

Career Pathways That Can Lead to Credible Credentials or Degrees:

Blurring the Line Between High School and Postsecondary Studies

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NM Job Openings by Occupation and Educational Level through 2020 — in Thousands

Occupation	Less than HS	HS Diploma	Some College	Associate's Degree	Bachelor's and Above
Managerial	2	6	13	4	21
STEM	0	2	2	2	9
Social Sciences	0	0	0	0	3
Community Services/Arts	0	2	3	1	9
Education	0	1	3	1	16
Healthcare Professional	0	1	3	4	7
Healthcare Support	1	5	3	2	0
Food and Personal Services	14	21	17	3	5
Sales	6	26	30	8	14
Blue Collar	15	24	17	4	3
Total	38/10%	89/27%	89/27%	30/10%	89/27%



Source: Recovery: Job Growth and Educational Requirements Through 2020, June 2013, Anthony Carnevale, Nicole Smith, Jeff Strohl, Georgetown Public Policy Institute, Washington, DC

Building Career Pathways to Credential Attainment and Workforce Opportunities

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- Based on preliminary analyses, New Mexico needs to define high-quality career pathways that bridge high schools, postsecondary studies and 21st-century job opportunities:
 - High school students have access to at least 320 CTE courses.
 - Over 130,657 students were enrolled during 2013-2014 school year in one or more CTE course.
 - Based on a survey of 2014-2015 seniors, about 46 percent will complete four or more CTE courses.
 - Not enough students are completing sequences of four CTE courses in a planned structured career pathway.

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- New Mexico high school students have access to at least 320 CTE courses based on records SREB has studied. The emphasis appears to be on quantity of courses, not on a well-defined set of expectations for courses that are linked to postsecondary study and employment opportunities.
- Over 130,000 students were enrolled during the 2013-2014 school year in one or more CTE courses. These were not in a sequence of courses in a planned pathway linking to advanced study at the postsecondary level or to employment opportunities. Rather, they appear to be a collection of introductory courses.
- Based on a survey of 2014-2015 seniors who were identified as taking a concentration in CT studies, about 46 percent of the students are taking four or more CTE courses.

Building Career Pathways to Credential Attainment and Workforce Opportunities

- Preliminary analyses of high school CTE course data reveals that: (Continued)
 - Small schools have limited capacity to offer quality career pathways.
 - Few students are taking advanced/capstone CTE courses or participating in work-based learning experiences.
 - Online and dual credit CTE courses are limited, introductory and often are not part of a structured career pathway.
 - Less than 400 HS students earned credible industry credentials or licensures in 2013.

10 Goals: High-Quality Career Pathways in New Mexico

1. Establish rigorous, relevant career pathways driven by workplace opportunities.
2. Establish policy to create early advanced credential programs.
3. Set college- and career-readiness standards in literacy and math.
4. Close the gap between career pathway programs of study and workforce opportunities.
5. Increase to 25 percent the number of young adults earning credentials by age 25.

10 Goals: High-Quality Career Pathways in New Mexico

6. Increase access to high-quality work-based learning experiences.
7. Restructure low-performing high schools with low graduation rates.
8. Create a guidance system for career information, exploration and advisement.
9. Reform Student Teacher Accountability Reporting System (STARS) and state data and reporting systems.
10. Attract, prepare and retain high-quality CTE teachers.

Goal 1: Establish Policies for Rigorous, Relevant Career Pathways Driven by Workplace Opportunities

Key features of high-quality career pathways include:

- Combine a college-ready academic core with rigorous sequences of *at least four challenging CTE courses* organized around authentic assignments.
- Allow students who meet postsecondary-readiness standards to earn high school and college credits in structured career pathway dual credit courses.
- Allow students to engage in ongoing, progressively intensive work-based learning experiences.
- Engage students in ongoing career exploration and education counseling/advisement activities.

continued

Goal 1: Establish Policies for Rigorous, Relevant Career Pathways Driven by Workforce Opportunities

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Key features of high-quality career pathways include:

- Provide students with a choice of accelerated learning options in varied educational settings (e.g., early advanced industry credential or early college programs).
- Provide students with extended time and assistance to meet academic readiness standards for postsecondary study and training.
- Provide time for academic and career pathway teachers to plan real-world authentic assignments around academic readiness standards.
- Place all students on a path to further education and training and 21st-century jobs.

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See Page 1 of handout for 10 indicators of rigorous CT assignments.

Goal 1: Establish Policies for Rigorous, Relevant Career Pathways Driven by Workforce Opportunities

Recommendations:

- Require students to complete a concentration (a career pathway or set of AP/IB/Honors/dual credit courses) that prepare them with the foundational skills needed in further education and training for 21st-century jobs.
- Incentivize districts, colleges and employers to develop career pathways that align with identified workforce needs in state and regions.
- Develop, adopt and redesign current CTE courses into four-course career pathway sequences aligned to advanced credentials, and retire CTE courses not part of a pathway.

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Goal 1: Establish Policies for Rigorous, Relevant Career Pathways Driven by Workforce Opportunities

Recommendations:

- Offer career pathways in diverse settings — including two- and four-year postsecondary institutions and employer-sponsored, structured work-based learning programs — that allow students to earn credentials and college credits.
- Establish a uniform state dual enrollment policy that allows students to earn credits toward high school graduation and transcribed postsecondary credit that is transparent to all.
- Structure the state's dual enrollment program to focus on required academic courses or courses in defined career pathways, *not electives*.

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- **Dual credit:** Students who wish to take academic dual credit courses must demonstrate that they have met state college readiness standards. Students who wish to take career pathway dual credit courses must demonstrate that they have the foundational literacy and math skills needed to succeed in those courses.
- The state must establish common readiness standards and select assessments that measure students' readiness for postsecondary coursework. North Carolina's Career & College Promise program offers a template for this kind of dual enrollment program.
- Some postsecondary and secondary administrators in the survey report the lack of uniform policies across the state regarding dual credit. We haven't been able to follow up and more clearly define the issue.

Goal 1: Establish Policies for Rigorous, Relevant Career Pathways Driven by Workforce Opportunities

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Recommendations:

- Establish criteria and procedures through which state institutions will approve curriculum, standards, benchmarks, assessments and teacher qualifications for dual enrollment courses.
- Require students to demonstrate readiness before taking dual credit courses (e.g., meet college readiness standards for academic courses or career academic readiness standards for career pathway courses).
- Provide training to CTE teachers on how to develop multi-day project-based assignments that require students to apply a mix of academic, technical, cognitive, technological and workplace readiness skills to complete.

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See Page 1 of handout for criteria for rigorous CT Assignments.

