in STEM-H careers. This is achieved by developing programs and partnerships with local community based organizations with strong STEM-H opportunities and further develop these programs such that all youth have a better appreciation for the contributions of African-Americans in STEM-H achievements. There is clear evidence of the need to engage, inspire and increase the level of access, opportunity and participation of K-12 African-American students in STEM-H educational experiences thereby inspiring these youths to pursue and become leaders in STEM-H fields.

Center for Native American Health-Indigenous Pre-Admission Education for the Health Professions (CNAH-iPrEHP Workshop): The CNAH-iPrEHP assists Native American undergraduates and para-professionals to navigate the higher education admissions process for degree programs available at the UNM Health Sciences Center.

Health Careers Academy (HCA): HCA is an intense and rewarding six-week non-residential program held at the UNM Health Sciences Center for rising high school sophomores, juniors, and seniors. HCA is designed to help strengthen ACT scores and provides dual credit. The program is designed to enhance math, science, language, and critical thinking skills. It also aims to stimulate interest in the health professions, especially among underserved and underrepresented populations in New Mexico, and to increase awareness of the urgent need for healthcare providers in our state. HCA will challenge students by balancing a rigorous academic curriculum with service learning, cultural humility trainings, and health career exploration.

MCAT+/PCAT+/DAT+: These are academically rigorous summer programs that provide an academic learning environment and test preparation for New Mexico residents preparing to take the Medical College Admissions Test, Pharmacy College Admissions Test, or the Dental Admissions Test.

Mental & Behavioral Health Academy (MBHA): Through a partnership with the UNM School of Medicine Department of Psychiatry Center for Rural and Community Behavioral Health, this program provides an opportunity for those interested in mental and behavioral health careers to participate in a hybrid program that includes test preparation, academic enrichment, career explorations, and service learning.

New Mexico Clinical Education Program (ClinEd): A six-week summer program for pre-professional students who wish to apply to the UNM School of Medicine and are seeking to gain clinical experiences in rural and/or medically underserved communities. The program provides middle school through pre-professional students with health career awareness and exploration opportunities, testing preparation, and the chance to develop and hone critical thinking skills in an academically rigorous, culturally responsive, and supportive learning environment

Undergraduate Health Science Enrichment Program (UHSEP): This six-week academically rigorous, residential program at the UNM Health Sciences Center provides an academic learning environment for entering college freshman who are interested in a career as a health professional. UHSEP was designed to meet New Mexico's needs by training youth to become competitive applicants to enter health professional schools. The program challenges students with a rigorous academic curriculum and provides college credit and developmental support.

Undergraduate Pipeline Network Summer Research Experience: This 10-week summer program seeks to cultivate students' interest in research while helping them attain skills needed to apply for and succeed in post-baccalaureate education. The program provides the opportunity for students to choose from several areas of research the UNM HSC.

UNM School of Medicine BA/MD Program: Under the BA/MD program students earn a baccalaureate degree in a challenging four-year curriculum specifically designed to prepare them for medical school and to practice medicine in New Mexico. Upon graduation eligible students then transition to the UNM School of Medicine to complete their doctor of medicine degree.³³⁰ After completing their medical residency many of these New Mexico students return to practice in New Mexico.³³¹

³³⁰ (UNM Health Sciences Center, n.d.)

³³¹ (Romero-Leggott, 2018)

Appendix I: Energy Workforce Resources

ENERGY COMMERCE MAJOR³³²

In 2005, an NMSU student proposed a “degree option to equip business graduates with a solid and well-rounded knowledge of both the domestic and global energy industries. Graduates, receiving a Bachelor of Business Administration degree with a specialization in Energy Commerce, [would] be prepared to compete for opportunities in the areas of energy finance, accounting, economics, land management and areas involving the trading and marketing of energy commodities.”

At the time, an “all-inclusive approach in presenting applications in all major existing and emerging energy industries” would have set the interdisciplinary Energy Commerce major apart. The curriculum was essentially a “compilation of courses already offered at NMSU and course descriptions from the universities of Texas, Oklahoma and Houston, Texas Tech, Oklahoma State and Tulane. Courses were selected based on survey results, interviews and frequency of course subjects among energy industry-serving universities.”

The bachelor’s degree option was not adopted by NMSU, but the excerpts in this appendix are presented as an example of a non-technical energy major. The proposal grouped together 30 credits of major course requirements and six environment-related credits. Recommended major course requirements were:

- ACCT 301. Financial Accounting I
- ACCT 321 (Proposed). Financial Statement Analysis of Energy Companies
- EC 301 (Proposed). Introduction to Energy Commerce
- ECON 445 (Proposed). Economic Analysis of Energy Markets
- ECON/MGT 335. Business and Government
- FIN 355. Investments
- FIN/AG E 311. Financial Futures Markets

Lastly, the proposed degree option would have required an additional nine credits from “elective courses that complement the Energy Commerce core, such as Public Utilities Regulation, Real Estate Valuation, and Production and Operations Management. Additional elective courses in Rural Appraisal and Real Estate Principles and Law, for example, give the Energy Commerce student a chance to extend knowledge to succeed as a landman, one who negotiates and prepares leases, researches ownership and drafts contracts.”