Goal 2: Create Policies for Early Advanced Credential or College Programs

Create early advanced credential programs — modeled after early college high schools — that provide the extended learning time students need to graduate with a high school diploma plus an advanced industry credential.

- Due to time, most high school students cannot graduate with a diploma and advanced credential.
- Many high schools offer an assortment of introductory CTE courses; too few offer four-course career pathways with advanced dual credit courses leading to postsecondary study.
- Sixty high schools serve under 250 students and lack the resources to offer several career pathways.
- Unless more high school students gain access to early advanced credential programs, many will never earn one.

Goal 2: Create Policies for Early Advanced Credential or College Programs

Recommendations:

- Provide incentives to encourage school districts and postsecondary colleges to allow students with foundational literacy and math skills to participate in early advanced credential programs.
- Incentivize school districts to adopt flexible schedules and structures that allows students to earn advanced credentials in career fields critical to the state. Options:
 - Extended school day or year
 - Grades nine-10 at the high school; Grades 11-12 alternate weeks at a regional postsecondary institution
 - 13th-year programs at a regional postsecondary institution
 - Combination of online theory courses with lab courses at colleges

Goal 3: Set College- and Career-Readiness Standards and Goals

Set a long-term goal to have 80 percent or more of high school students academically prepared for college and careers.

- In 2013-2014, 10th-graders meeting Proficiency standards in reading and math on state's SBA assessment*

Reading	
Below Proficient	Proficient & Above
62.2	37.7

Math	
Below Proficient	Proficient & Above
69.6	30.4



Source: * New Mexico Accountability Data: Proficiency Rates, District and School, by Grade 2015, NMPED, 2014.

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- These numbers on 10th grade assessments are quite consistent with the ACT scores for 2013. About 38 percent of students are reading at a level to be able to handle complex text, advanced training and postsecondary materials; while about 30 percent have the math skills necessary for further study and to go into STEM-based certification, associate's degree or bachelor's degree programs.

New Mexico Percentage of Students Meeting ACT Benchmark Readiness Scores 2014

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	All Tested	STEM Interest
	69%	56%
English	55	57
Reading	37	39
Math	33	32
Science	29	32

Source: 2014 ACT Profile Report for New Mexico (Table 1.2)

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- Sixty-nine percent of the students in 2014 participated in the ACT exams. Of those participating students, 55 met the benchmark readiness score in English set by ACT that predicts college success. However, only 37 percent met it in reading; 33 percent in math; and 29 percent in science.
- These results suggest an accelerated effort is needed to engage students in reading grade-level text in both middle grades and high schools in all subject areas. This would involve an intensive preparation of all teachers including CTE teachers to engage students in reading grade-level materials and demonstrating their understanding of those materials in writing. SREB has found the Literacy Design Collaborative (LDC) a successful approach.
- In math, it means the need for an intensive staff development program such as adopting and using the Math Design Collaborative (MDC) which SREB has found to be quite successful in working with middle grades and high school teachers to create a balanced approach to math instruction focused on both procedural fluency and the ability of students to reason, understand and apply math concepts.
- Successful efforts require about 10 days of instruction over a year in both the literacy and math work for teachers to grasp these new practices using their current textbooks and materials.
- Twenty-nine percent of the students met the benchmark in science. This can be increased as teachers learn how to engage students in reading science texts and related documents and express their understanding in writing.
- Just over half of the students who took the ACT exam, 56 percent, expressed an interest in STEM; however, one would expect those who plan to pursue STEM to have higher reading, math and science achievement. There is really not much spread between the performance of students with an interest in STEM and all students tested in these four core areas.

Goal 3: Set College- and Career-Readiness Standards and Goals

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Recommendations:

- Establish literacy- and math-readiness standards for college, and set benchmark cut scores on readiness exams. Set different cut scores for STEM vs. non-STEM programs.
- Establish foundational literacy- and math-readiness standards needed for advanced training programs and set benchmark cut scores on readiness exams chosen.
- Conduct junior-year academic readiness assessments (e.g., ACT) as a measure of students' readiness for postsecondary education and training.
- Develop or adopt senior-year transitional literacy and math courses for students failing to meet readiness standards:
 - See SREB *Literacy Ready* and *Math Ready* courses at http://www.sreb.org/page/1508/sreb_readiness_courses.html.

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1. Work with secondary, postsecondary and industry partners to establish academic career-readiness standards that reflect the foundational skills needed in postsecondary programs and the workplace. Ensure that standards for each career pathway reflect the requirements of the field — for example, students preparing for STEM-related certificate and degree programs will need an advanced Algebra pathway.
2. Develop state guidelines to inform the ongoing development and revision of academic and technical curricula and instructional approaches to meet these standards, and provide intensive professional development to teachers on how to incorporate literacy and math in their instruction and assignments. For example, the **Literacy Design Collaborative** (LDC) offers an approach to incorporating rigorous literacy standards into middle grades and high school content areas in ways that advance students' literacy achievement and content knowledge. The **Mathematics Design Collaborative** (MDC) provides teachers with formative assessment lessons that help students develop procedural fluency and deepen their math reasoning and understanding.
3. Work with two-year and four-year colleges to develop senior-year transitional literacy and math courses like SREB's **Math Ready** and **Literacy Ready** courses that count as fourth English or math credits and allow students who pass these courses to be exempted from developmental education at the community and technical college. Math Ready stresses understanding math concepts and learning the concepts behind math procedures rather than memorizing them. Math Ready helps students develop the higher-order thinking skills needed to apply math skills, functions and concepts across settings. Literacy Ready teaches strategies for reading and understanding complex texts in all subjects. Students learn to develop and defend ideas and write about them in college-level formats.