NEW MEXICO ENERGY ROADMAP WORKFORCE AND EDUCATION GOALS AND STRATEGIES³³³

Goal: By 2020, better align education and training programs at New Mexico's two- and four-year colleges with current and future energy workforce needs.

- Develop an ongoing public-private partnership of energy companies, higher-education institutions, national laboratories, K-12 schools, and other public and public-private entities to further STEM learning and prepare New Mexico students for careers in energy.
- Identify key knowledge, skills, and abilities needed for current and future energy-sector jobs in New Mexico.
- Catalog existing energy training programs and curriculum available in New Mexico.
- Identify gaps between education and training programs and employers' reported needs.
- Develop curriculum, internship/ apprenticeship programs, and job recruitment strategies through a public/private partnership that addresses gaps in training and strengthen existing programs.
- Prioritize recruitment and retention of well-qualified faculty and instructors with energy-related experience and expertise.
- Meet at least bi-annually to review progress and address evolving needs.

³³² (Taylor, 2005)

³³³ (EMNRD, 2018)

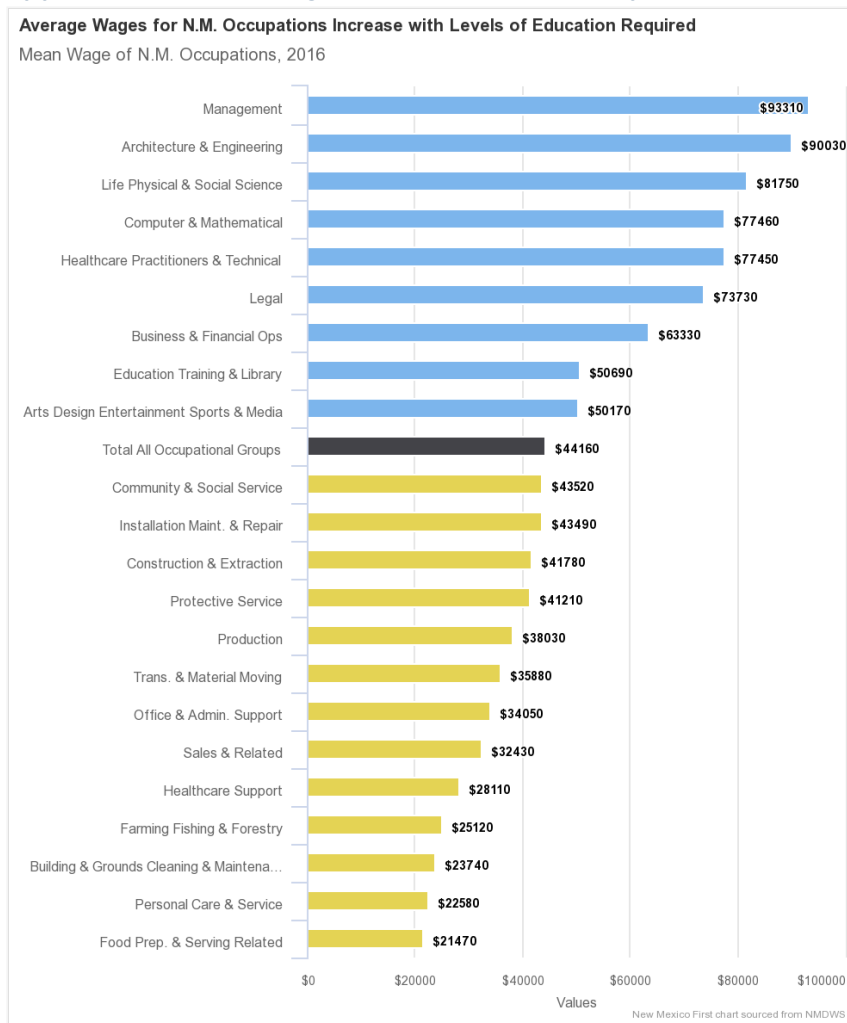
Goal: Through a public-private partnership, create energy career outreach program that reaches 15,000 students annually.

- Meet at least bi-annually to review progress and address evolving needs.
- Continue and expand partnerships between higher education institutions, rural and tribal communities.
- Offer energy-career activities in high schools and enrich classes with energy career content.
- Develop, distribute, and support the implementation of a one-semester high school energy course to improve energy literacy.
- Promote energy-related STEM clubs in schools statewide and STEM summer programs and increase student participation.
- Sponsor a Senate memorial every legislative session to encourage energy career opportunities.

Goal: Remove barriers for New Mexican students to enter energy training programs.

- Develop diverse financial support for energy-related programs and students, including through industry- and trade organization-financed student scholarships, professional internships and research experiences.
- Recommend revisions to Lottery Scholarship to reflect needs of both traditional and nontraditional students pursuing energy-related fields of study.