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Rich Literacy Experiences

Response	Indicators	Percent
Intensive	7 - 9	33%
Moderate	4 - 6	39
Low	0 - 3	28

Source: High Schools That Work Student Survey and the New Mexico Student Survey

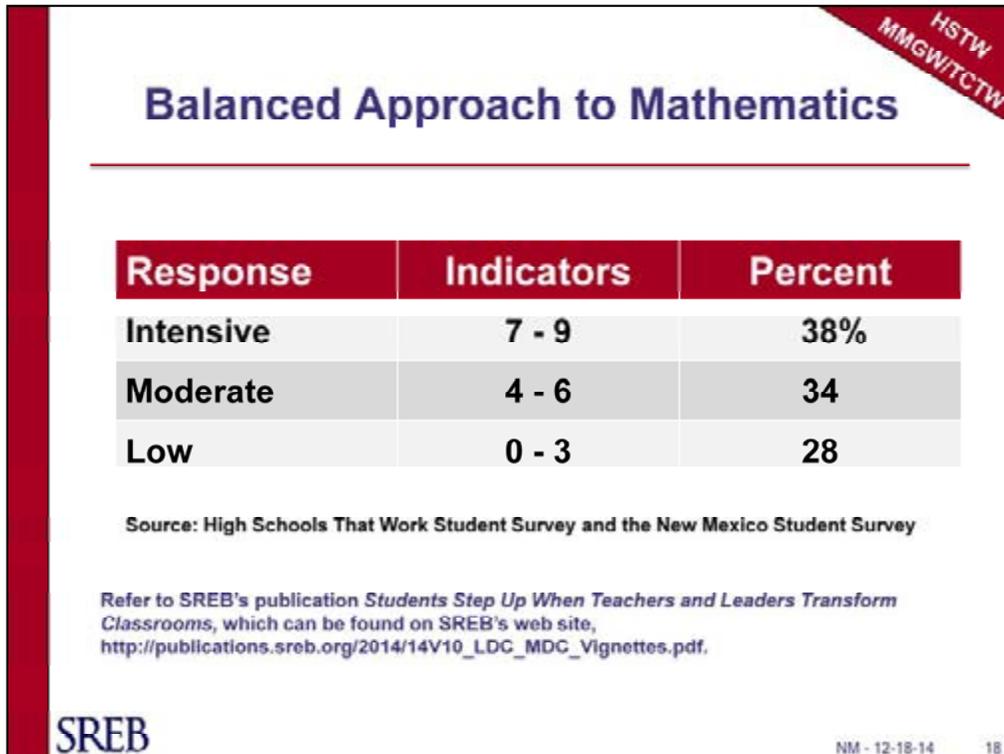
Refer to SREB's publication *Students Step Up When Teachers and Leaders Transform Classrooms*, which can be found on SREB's web site, http://publications.sreb.org/2014/14V10_LDC_MDC_Vignettes.pdf.

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Indicator Questions for Rich Literacy Experiences

- Read an assigned book and demonstrated understanding of the significance of the main ideas at least monthly.
 - Analyzed works of literature in English class at least monthly
 - Discussed or debated with other students about what they read in English classes **at least monthly**.
 - Required writing assignments that made me defend my thinking with support evidence from what I read.
 - Writing assignments required me to assess the reasoning and evidence from a text or other readings to support or refute the author's position.
 - Often asked to read challenging materials and write multi-paragraph papers on the readings to demonstrate my understanding.
 - The comments I get on my work help me understand how to improve.
 - Make inferences from information provided to develop a solution for a problem or project.
 - Complete an extended project that requires planning, developing a solution or product, and presenting the results orally or in writing.
 - Students who report experiencing frequent assignments that require them to read grade-level text and related documents to debate and discuss the meaning of what they have read and to commit their understanding in writing, have a significantly higher achievement on literacy readiness for college and careers.
- Refer to SREB's publication *Students Step Up When Teachers and Leaders Transform Classrooms*, which can be found on SREB's web site, http://publications.sreb.org/2014/14V10_LDC_MDC_Vignettes.pdf.



Indicator Questions for Balanced Approach to Teaching Math

- Encouraged to understand math concepts instead of just memorizing rules and procedures.
- Teachers provide feedback frequently to help me understand my mistakes and improve my performance in mathematics.
- Often grouped in math classes with students who have similar math skills to me.
- Teachers review my work and provide feedback questions to help me solve the problem rather than telling me what to do.
- Teachers give me problems to solve that require using multiple math concepts.
- Teachers give me challenging problems to solve and sometimes allow me to work on them independently.
- My mathematics teachers guide my understanding of mathematics through questioning as well as through explaining.
- My teachers give me the opportunity to revisit the concept that I had not mastered before taking a big test.
- Use math to solve complex problems related to your career/technical assignments.
- Students who report frequently experiencing seven of these 10 indicators in their math classroom make significantly more progress in meeting state and college- and career-readiness standards. The indicators stress math instruction that includes, but goes beyond memorizing rules, procedures and drill work to thinking through multistep problems, to reason out solutions, understand math concepts and apply them to authentic problems. They also have teachers who can ask questions to help students think through how to solve the problems on their own as opposed to giving them a series of steps to follow.

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Rigorous Assignments Career Technical Education Studies

Response	Indicators	Percent
Intensive	7 - 10	28%
Moderate	4 - 6	24
Low	0 - 3	48

Source: High Schools That Work Student Survey and the New Mexico Student Survey

Refer to SREB's publication *Students Step Up When Teachers and Leaders Transform Classrooms*, which can be found on SREB's web site, http://publications.sreb.org/2014/14V10_LDC_MDC_Vignettes.pdf.

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Indicator Questions for Rigorous CT Assignments

- Predict outcomes based on observations or information provided.
- Develop a logical argument for your solution to a problem or project.
- Do background research for a problem or project, such as reading technical article(s), before developing a plan or solution.
- Make inferences from information provided to develop a solution for a problem or project.
- Use math to solve complex problems related to your assignments.
- Apply academic knowledge and skills to complete assignments.
- Apply technical knowledge and skills to complete assignments.
- Develop and test hypotheses.
- Complete an extended project that requires planning, developing a solution or product, and presenting the results orally or in writing.
- Used computer software or other technology related to your career/technical area to complete assignments.
- Assignments in CTE classes require students to apply academic, technical, 21st century, technology and cognitive skills to complete results in 15 percent more graduates meeting readiness standards in math for college; about 20 percent more meeting readiness standards in literacy and science.
- Refer to SREB's publication *Students Step Up When Teachers and Leaders Transform Classrooms*, which can be found on SREB's web site, http://publications.sreb.org/2014/14V10_LDC_MDC_Vignettes.pdf.

Goal 3: Set College- and Career-Readiness Standards and Goals

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Recommendations:

- **Develop a process for selecting and approving industry certification examinations that reflect appropriate depth and breadth of academic and technical content. This process should include:**
 - **verifying that industry examinations prepare individuals for available high-skill jobs;**
 - **determining the amount of college credit passing the industry exams could carry;**
 - **validating that employers will give employment preference to individuals who hold these credentials; and**
 - **ensuring high school-level industry exams lead to more advanced credentials and degrees at the postsecondary level.**

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- See Page 9 of the handouts on (1) SREB's criteria for the review of industry certification exams and (2) the handout of the number of high-quality industry certification exams that were earned in New Mexico's high schools, two-year and four-year institutions. See Page 2.
- See Pages 4-6 for examples of SREB Advanced Career Pathways that lead to a series of credentials and degrees.

Goal 4: Closing the Gap Between CTE Offerings and Current Labor Demands

Align high-quality career pathways with postsecondary programs and labor market demand in key state and regional industry sectors.

- Some disconnect exists between CTE programs in which high school students are enrolled and the state's workforce demands.
- New Mexico is projected to have 335,000 jobs — 2010-2020
- 63 percent of jobs will require postsecondary education.
- 27 percent will require a bachelor's degree or higher.
- 37 percent will require some college, an associate's degree, or certificate/certification.
- 36 percent will require a high school diploma or less.

- Currently New Mexico has too few students earning an associate's degree, credible credential or a postsecondary certificate. See Slide 25.

Goal 4: Closing the Gap Between Current Offerings and Workforce Demands

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Recommendations:

- Designate appropriate state agencies to work with education and industry associations to identify critical industries for the state.
- Incentivize school districts to develop, adopt or redesign pathways leading to advanced industry and postsecondary credentials in sectors critical to the state.
- Promote high-demand workforce areas to schools, parents and students.
- Establish procedures through which regional councils can work with school districts and colleges to develop, adopt or redesign pathways leading to advanced industry and postsecondary credentials.
- Make investments in college and school districts to develop/adopt collaborative exemplary career pathways for high-demand career fields.

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- See Pages 13-14 for list of Advanced Career Pathway curricula SREB has developed in partnership with states.

Goal 4: Closing the Gap Between Current Offerings and Workforce Opportunities

Industry areas to consider adopting, developing or expanding career pathways include:

Industry Area	Projected Growth
Energy	38%
Utilities	11
Construction	9
Manufacturing	6
Wholesale and Retail Trade	33
Transportation, Warehousing, Logistics	42

- See pages 9-15 in Narrative for more details.

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Goal 4: Closing the Gap Between Current Offerings and Workforce Opportunities

Industry areas to consider adopting, developing or expanding career pathways include:

Industry Area	Projected Growth
STEM and like Careers	12-15%
Hospitality	40
Health Care/Social Assistance	Cont'd. Growth
Finance and Public Administration	Cont'd. Growth

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- See pages 9-15 in Narrative for more details.

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Goal 5: Increase to 25% the Number of Young Adults Earning a Credible Credential by Age 25

New Mexico must increase to 25 percent the number of young people completing advanced industry and postsecondary credentials.

Of 100 9th-Grade Students In New Mexico (based on 2012 data)	
Graduated high school on time	70
Did not graduate high school on time	30*
Of those who graduated on time (n = 70)	
Continued on to further study immediately	52
Did not continue on to further studies immediately, after graduating high school on time	18*
Of those who continued on to further study immediately (n = 52)	
Received a bachelor's degree in six years	21
Received an associate's degree in three years	7
Failed to get a degree on time (150% of expected)	24*

Sources: * 2010 data, Student Pipeline - Transition and Completion Rates from 8th Grade to College, National Center for Higher Education Management Systems (NCHEMS), 2014. ** 2012 data, SREB Fact Book on Higher Education, SREB, 2014. "Table 46: 100 Percent of Normal Time Graduation Rates in Public Universities and Colleges by Racial/Ethnic Group." *** 2012 data, SREB Fact Book on Higher Education, SREB, 2014. "Table 47: 100 Percent of Normal Time Graduation Rates in Public Universities and Colleges." NM - 12-18-14 25

- **Projections based on 2012 and 2013 data.**
- Of those 100 students entering the ninth grade, 52 continued on to further study immediately upon high school graduation. Eighteen did not immediately enroll in further study.
- At the end of six years, 21 students received a bachelor's degree while 7 received an associate's degree or an occupational certificate.
- Twenty-four students failed to earn either a bachelor's, associate's degree or an occupational certificate on time.
- Based on conservative estimates, it is projected that you will have 60 to 65 students out of the 100 who enter the ninth grade failing to either graduate from high school or earn some college education or any type of advanced industry certification or degrees.
- This is at a time when it is projected that by the early 2020s, about 63 percent of jobs emerging in the state will require some college or training beyond high school, an associate's degree, an occupational certification or bachelor's degree or higher.
- Further, it is projected that about 27 percent of the jobs in New Mexico can be filled by those with a high school diploma, and 10 percent by those with less than a high school education. You realistically could have as many as 60 percent of your workforce who fall into this category.
- The challenge is to closed the educational gap.

Unemployment Rate of 20- to 24-Year Olds

Population	Age Range	2013 Unemployment Rate
All	All Ages	7.2
All	20- to 24-Year Olds	10.9
White	20- to 24-Year Olds	8.9
Hispanic or Latino	20- to 24-Year Olds	10.8

Source: U.S. Bureau of Labor Statistic (via New Mexico Department of Workforce Solutions)

- Based on U. S. Bureau of labor statistics in 2013, New Mexico has almost 11 percent of the youth between 20 and 24 who are looking for work unemployed. The issue is that these youths at this time are neither enrolled in advanced training programs nor in the workplace. Thus, they are not being developed for the opportunities emerging in the state.
- SREB has projected rough pipeline projections based on 100 students enrolling in the ninth grade. Of the 100 students who enroll in the ninth grade based on current data, 30 will not graduate from high school on time.

Goal 5: Increase by 25% the Number of Young Adults Earning a Credible Credential by Age 25

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- Provide bonus/incentive funding or extra weight in the state accountability system to:
 - Encourage colleges to work with school districts to create early advanced credential programs to increase the percentage of students who earn credentials or degrees.
 - Allocate extra weight in the accountability system for each HS student who meets both college- *and* career-readiness standards.
 - Allocate extra weight for credentials acquired in key career fields upon graduating from high school or at the end of the 13th-year program.

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- Making it possible for students to pursue credible credentials in high school is one way to see a tangible payoff in completing high school. This may require asking for exemptions in state graduation requirements for this to occur. Study Louisiana's Jump Start initiative.
- To blur the lines between high school and two-year programs will require incentives and bonuses that encourage both the school district and the two- and four-year institutions to work together to offer these programs.
- The state should set a goal of 25 percent of students who enroll in grade nine to hold an associate's degree, an advanced industry certification or an occupational certificate by age 25. **This should be a goal over the next decade.**

Goal 5: Increase to 25% the Number of Young Adults Earning a Credible Credential by Age 25

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- Require dual credit courses to be part of the core sequence toward a college major or a designated career field of study.
- Syllabus for dual credit courses must be developed by college faculty and approved by the college.
- The college prepares the end-of-course exam students must pass to receive credit for dual credit courses — the same exam administered to students who take the course on campus.
- Establish minimum foundational literacy and math skills for dual credit academic or CTE courses.