Appendix J: Mean Wage of New Mexico Occupations



Bibliography

- 100,000 Opportunities. (n.d.). *Who Are Opportunity Youth*. ACT. (2014).
- ACT. (2017). *The Condition of College and Career Readiness*. ACT. (2017). *Profile Report – National, Graduating Class 2017*. ACT. (2018).
- Albuquerque Business First. (2017, August 17). Albuquerque Business First Higher Education Forum.
- Albuquerque Business First, & Davis, R. (2018, February 20). *How JTIP request for more funding fared at the Legislature*.
- Albuquerque Business First; Mayfield, Dan;. (2013). *ABQ trying to match would-be workers with jobs*.
- Albuquerque Business First; Vadnais, Juliana;. (2017, December 17). *Albuquerque's Recovery Is Continuing But Our Recovery Index Is Not*.
- Albuquerque Journal. (2017, July). *ABQ Journal Higher Education Town Hall*.
- Albuquerque Journal. (2017, August 27). *Editorial: Strong leaders are crucial as higher ed transitions*.
- Albuquerque Journal, & Carrillo, E. (2017, November 17). *Luna Community College faces loss of accreditation*.
- Albuquerque Journal; Roch, Dennis; Shendo, Benny. (2017, December 18). *Dental therapists would fill a need*.
- Allen, M., & Hobbs News-Sun. (2014, October 31). *Supporting energy projects in Lea County*.
- American Chemical Society. (2000). *Chemistry in Context: Applying Chemistry to Society, Third Edition*.
- American Community Survey, U.S. Census. (2016).
- American Council on Education. (2010). *Solutions for our Future Fact Sheet*.
- American Council on Education. (2017). *Identifying Predictors of Credential Completion Among Beginning Community College Students*.
- American Wind Energy Association. (2017). *Wind Energy in New Mexico*
- Andallah, C., & Albuquerque Journal. (2017, May). Higher Education Town Hall, staff notes.
- Associated Builders and Contractors of N.M. (n.d.). *Apprenticeship Programs-Carpentry Program*.
- Association of American Colleges & Universities. (n.d.). *High-Impact Educational Practices*.
- Association of American Indian Physicians. (n.d.). *Pre-Admission Workshop*.
- Baier, E., & Minnesota Public Radio News. (2015). *Foreign-trained doctors could soon have easier path in MN*.
- Benton, C., & Hobbs News-Sun. (2016, June 22). *Halliburton down to bare bones*.
- Blivin, J. (2018). (G. T. New Mexico First, Interviewer)
- Bradsher, K., & New York Times. (2013, October 23). *China Tries to Clean Up Toxic Legacy of Its Rare Earth Riches*.
- Brookings Institution, & Perr, G. (2017, August 7). *The new oil market: Chaos or order?*.
- Bureau of Labor Statistics. (2017). *College Enrollment and Work Activity of 2016 High School Graduates*.
- Business Insider. (2012, September 27). *The 20 College Majors That Lead To The Most Satisfying Careers*.
- California Acceleration Project. (n.d.). *Implementing Corequisite Models*.
- Center for Economic Policy and Research. (2016, April 2). *Retiring Baby Boomers Are Not the Main Reason for the Drop in Labor Force Participation*.
- Center for Research on Learning and Teaching. (2009). *Teaching for Retention in Science, Engineering, and Mathematics*.
- Center on Budget and Policy Priorities. (2015, October 21). *House Budget Committee Plan Cuts Pell Grants Deeply, Reducing Access to Higher Education*.
- Center on Budget and Policy Priorities. (2017, August 23). *A Lost Decade in Higher Education Funding State Cuts Have Driven Up Tuition and Reduced Quality*.
- Center on Budget and Policy Priorities. (2017, August 23). *A Lost Decade in Higher Education Funding: State Cuts Have Driven Up Tuition and Reduced Quality*.
- Centers for Disease Control. (n.d.). *Healthy Workforce Infographic*.
- CNM Ingenuity. (2017).
- Colgate. (n.d.). *Colgate Poor Oral Health Can Mean Missed School, Lower Grades*.
- College Choice. (n.d.). *Best Nuclear Engineering Degrees*.
- College Choice. (n.d.). *Best Petroleum Engineering Degrees*.
- Collins, G. (2018, March 5). *Global Energy Shifts: What Naval Security Practitioners Should Know*.
- Community College Review. (2018, February 26). *The Pros and Cons of Online Courses*.
- Complete College America. (n.d.). *15 to Finish*.
- Complete College America. (n.d.). *Corequisite Remediation: Spanning the Completion Divide*.
- Council for Adult and Experimental Learning. (n.d.). *Prior Learning Assessment Publications*.
- Courtney, J., & Legislative Finance Committee. (2018). (P. B. New Mexico First, Interviewer)
- Czarnecki, S., & Hobbs News-Sun. (2015, February 25). *Facility is last new building expected for foreseeable future*.
- DeKay, T., & Eastern New Mexico University. (2018). (P. B. New Mexico First, Interviewer)
- Dye, Jeff (2018, April 2, N.M. Hospital Association). (P.B. New Mexico First Interviewer)
- Department of Numbers. (n.d.). *New Mexico Household Income*.
- Devika, K., Parraga, M., & Reuters. (2017, July 26). *Why record U.S. oil exports are poised for even more growth. oil-exports/why-record-u-s-oil-exports-are-poised-for-even-more-growth-idUSKBN1AC0ER*
- Dupont, T. (2018, February 11). Neonatologist, Albuquerque, NM. (P. B. New Mexico First, Interviewer)
- Economic Development Corporation of Lea County. (n.d.).
- Ed Source, & Zinshteyn, M. (n.d.). *California State faculty still upset about remedial ed changes but compromise emerging*.
- Education Advisory Board. (2016).
- Education Commission of the State. (2016). *Early College High Schools*.
- Energy Fuels Inc. (2016, March 4). *Project – One of the Largest and Highest- Grade Uranium Projects in the U.S. – to 100%*.
- European Joint Undertaking for ITER and the Development of Fusion Energy. (n.d.). *Understanding Fusion*.
- Evisions, Inc. (2017, February 17). *The 5 Most Commonly Found Metrics for Student Success*.
- Florida, R. (2012). *The Rise of the Creative Class*. Basic Books.
- Florida, Richard. (2003, January 22). *Cities and the Creative Class*.
- Forbes; Petro, Greg;. (2017, December 17). *Is Amazon Making Walmart The New Mom-And-Pop Shop?*
- Forbes; Worstall, Tim;. (2013, March 31). *Of Course WalMart Destroys Retail Jobs: That's The Darn Point Of It All*.
- Geology.com. (n.d.). *Marcellus Shale - Appalachian Basin Natural Gas Play*
- Georgetown University. (2016). *Center on Education and the Workforce Reports*.
- Georgetown University. (2017). *Career Pathways: Five Ways to Connect College and Careers*.
- Georgetown University. (2017, July 11). *News release: It's Time to Fix Higher Education's Tower of Babel, Says Georgetown University Report*.
- Georgetown University. (2018). *Recovery Job Growth and Education Requirements Through 2020*.
- Georgetown University Center on Education and the Workforce. (2016). *The Divided Recovery: College Haves and Haven-Nots*.
- Georgetown University Center on Education and the Workforce. (n.d.). *Latinos Workforce*.
- Grassberger, R. (2018). (H. B. New Mexico First, Interviewer)
- Grassberger, R., & New Mexico First. (2017). *Gap Analysis Report on Workforce Needs of Northern N.M.*
- Gunthorpe, S. (2017). Central New Mexico Community College. (H. B. New Mexico First, Interviewer)
- Haederle, M. (2017, September 28). *UNM awarded \$7 million for integrated behavioral health intervention*.
- Hampton, L., & Reuters. (2018, January 15). *U.S. oil industry set to break record, upend global trade*.
- Harrison, J. (2018, February 22). (P. B. New Mexico First, Interviewer)
- Hartzler, T. (2018). (P. B. New Mexico First, Interviewer)
- Harvard Business Review. (n.d.). *Connecting Unemployed Youth with Organizations That Need Talent*.
- Hawker, V. (2018). (P. B. New Mexico First, Interviewer)
- Hayden, M., & Carlsbad Current-Argus. (2016, October 6). *Solar project completed near Roswell*.
- Hayden, M., & Carlsbad Current-Argus. (2017, April 3). *Interim facility one critical step closer to opening*.
- Healthcare Daily Online. (2017, November 22). *Transitioning from Military Medic To Civilian Healthcare Professional*.
- Heaton, J., & Hobbs News-Sun. (2018, March 11). *ELEA: facility is safest in the world*.
- Hedden, A. C., & Carlsbad Current-Argus. (2018, January 4). *New Mexico third in nation for oil production*.
- Hedden, A., & Carlsbad Current-Argus. (2018, March 2). *Interim nuclear waste storage facility moves closer to opening, despite critics*.
- Heinrich, M., & United States Senate. (2018, March 1). *Heinrich Cosponsors Legislation To Establish Tuition-Free Community College*.
- Hill, L., & Hobbs News-Sun. (2010, June 3). *Enrichment facility ready to operate*.
- Hill, L., & Hobbs News-Sun. (2015, March 1). *URENCO facility shifting gears*.
- Hobbs News-Sun, & Associated Press. (2011, February 13). *New drilling Method Opens Vast U.S. Oilfields*.
- Holtec International. (2018). *SMR-160. Financial Aid to Increase College Completion*.
- Innovate+Educate. (n.d.).
- Innovate+Educate. (2017). *Education to Employment: NM Pathways Project, Gallup-McKinley County*.
- Inside Higher Ed, & HCM Strategists. (2012, October 22). *Performing Under Pressure*.
- Jack Kent Cooke Foundation. (2017, November 9). *Making College Affordable: New Report Calls For Greater Transparency In Financial Aid Practices*.
- Jackle, A. (2018, March 4). (G. T. New Mexico First, Interviewer)
- Knittel, C., & Pindyck, R. (2013, July). *The Simple Economics of Commodity Price Speculation*.
- Koehler, J., & U.S. News. (2010, June 10). *Study: Half of STEM Jobs Don't Require Bachelor's Degree*.
- KRQE. (2018, March 8). *Gov. Martinez vetoes solar energy tax credit bill*.