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- By credible credential we mean passing an approved industry or state licensure exam linked to employment opportunities in the state, a structured and focused occupational program resulting in a certificate or an associate's degree or higher that addresses critical industry needs in the state.
- Dual credit courses have been a runaway train in some states. They have allowed students to choose soft electives that lead to not really accrued credit toward a college major or any career field concentration. Many students wind up having to take remedial courses, but yet they were enrolled in dual credit courses.
- To SREB, it has never seemed reasonable to enroll students in dual credit, then they wind up in remedial math and literacy courses. Either they have the skill sets to do college-level work or they do not. There should not be a double standard.
- At this point, it is our general sense without fully completing the analysis, that many of the dual credit and online courses being taken aren't part of a structured pathway leading toward an associate's degree or advanced credential. Some courses are soft elective courses, not part of the core academic requirement for an associate's degree. Some of the CT courses have no linkage to an organized career pathway leading toward an advanced credential or associate's degree in a career field. We believe that tightening up this requirement, which we think is a great idea, will enhance the percentage of students who earn credentials by age 25.

Accountability points: Incentivize high schools, technology centers, community and technical colleges and instructors for accelerating student acquisition of advanced credentials and degrees in critical industries.

- **Qualifying for credit-bearing coursework/testing out of developmental education:** Allow students who score below college-ready benchmarks to co-enroll in credit-bearing academic and CTE courses and developmental instruction. Redesign developmental math pathways that incorporate the math skills needed in STEM and non-STEM fields and create multiple measures for student placement in those pathways.

Goal 5: Increase to 25% the Number of Young Adults Earning a Credible Credential by Age 25

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Recommendations — Encourage two- and four-year colleges to:

- Create multiple means of establishing postsecondary readiness that increase the number of avenues through which students can qualify for credit-bearing courses and test out of developmental education.
- Offer students individualized supports like tutoring, success courses, learning communities and summer bridge programs.
- Increase access to financial aid for students enrolled in advanced training programs leading to credentials in key industries.
- Incentivize employers and community colleges to invest in learn-and-earn programs.

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Study the work by North Carolina's system of Community Colleges to revise their assessment and placement system and support given to students as a means of reducing the number of students enrolled in developmental studies and to increase their completion rates.

Goal 6: Increase Access to High-Quality Work-Based Learning Experiences

- Few students report experiencing planned and structured work-based learning.
- Among surveyed high school principals:
 - 19 percent reported their schools do not offer work-based learning experiences.
- Only 22 percent of surveyed employers reported offering work-based learning experiences.

Goal 6: Increase Access to High-quality Work-based Learning Experiences

Job part of a formal training program?	
Yes, Co-operative Learning Program (co-op)	12%
Yes, Apprenticeship	8
Yes, Internship	9
Yes, Jobs for America's Graduates (JAG)	3
No	68

Source: High Schools That Work New Mexico Student Survey (administered in Fall of 2014)

- Of the CT students participating in the survey, 32 percent report having quality work-based learning experiences.

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Goal 6: Increase Access to High-quality Work-based Learning Experiences

Recommendations:

- **Incentivize industries with tax credits to provide quality work-based learning that engages students in authentic applications of academic, technical and workplace skills.**
- **Work with insurers, workforce commissions and others to develop policies to protect participating students and employers.**
- **Locate those responsible for coordinating work-based learning at the district or regional level, leveraging resources of workforce development agencies, chambers of commerce and others.**
- **Support smaller high schools that lack access to regional employers to engage students in school-based enterprises.**

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- New Mexico can use a variety of incentives to encourage employers to offer WBL for students. Extend state or local tax credits to employers to cover a portion of the salaries paid to student trainees and to cover a portion of the time employers spend training and mentoring students or reviewing students' project-based or work-based learning assignments. Consider gradually reducing tax credits on a sliding scale over time as student trainees offer greater value to their employers. Ask employers to commit to hiring some proportion of students who complete their training.
- For example, Maryland covers students participating in unpaid work-based learning experiences through the state's Workers' Compensation system. Students receive protection from the cost of medical expenses. State law limits employers' liability if a student is injured in an unpaid work-based learning experience. Kentucky signed an agreement with a temporary employment agency that hires and assumes liability for 16- and 17-year-old participants in paid internships. Businesses pay the employment agency, which in turn pays the students.

Goal 7: Restructure Low-Performing High Schools With Low-graduation Rates

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New Mexico's Comprehensive High Schools

Enrollment	Total Number of Schools*	School with less than 70% graduation rate**		Schools within 50 miles of a post-secondary school	
		<i>n</i>	%	<i>n</i>	%
1000+	39	12	31%	38	97%
751 - 1000	8	4	50	8	100
501 - 750	9	2	22	9	100
251 - 500	20	5	25	16	80
< 250	59	48	81	39	66
Total	135	71		110	81

Source: * Total includes comprehensive high schools in the state of New Mexico. Alternative schools and charter schools are not included in this total. ** 2011-2012 Adjusted Cohort Graduation Rate (ACGR) data.

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- Based on 2012 adjusted cohort graduation rates, 48 of your high schools that have an enrollment of less than 250 have a graduation rate of less than 70 percent and 39 of these schools are within a radius of 50 miles of a postsecondary college.
- Of your largest 39 high schools with 1,000 or more, 12 have a graduation rate greater than 70 percent and 38 of 39 schools are located within a radius of 50 miles of a college.
- Schools within a reasonable distance of a college have an opportunity to create early advanced credential or college programs that can serve to hold students in school and to graduation. When students can find a purpose and goal for remaining in school, that enhances graduation rates.

Goal 7: Restructure Low-Performing High Schools With Low Graduation Rates

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MMGW/TCTW

- For low-performing high schools serving 500+ students, establish in state policy an accelerated, comprehensive framework of strategies for restructuring high schools around career pathways that include:
 - at least four sequential CTE courses;
 - a college-ready academic core taught with a greater emphasis on project-based assignments that integrate academic, technical and workplace skills;
 - learning experiences in grades seven through 12 aimed at getting students to grade-level literacy and math standards (e.g., tutoring, supplemental instruction, transition courses); and
 - extended-day, after-school and summer-bridge activities that enhance readiness.

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- *Use federal, state and local funds to help low-performing high schools serving 500 or more students reorganize around theme-based career academies featuring rigorous, relevant career pathways.*
- Offer ongoing, intensive professional development and technical assistance to teachers, counselors and administrators on how to implement rigorous career pathways and improve literacy and math achievement. Include feeder middle grades schools in all reform strategies and professional development activities.
- Require low-performing schools to implement extended school years or days that offer the additional time students need to receive intensive instruction, engage in work-based learning and earn advanced credentials or degrees.