- Locklear, M., & Engadget. (2018, March 9). *MIT embarks on ambitious plan to build nuclear fusion plant by 2033.*
- Lopez, N., Erwin, C., Binder, M., & Javier Chavez, M. (2018). *Making the Invisible Visible: Advancing Quantitative Methods in Higher Education Using Critical Race Theory and Intersectionality.* UNM Department of Sociology, UNM Department of Economics.
- Lumina Foundation. (2017). *How Competency-Based Education May Help Reduce Our Nation's Toughest Inequities.*
- Marcus, J., & The Washington Post. (2017, June 29). *Many small colleges face big enrollment drops. Here's one survival strategy in Ohio.*
- Mathematica Policy Research. (n.d.).
- McDonald, F., & Science Alert. (2017, May 1). *The UK Just Switched on an Ambitious Fusion Reactor - And It Works.*
- Medium.com. (2016, April 12). *Four Recommendations to Improve Student Loan Success.* Military.com. (n.d.). *Military Skills Translator: Health Care Specialist.*
- Military.com. (n.d.). *Opportunities in Healthcare for Military Veterans.*
- Mining Weekly. (2018, March 11). *Energy Fuels Narrows FY Loss.*
- Mose, B., & National Public Radio. (2018, March 8). *America's Oil Boom Is Fueled By A Tech Boom.*
- Mufson, S., & The Washington Post. (2014, December 1). *As oil prices plunge, wide-ranging effects for consumers and the global economy.*
- My Brother's Keeper Newsletter. (n.d.). *Changing the Narrative.*
- Nash, D.A., & U.S. National Library of Medicine National Institutes of Health. (2013, May 3). *A review of the global literature on dental therapists.*
- N.M. Compilation Commission, Sec. 21-13-1 NMSA 1978. (n.d.).
- N.M. Department of Education. (2012). *Next Step Plan Template Guidance and Instructions.*
- N.M. Department of Health. (2015). *2014-2015 New Mexico State Health Assessment.*
- N.M. Department of Health and Allied Agencies. (2013). *Report #13-03.*
- N.M. Department of Health and Allied Agencies. (2015, May 13). *Adequacy of New Mexico's Healthcare Systems Workforce: Report to Legislative Finance Committee.*
- N.M. Department of Higher Education. (2017). *Program Evaluation: Higher Education Cost Drivers and Cost Savings.*
- N.M. Department of Workforce Solutions. (2014, February). *New Mexico Employer Survey, 2014.*
- N.M. Department of Workforce Solutions. (2015). *2015 Veterans Profile.*
- N.M. Department of Workforce Solutions. (2015). *Economic Research and Analysis Bureau.*
- N.M. Department of Workforce Solutions. (2015). *Economic Research and Analysis Bureau.*
- N.M. Department of Workforce Solutions. (2016, November). *In-Demand Occupations for New Mexico and its Substate Areas.*
- N.M. Department of Workforce Solutions. (2016). *N.M. In-Demand Occupations.*
- N.M. Department of Workforce Solutions. (2017, June). *New Mexico 2017 State of the Workforce Report.*
- N.M. Department of Workforce Solutions. (2017, November). *Quarterly Census of Employment and Wages, Second Quarter 2017.*
- N.M. Department of Workforce Solutions. (2017, November). *Workforce Innovation Opportunity Act – 2016 State of New Mexico Annual Report.*
- N.M. Department of Workforce Solutions. (n.d.). *Local Area Unemployment Statistics (LAUS).*
- N.M. Department of Workforce Solutions. (n.d.). *Workforce Investment Act.*
- N.M. Economic Development Department. (2017, November 17). *FY19 Budget Presentation to the Legislative Finance Committee.*
- N.M. Economic Development Department. (n.d.). *Programs for Business.*
- N.M. Economic Development Department. (n.d.). *Step Up Program.*
- N.M. Energy, Minerals and Natural Resources Department. (n.d.). *Oil Conservation Division.*
- N.M. Energy, Minerals and Natural Resources Department. (2018). *Energy Roadmap*
- N.M. Energy, Minerals and Natural Resources Department. (n.d.). *Uranium.*
- N.M. Energy, Minerals and Natural Resources Department, Energy Conservation and Management Division. (2016). *Preliminary Study to Investigate the Feasibility of Deploying a Small Modular Reactor (SMR) Nuclear Power Plant in the State of New Mexico.*
- N.M. English Remediation Task Force. (2016). *Taskforce Report.*
- N.M. Health Care Workforce Committee. (2016). *2016 Annual Report.*
- N.M. Health Care Workforce Committee. (2017). *2017 Annual Report.*
- N.M. Health Resources. (2018).
- N.M. Higher Education Department. (n.d.). *Legislative Lottery Scholarship Program.*
- N.M. Higher Education Department. (2014). *NMHED Data Reports.*
- N.M. Higher Education Department. (2014). *Outcome Metric 4: Time and Credits to Degree, 2013-2014.*
- N.M. Higher Education Department. (2016). *Annual Report.*
- N.M. Higher Education Department. (2017). *Annual Report.*
- N.M. Higher Education Department. (2017). *Governance Structure: Study and Recommendations Report.*
- N.M. Higher Education Department. (2017). *NM Higher Education I&G Funding Formula: Technical Guide for the FY18 Budget Cycle.*
- N.M. Higher Education Department. (2018, January 18). (H. B. New Mexico First, Interviewer)
- N.M. Higher Education Department. (n.d.). *About GEAR UP New Mexico.*
- N.M. Higher Education Department. (n.d.). *College Affordability Grant.*
- N.M. Higher Education Department. (n.d.). *WICHE Loan For Service Program.*
- N.M. in Focus. (2016, June 3). *Student Loan Debt In New Mexico.*
- N.M. Join Apprenticeship and Training Committee. (n.d.).
- N.M. Legislative Education Study Committee. (2017). *Annual Report & Data Reference Guide to the First Session of the Fifty-Third Legislature.*
- N.M. Legislative Education Study Committee. (2018). *Additional Graduation Requirements Bill Analysis.*
- N.M. Legislative Finance Committee. (2017). *Program Evaluation: Higher Education Cost Drivers and Cost Savings.*
- N.M. Legislative Finance Committee. (n.d.). *Evaluation of dual credit programs.*
- N.M. Legislative Jobs Council. (2015, December). *Final Report.*
- N.M. Legislative Jobs Council. (2016, August). *Background Briefing and Meeting Schedule.*
- N.M. Nursing Education Consortium. (n.d.).
- N.M. Public Education Department. (2016). *Meeting Agenda.*
- N.M. Public Education Department. (2017). *Career Clusters Book.*
- N.M. Public Education Department. (n.d.). *Early College High School.*
- N.M. Public Education Department. (n.d.). *Early College High School Request for Applications Graduation.*
- N.M. Public Education Department. (n.d.). *Higher Education and high school partners.*
- N.M. Skill Up Network. (2017). *Pathway Acceleration in Technology and Healthcare.*
- N.M. State Land Office. (2017). *Annual Report.*
- N.M. SUN PATH Consortium. (2017).
- N.M. Voices for Children. (2015). *WIOA Presentation.*
- National Academy of Sciences. (2012). *Improving Measurement of Productivity in Higher Education.*
- National Center for Education Statistics. (n.d.). *Fast Facts.*
- National Center for Educational Statistics. (2017). *Integrated Postsecondary Educational Data System.*
- National Conference of State Legislatures. (2015). *Performance-Based Funding for Higher Education.*
- National Conference of State Legislatures. (2015). *Tuition Benefits for Immigrants.*
- National Conference of State Legislatures. (2017, November 28). *No Time to Lose: How to Build a World-Class Education System State by State.*
- National Education Association. (n.d.). *Research Spotlight on Recruiting & Retaining Highly Qualified Teachers.*
- National Public Radio (PBS), & Sanchez, C. (2016, May 14). *Career And Technical Education: Boom Or Bust?*
- Nature, & Brumfiel, G. (2009, July 2). *US nuclear recycling faces the axe.*
- Navajo Tech. (2016). *NTU Program Review 2016-2017.*
- New Mexico First. (2008). *Looking to the Future: Preparing for the Next Generation in Health Careers Final Report.*
- New Mexico First. (2016). *Town Hall 41-Economy: Background Report.*
- New Mexico First. (n.d.). *Moving from Talk to Action: Building Community Plans for a Strong Nursing Workforce.*
- New Mexico Kids Can. (2018). *New Mexico Kids Can, State of Education in New Mexico, 2018.*
- New Mexico Legislature. (2018). *Relating to the Legislative Lottery Tuition Scholarship.*
- New Mexico Lottery. (n.d.). *Legislative Lottery Scholarships Benefitting New Mexico's Future.*
- New Mexico State University. (2017). *NM 2017 Educator Vacancy Report.*
- New Mexico State University. (n.d.). *Deans Advisory Council.*
- New Mexico State University. (n.d.). *The Red to Green Money Management Program.*
- New Mexico State University. (n.d.). *UNM/NMSU Cooperative Pharmacy Program.*
- New Mexico Voices For Children. (2015, March). *Making College More Affordable for Working Families: A Critical Investment in New Mexico.*
- New Mexico Voices For Children. (2016). *The College Affordability Fund is depleted and needs to be replenished.*
- Newsmax, & Russell, S. (n.d.). *Top 5 Industries in New Mexico: Which Parts of the Economy Are Strongest?*
- Noonan, B. (2018, February). (H. B. New Mexico First, Interviewer)
- Nunez, C., & National Geographic. (2014, November 11). *How Green Are Those Solar Panels, Really?*
- Pham, S., Rivers, Matt, & CNN. (2017, July 17). *China is crushing the U.S. in renewable energy.*
- President's Council of Advisors on Science and Technology. (2010).
- President's Council of Advisors on Science and Technology. (2012). *Engage to Excel: Producing One Million Additional College Graduates with Degrees in Science, Technology, Engineering, and Mathematics Policy Report to the President.*
- Psychology Today. (2016, March 31). *The Silent Epidemic: Young Men Dropping Out of College.*
- Public Health New Mexico. (n.d.). *KUNM, After the Shake Up: The Behavioral Health System in New Mexico.*
- Puryear, C. (2018). (G. T. New Mexico First, Interviewer)
- Rashad, M. (2015, March 26). *Projected Lack of Behavioral Health Availability in Chaves County.*
- Reuters, Ngai, C., & Volcovici, V. (2015, December 23). *Oil companies rush to exploit end of U.S. crude export ban.*
- Richard Florida. (2014). *Jack Maddox Distinguished Lecture Series in Hobbs.*
- Robinson, S., & Hobbs News-Sun. (2018, March 11). *Annual debate over permanent funds' use reveal fears and hopes.*
- Robinson-Avila, K., & Albuquerque Journal. (2012, June 29). *Schott Solar Mesa del Sol Plant to Shut.*
- Robinson-Avila, K., & Albuquerque Journal. (2015, May 11). *Southeast NM presses pursuit of nuclear corridor.*