Goal 7: Restructure Low-Performing High Schools With Low Graduation Rates

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Continuation:

- progressive set of work-based learning experiences;
- a continuous counseling and advisement that help all students identify a career goal, connect with adult mentors and plan for careers and further study;
- opportunities to earn college credits toward industry and postsecondary credentials;
- a schedule that allows students to take classes as a cohort and gives academic and CTE teachers time to plan integrated project-based assignments; and
- opportunities to participate in co-curricular CTSOs, through which students develop valuable technical, leadership and employable skills.

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- *Engage and support district and school leaders, industry and postsecondary partners, community members and parents in taking ownership of career pathways as an essential element of reforming low-performing schools.* Foster sustainability by holding school boards and communities accountable.
- Monitor the fidelity of reform implementation through external audits and faculty, student and parent surveys.
- Creative approaches are needed to provide access to career pathway programs of study to students at small schools.

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Goal 7: Restructure Low-Performing High Schools With Low Graduation Rates

Increase access to high-quality career pathways in small schools.

Recommendations — Actions states can take to encourage through incentives in a accountability system that would :

- **Establish criteria for hybrid pathways such as innovation in science and technology. (See pages 4-6 of handout.)**
- **Develop two four-course sequences along two major strands where existing faculty exists such as:**
 - agriculture, welding, electrical, construction, motors — electrical and gasoline;
 - plant and animal science, horticulture, etc.; and
 - four-course sequence in business and information technology
- **Select up to two foundational online courses approved by the college in given career pathways with 3rd and 4th courses to be taken at the college on a mixed schedule of full days at the college and full days at the home school.**
- **Staff smaller high schools with a teacher who will serve as facilitators of Web-based courses.**

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- A hybrid pathway of four courses in innovations in science and technology, which has strong literacy components; every project has a math component and a technology component. Students work in teams around 21st-century-like skills would be a very useful course in small high schools. This curriculum was developed by the state of Arkansas in partnership with SREB and was designed for many of Arkansas' small schools. It is a way to strengthen both the academic core and to get students thinking about STEM-like jobs and careers. It is possible in some small schools with an Ag teacher and a business teacher to develop a four pathway sequence that could lead to a variety of work opportunities as well as postsecondary pathways.
- Select online courses linked to students' interests and linked to pathways at the college. It is possible to teach the first two courses online. It means designating a teacher who will be the online teacher facilitator. As I have said in earlier, it will take a renaissance teacher to do that.
- Establish with the college a 13th year advanced credential program or seek modifications in graduation requirements that students who have the essential foundational literacy and math skills to pursue full time a program that will result in a credential at the end of grade 12 at a two- or four-year institution.
- School-based enterprises are effective ways to engage students in the thought process of entrepreneurship and it is a way to unleash the creativity of youth. It would be well suited for small schools and could easily engage the full community. In some ways, you could view this as an incubation process that the small school may spin off a potential business, an ongoing enterprise in their community. It can have a range of reach. You do not have to be where the people are to be an entrepreneur today.

Goal 7: Restructure Low-Performing High Schools With Low Graduation Rates

- Provide incentive credit in accountability index to schools that:
 - Improve literacy and math skills.
 - Train all teachers on literacy (LDC) and math (MDC) strategies.
 - Provide students access to eb-based career pathways.
 - Develop partnerships with postsecondary institutions to create early advanced credential programs.
 - Develop structured work-based learning programs with regional employers that lead to advanced industry credentials.

Goal 7: Restructure Low-Performing High Schools With Low Graduation Rates

- Provide bonuses to schools for each student who:
 - earns an advanced industry credential in a high-demand field;
 - graduates college- and career-ready; and
 - earns college credits for two or more career pathway dual credit courses or two or more required academic courses.

Goal 8: Create a Guidance System of Career Information, Exploration and Advisement

HSTW
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Create a program of counseling for careers that engages students in ongoing career exploration and counseling activities, beginning in the middle grades.

Students reported:

- 24% had taken career exploratory class
- 18% participated in job shadowing, an internship or work-based learning
- 26% attended a career fair
- 44% attended a college fair
- 20% met at school with parents to talk about post-graduation plans
- 32% had same teacher or counselor as adviser all four years of high school
- 22% observed workers performing job tasks

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- A survey of over 3,600 seniors revealed that about 18 percent had a balanced set of school-based and community-based career and education exploratory experiences. See Page 17 of Handout. Four percent of the students had taken a career exploratory class and 32 percent had a teacher or counselor who had served as their adviser and mentor through all four years of high school. Twenty percent of the students and their parents met with someone at the school to talk about their post graduation plans.
- Several students had experiences in the community. Eighteen percent participated in job shadowing, an internship or work-based learning, while 22 percent of the students had observed established workers performing certain job tasks. Twenty-six percent of the students had attended career fairs, while 44 percent attended college fairs.
- In an October, 2014 Gallup poll survey of public school parents, 89 percent wanted a concerted effort by the school to provide their students with information about job opportunities available in the future.
- It appears that of the students surveyed, about 40 percent are participating in some type of part-time work during high school; 60 percent are not. Of those working, 90 percent were working to earn money for things they wanted, for college and to support the family. About 10 percent were working in a job related to their career goal as part of a planned program of study.

Goal 8: Create a Guidance System of Career Information, Exploration and Advisement

HSTW
MMGW/TCTW

Recommendations:

- Express in state policies that counselors are to lead and support the development of a career and educational guidance system that is curriculum based and involves using teachers as advisers. In schools without a counselor, a teacher will be designated to lead the effort. This will require some release time from teaching duties.

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- Creating structured pathways will require a major reconfiguration of the state's approach to guidance, teacher advisement and delivery of career and college information that helps students and parents make informed decisions about:
 - The sequence of academic and technical courses they need to take in high school
 - What is required to complete an advanced industry credential, what percentage of students currently complete such credentials and what kind of jobs and salary outcomes they can expect to achieve if they acquire them.
 - What percentage of students complete associate's degrees, the jobs and salaries associated with those degrees and what percentage of associate's degree earners transfer to bachelor's degree programs successfully.

Goal 8: Create A Guidance System of Career Information, Exploration and Advisement

HSTW
MMGW/TCTW

Recommendations:

- Require each middle grades and high school, over a three-year period, to develop a career and educational guidance plan that, at a minimum, would require:
 - developing annually, starting at least in grade eight, a career pathway program of study that is reviewed and revised yearly with each student and his or her parents. Pathways should be aligned to tentative career goals with a solid academic core; students with an interest in more traditional academic careers would take a concentration in either math or science or in humanities.
 - assigning each professional as a teacher adviser; and
 - scheduling one class period each week that allows the teacher to plan a lesson for advisees.