- Robinson-Avila, K., & Albuquerque Journal. (2017, August 28). *Producers employ tech innovations to keep lid on costs.*
- Robinson-Avila, K., & Albuquerque Journal. (2017, August 11). *State permanent funds hit record high.*
- Robinson-Avila, K., & Albuquerque Journal. (2018, March 12). *17 NM oil production hits another record.*
- Romero-Legott, V. (2018). (P. B. New Mexico First, Interviewer)
- Rothwell, J., & The Brookings Institution. (2013, June). *The Hidden STEM Economy.*
- Rudnik, L. (2017, April 16). *Avid for AVID College Prep Program Growing in SFPS. The Santa Fe New Mexican.*
- Rural Monitor. (n.d.). *Veterans in healthcare careers.*
- San Juan College. (2017). *Dual Credit Courses Approved Course List 2017-2018.*
- Sandia National Laboratories. (n.d.). *Fusion.*
- Sandia National Laboratories. (n.d.). *Internships.*
- Santa Fe New Mexican, & Nott, R. (2017, August 27). *NM among states with larges reductions in higher ed spending.*
- Sapin, R., & Albuquerque Business First. (2017, November 17). *Update: Xcel weighs in on how it will address concerns over massive NM wind project.*
- Sauceda, S. (2018, February). *Director of Workforce Training, New Mexico Junior College.* (G. T. New Mexico First, Interviewer)
- Scholarships.com. (2018, March). *Federal Grant.*
- Science Direct. (2017, January). *Massive open online courses and underserved students in the United States.*
- Sexton, D. (2017, July 28). *URENCO USA Update, presented to New Mexico Legislature Radioactive and Hazardous Materials Committee.*
- Sexton, D. (2018). (G. T. New Mexico First, Interviewer)
- Silverstein, K., & Forbes. (2017, September 8). *Japan Circling Back To Nuclear Power After Fukushima Disaster.*
- Social Science Research Council. (2017). *Promising Gains, Persistent Gaps.*
- Southern Regional Education Board. (2015). *Building Career Pathways to Credential Attainment and Workforce Opportunities in New Mexico.*
- Spolidoro, K. P. (2018). (P. B. New Mexico First, Interviewer)
- State Higher Education Executive Officers. (2016). *SHEE: FY 2015.*
- Statista. (n.d.). *Number of bachelor's degrees earned in the United States from 1949/50 to 2026/27, by gender (in 1,000).*
- Stelnicki, T., & Santa Fe New Mexican. (2017, November 19). *Headwinds for massive wind power project.*
- Stiny, A., & The Santa Fe New Mexican. (2018, March 1). *Feds to review proposed waste site for nuclear fuel rods.*
- Strata Education Network. (n.d.). *Strada-Gallup Education Consumer Insights.*
- Strathmore Resources Ltd. (2016, October 27). *Technical Report on the Roca Honda Project, McKinley County, State of New Mexico, U.S.A.*
- Strayer, N., & New York Times. (n.d.). *The Great Out-of-State Migration: Where Students Go.*
- Student Loan Hero, I., & Trull, J. (2018, February 28). *The Ultimate Guide to Paying Off Student Loans Faster.*
- Student Loan Report. (2017).
- Studentloans.net. (2017, January 11). *Student Loan Default Rates by School by State.*
- The Associated Press, & Seattle Times. (2017, December 19). *Lawmakers push for licensing system for dental therapists.*
- The Atlantic, & O'Brien, M. (n.d.). *How the Fed Let the World Blow Up in 2008.*
- The Bridge of Southern New Mexico. (2017). *Joint Regional Workforce Development Strategic Plan: Transforming the Economy with an Innovative, Connected Approach to Talent Development.*
- The Cheat Sheet; Elliott, Megan;. (2018, February 26). *Amazon Is Completely Destroying These Iconic Stores.*
- The College Board. (n.d.). *Tuition and Fees by Sector and State over Time.*
- The Corps Network. (n.d.). *Opportunity Youth Service Initiative.*
- The Economist. (2008, August 5). *Nothing to smile about: The oil price is dropping. Reasons not to cheer.*
- The Higher Learning Commission. (n.d.).
- The Higher Learning Commission. (n.d.). *Criterion for Accreditation.*
- The Institute for College Access & Success. (2014, June 12). *Data Show No Evidence of "Over-Borrowing" at Community Colleges Colleges Don't Need More Authority to Limit Student Aid Options.*
- The Institute for College Access & Success. (2015, October). *Student Debt and the Class of 2014.*
- The Institute for College Access & Success. (2017, September 18). *National Policy Agenda to Reduce the Burden of Student Debt.*
- The National Bureau of Economic Research. (2010).
- The National Center for Higher Education Management Systems. (2015). *Retention Rates - First-Time College Freshmen Returning Their Second Year: Four-Year Total.*
- The National Center for Higher Education Management Systems. (2015-2016). *New Mexico State Profile.*
- The Pew Charitable Trusts. (2015). *Federal and State Funding of Higher Education.* <http://www.pewtrusts.org/en/projects/dental-campaign/about/dental-therapy>
- The Rand Corporation, & Daugherty, L. (2018). *Designing and Implementing Corequisite Models of Developmental Education.*
- The Rural Monitor. (n.d.). *Organizations Help Veterans Transition into Healthcare Careers.*
- The Santa Fe New Mexican, & Krasnow, B. (2018). *Health care sector continues to be bright spot for New Mexico's economy.*
- The Santa Fe New Mexican; Cole, Tom. (2018, February 3). *New Mexico's lost decade: State mired in economic problems since Great Recession.*
- The Santa Fe New Mexican; Krasnow, Bruce;. (2017, November 18). *New Mexico's population growth slows to crawl.*
- The Santa Fe New Mexican; Matlock, Staci. (2016, April 30). *Rural health care gaps complicate pregnancies for New Mexico women.*
- The Solar Foundation. (n.d.). *National Solar Jobs Census 2017.*
- The Washington Post, & Douglas, G. (2017, September 8). *Pell Grant award to rise, but program reserves remain in jeopardy.*
- The Washington Post; Mui, Ylan;. (2016, April 1). *One of the biggest reasons to be optimistic about the economy.*
- Thomson Reuters, & U.S. Energy Information Administration. (2018). *U.S. Energy Information Administration.*
- U.S. Bureau of Economic Analysis. (n.d.). *Survey of Current Business.*
- U.S. Bureau of Labor Statistics. (n.d.). *Databases, Tables & Calculators by Subject.*
- U.S. Census Bureau. (2017). *Small Area Income and Poverty Estimates (SAIPE) Program.*
- U.S. Congress, Joint Economic Committee. (2017).
- U.S. Congress, Joint Economic Committee. (2017). *The College Affordability Crisis In America.*
- U.S. Congressional Research Service. (2008, March 27). *Nuclear Fuel Reprocessing: U.S. Policy Development.*
- U.S. Congressional Research Service. (n.d.). *Attachment 5 to Holtec Letter 5025017.*
- U.S. Department of Education. (n.d.). *A TEACH Grant can help you pay for college if you plan to become a teacher in a high-need field in a low-income area.*
- U.S. Department of Education. (2017). *Developmental Education Challenges and Strategies for Reform.*
- U.S. Department of Education. (n.d.). *FAQs about accreditation.*
- U.S. Department of Education. (n.d.). *Federal Student Aid.*
- U.S. Department of Energy. (2017, August 28). *About WIPP.*
- U.S. Department of Energy. (2017, January). *United States Energy and Employment Report.*
- U.S. Department of Energy. (2017). *WIPP Facts.*
- U.S. Energy Information Administration. (n.d.).
- U.S. Energy Information Administration. (2016, May 23). *United States remains largest producer of petroleum and natural gas hydrocarbons.*
- U.S. Energy Information Administration. (2017). *Electric Power Monthly.*
- U.S. Energy Information Administration. (2017). *International Energy Outlook.*
- U.S. Energy Information Administration. (2017). *Rankings: Crude Oil Production, December 2017.*
- U.S. Energy Information Administration. (2018, February 6). *Annual Energy Outlook.*
- U.S. Energy Information Administration. (2018, January 18). *State Profile and Energy Estimates: New Mexico.*
- U.S. News. (2017, September 17). *10 College Majors With the Best Starting Salaries.*
- U.S. News and World Reports. (n.d.). *School rankings.*
- U.S. News and World Reports, & Galvin, G. (2017, April 13). *How Much Does Your State Spend on Your College Education?*
- U.S. Nuclear Regulatory Commission. (2007). *Eddy Lea Siting Study.*
- Ulmer-Scholle, D., & New Mexico Tech. (n.d.). *Uranium Legacy Issues in New Mexico.*
- University of Central Florida. (2012, October 9). *NSF Awards UCF \$1.8 Million to Recruit Freshmen into STEM Majors.*
- University of New Mexico, & Chen, F. (2017). *An Alternative Pathway to College: A Qualitative Case Study of an Adult Learner in an Online Competency-Based Education Bachelor's Degree Program.*
- UNM Bureau of Business and Economic Research. (2017, April 6). *Census Population Estimate Release March 2017.*
- UNM Bureau of Business and Economic Research. (2017). *Healthcare Industry Presentation.*
- UNM Health Sciences Center. (2016). *Executive Summary.*
- UNM Health Sciences Center. (n.d.). *About the Combined BA/MD Degree Program.*
- UNM HSC Newsbeat. (2016, November 14). *UNM College of Nursing receives IHS grant to increase Native American students.*
- Vartabedian, R., & Los Angeles Times. (2017, July 2). *1,800 tons of radioactive waste has an ocean view and nowhere to go.*
- W.K. Kellogg Foundation. (n.d.). *Innovate Educate a Catalyst for Job Growth in Albuquerque.*
- Wake Early College of Health Sciences. (n.d.).
- Weiner, S., & Association of American Medical Colleges. (n.d.). *Addressing the Escalating Psychiatrist Shortage.*
- Western Interstate Commission for Higher Education. (n.d.).
- Western Interstate Commission for Higher Education. (n.d.). *WICHE New Mexico Fact Sheet.*
- World Nuclear Association. (2017, August). *Nuclear Power in Germany.*
- World Nuclear Association. (2017, October). *The Fukushima Accident.*
- World Nuclear Association. (2018, January). *Plans For New Reactors Worldwide.*
- Xcel Energy. (2017, March 21). *New Xcel Energy wind facilities offer \$2.8 billion in customer savings over 30 years.*
- Year Up. (n.d.).