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- It is important that every student have a focus in high school, either a career focus, an academic focus or a fine arts focus. Students who have a focus and a purpose are more motivated, more likely to finish high school and are more successful.
- Structure school schedules to allow teachers to meet weekly with their student advisees. Ensure that students have the same teacher-adviser throughout all four years of high school. Provide counselors *and* teachers with tools and strategies for shifting students' thinking from merely choosing a college to also selecting a career focus for their postsecondary studies.

Goal 8: Create A Guidance System of Career Information, Exploration and Advisement

HSTW
MMGW/TCTW

Recommendations:

- Provide students with a progressive set of experiences to learn about careers, postsecondary learning opportunities and their own interests and aptitudes.
- Have each teacher to embed in their lesson career and future educational opportunities related to their discipline.
- Provide other extensive experiences such as internships, job shadowing, having students conduct research papers on careers in which they have an interest or interview adults in various career fields, etc.

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- Students and parents need information on how to get on and off educational pathways leading to postsecondary attainment and career advancement, starting with advanced credentials that students can earn after completing rigorous four-course career pathways in high school.

Goal 8: Create A Guidance System of Career Information, Exploration and Advisement

HSTW
MMGW/TCTW

Recommendations:

- Support the development of career and educational and guidance systems the state would:
 - Make initial grants to pacesetting high schools in each region to develop and implement a guidance system and provide the schools with the technical assistance needed to develop the plan.
 - Set a goal that all high schools have an approved and functioning guidance plan within three years.
 - Charge the appropriate state agency with developing Web-based materials that describe career opportunities in key industries; educational requirements for jobs in those industries; potential salaries; and distributing those materials to students, parents and schools by Web. Each school should provide students access to these in their media center.

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- Career and college planning information must show students and parents how the advanced credentials they earn in high school are part of a system of stackable credentials that also includes more advanced credentials, certificates and associate's and bachelor's degrees.

Goal 8: Create A Guidance System of Career Information, Exploration and Advisement

Recommendations:

- Support the development of career education and guidance systems the state would:
 - Charge two- and four-year colleges with associate's degree and occupational certificate programs to publish information on completion rates, jobs acquired, salaries and other essential information that will inform students and parents about the opportunities through programs they have.
 - Provide workshops for school teams to develop guidance plans and to train teacher as guidance leaders in schools that do not have a trained counselor.
 - Develop a repository of adviser lessons aligned to the needs of students appropriate for each grade level that teacher advisers can draw upon.

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Goal 9: Reform STARS and State Data and Reporting Systems

Correct structural problems in the state's course catalog, data collection and reporting systems that hamper the design, delivery and assessment of high-quality career pathways.

- Career pathways — and potential career pathway course sequences — are not clearly defined or laid out in STARS.
- Students and parents do not appear to have access to planning guides that lay out potential career pathway course sequences linking high school to postsecondary study.
- Some schools do not use STARS' course numbers, titles and descriptions.
- The state lacks a statewide system for reporting dual credit.
- New Mexico lacks a reliable system for collecting and reporting data on industry examination results.

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- The state does not have a way to distinguish between career explorers and those who are completing a structured planned career pathway aligned to postsecondary programs of study or to advanced work-site training.
- While the state has many students taking CTE courses, it appears that the average high school students take four, five or six CTE courses. They are often taking a elective set of courses at the most foundational level. There is not a formal definition of what makes up a four-course sequence in terms of the quality and depth of learning that should be in a career pathway program of study.

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Goal 9: Reform STARS and State Data and Reporting Systems

Recommendations:

- Design a common numbering, titling and description for academic and CTE courses.
- Establish a uniform statewide dual credit CTE course numbering, titling and reporting system that captures courses students complete and ensures the transfer of credits across institutions.
- Work with other states (e.g., the Workforce Data Quality Campaign) to advocate for the creation of a national database of industry certification examinations.
- Establish a multi-measure performance index to assess, track and report progress made by districts, schools and colleges offering career pathways.
- Use education and workforce data to align, assess and improve program quality.

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- The **Workforce Data Quality Campaign (WDQC)** is leading efforts to develop data-sharing agreements with industry bodies. Originally convened by the North Carolina Community College System and the California Community College Division of Workforce and Economic Development, the WDQC is a consortium of 21 states — including **Alabama, Delaware, Florida, Georgia, North Carolina, South Carolina, Texas and Virginia** — whose goal is to access exam data, establish joint data-sharing agreements and better align their pathways with available certifications and industry needs. The WDQC has urged the federal government to create a national credential directory.
- **Multi-measure performance index:** Ensure that the state’s accountability system captures – and includes mechanisms to reward – districts, schools, colleges and employers who partner to improve:
 - High school graduation rates
 - Student achievement of academic college readiness and academic and technical career readiness
 - Student achievement of indicators of academic, technical and workplace readiness in their career pathways
 - Career pathway completion
 - Work-based learning participation
 - Postsecondary enrollment and completion
 - Industry and postsecondary credential and degree attainment
 - 21st-century job attainment

Goal 10: Attract, Prepare and Retain High-Quality CTE Teachers

HSTW
MMGW/TCTW

Provide career pathway teachers with professional development that supports students' academic and technical readiness and supports new teachers from industry with fast-track induction programs to prepare them to teach in rigorous career pathway programs.

- Preliminary analyses of stakeholder survey data show that 40 to 50 percent of CTE teachers reported the need for staff development:
 - Embed related science content, literacy and math into assignments.
 - Design authentic project-based assignments that require academic and technical skills to complete.
 - Assess students' performance.
- Less than 15 percent of teachers reported having 40 hours of professional development on these topics in the past three years.
- Several school principals reported it was difficult to hire qualified CTE teachers with the current salary.

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- CTE teachers who give rigorous assignments that require students to apply literacy and math skills to complete see a significant increase in the percentage of students who meet college- and career-readiness standards. If this is to occur, not only must new teachers, but existing teachers as well need in-depth training. It takes at least 40 to 80 hours of staff development over time to change practices in classrooms.
- Further evidence that this is needed is reflected in the last three years. About 50 percent of teachers reported having 40 hours of professional development on embedding academic content into authentic assignments and being able to assess both technical and academic skills learned through the process.

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Goal 10: Attract, Prepare and Retain High-Quality CTE Teachers

Recommendations:

- Recruit nationally to hire high-quality CTE teachers in high-demand fields. In rural areas, share CTE teachers in high-demand areas among schools.
- Provide all new career pathway teachers with fast-track induction programs (e.g., SREB's *Teaching to Lead*) that prepare them to plan, teach and assess authentic project-based assignments.
- Require all CTE teachers to: a) meet the foundational academic standards expected of all teachers; b) hold the industry credential that they are preparing students to acquire; c) participate in professional development on designing authentic assignments that require the use of academic, technical, cognitive and 21st-century skills to complete; and d) work toward having all CTE teachers to hold at least an associate's degree in the career field they are assigned to teach.

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Teacher Induction: Allocate funds to provide new teachers from industry with fast-track induction programs that span the first 15 months of teaching and include two weeks to one month of paid employment before they enter the classroom. Ensure that fast-track induction programs are collaboratively designed and delivered by specially selected master teachers.

Professional Development: Work with postsecondary and industry partners and external providers to deliver research-based professional development to academic and CTE teachers on how to design instruction, assignments and assessments that integrate literacy, math and science with technical content. Help teachers integrate project-based learning, work-based learning and online teaching in their instruction.

Teacher Qualifications: Require secondary and postsecondary CTE teachers to hold the industry credentials they are preparing students to acquire. Provide training for teachers who do not have these credentials. Provide training for teachers who do not have these credentials and cover the training cost and the cost of them taking the exam to earn the credential. The state of Virginia has modeled this effort for secondary teachers, and it has paid dividends for them. North Carolina is requiring this of its occupational teachers.

Goal 10: Attract, Prepare and Retain High-Quality CTE Teachers

Recommendations:

- Provide intensive professional development to academic and CTE teachers on how to incorporate applied literacy and math into their assignments:
 - Literacy Design Collaborative (LDC) and Mathematics Design Collaborative (MDC)
 - Math-in-CTE, Science-in-CTE and Authentic Literacy professional development models
- Partner with employers to help CTE teachers periodically refresh their skills through required industry externships and work experiences.



Career Pathways Leading to Credible Credentials and Degrees:

Blurring the Line Between High School
and Postsecondary Studies

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SREB's 10 Indicators of Rigorous CTE Assignments

1. Do background research for a problem or project, such as reading technical article(s), before developing a plan or solution.
2. Predict outcomes based on observations or information provided.
3. Develop a logical argument for the solution to a problem or project.
4. Make inferences from information provided to develop a solution for a problem or project.
5. Use math to solve complex problems related to a CTE area.
6. Apply academic knowledge and skills to a CTE area.
7. Apply technical knowledge and skills to new situations.
8. Develop and test hypotheses.
9. Complete an extended project that requires planning, developing a solution or product and presenting results orally or in writing.
10. Use computer software or other technology related to a CTE area to complete assignments at least weekly.

Industry Certifications Earned in 2012-13¹	Number of Students Earning This Certification	From Two-Year Institutions	From Four-Year Institutions	From High Schools
Air Traffic Control	5	0	5	0
Automotive Service Technician	97	2	17	78
Aviation Maintenance Technology	5	0	5	0
AWS Advanced Welder	12	12	0	0
AWS Entry-Level Welder	14	12	0	2
AWS SENSE Entry Level Welder	2	0	0	2
BLS for Healthcare Providers	379	379	0	0
Certified Cisco Network Associate	3	3	0	0
Certified Medical Assistant	33	33	0	0
Certified Nursing Aide	195	20	157	18
Child Development Association Certification	34	0	22	12
Cisco Networking Academy - Networking for Home & Small Business	81	0	81	0
Cisco Networking Academy - Working at a Small to Medium Business or ISP	72	0	72	0
Cisco Networking Academy - Intro Routing & Switching in the Enterprise	31	0	31	0
CompTIA A+ Certification	5	5	0	0
CompTIA Network and Certification	2	2	0	0
CompTIA Security and Certification	2	2	0	0
Computer Maintenance Technician	13	0	13	0
Criminal Justice	11	0	11	0
EKG Technician Certification	5	0	5	0
Emergency Medical Basic	2	0	2	0
Emergency Medical Intermediate	2	0	2	0
Emergency Medical Technician	65	0	65	0
Engineering Technology	39	0	39	0
EPA Sect 608	41	41	0	0
EPA Sect 608 Clean Air Act Certification Core	8	0	8	0
EPA Sect 608 Clean Air Act Certification Type 2	2	0	2	0

¹ Source: Data received from NMPED on industry credentials earned by students in Perkins-funded programs in 2012-13. Researchers drew upon SREB's **Criteria for the Review of Industry Certification Examinations** to select those industry certification examinations from the list received from NMPED that can be considered of high quality on their own or when bundled in a series with other examinations.

Industry Certifications Earned in 2012-13¹	Number of Students Earning This Certification	From Two- Year Institutions	From Four- Year Institutions	From High Schools
EPA Sect 608 Clean Air Act Certification Type 3	4	0	4	0
EPA Sect 608 Clean Air Act Type One Certification	5	0	5	0
EPA Sect 608 Clean Air Universal Certification	5	0	5	0
Fire Fighter 1 and 2	60	0	60	0
Fire Protection Technology	5	0	5	0
Hazardous Materials Awareness & Operations	60	0	60	0
HOST Credentials from the National Restaurant Association Manage First Program	208	0	208	0
IC Certification	7	7	0	0
IPCj-00a & IPC Soldering Certifications	23	0	23	0
NCCER Carpentry	53	0	0	53
NCCER Core Curricula	24	0	24	0
NCCER Electrical	5	0	0	5
NCCER Green Environment	19	0	19	0
NCCER HVAC	130	0	0	130
NCCER Intro to Power Tools	6	0	0	6
NCCER Masonry	2	0	0	2
NCCER Painting	8	0	8	0
NCCER Painting Level 2	8	0	8	0
NCCER Plumbing	2	0	0	2
NCCER Welding	28	0	0	28
Nursing	16	0	16	0
Occupational Therapy	14	0	14	0
Pharmacy Technician	6	0	6	0
Phlebotomy Technician	19	0	19	0
PLTW End of Course	41	0	0	41
ProStart Certification	13	0	0	13
Radiographic Technology	13	0	13	0
Refrigeration Technician	16	0	16	0
Respiratory Therapy	5	0	5	0
ServSafe Certification	16	0	14	2
Sonography Certification	7	0	7	0
Vehicle Extraction	60	0	60	0
Veterinary Assistant Technician	8	0	8	0
Welding Technician	8	0	8	0
TOTAL	2,064	518	1,152	394

ADVANCED CAREER (AC) INNOVATIONS IN SCIENCE AND TECHNOLOGY PATHWAY

Advanced Career (AC) Innovations in Science and Technology curriculum is designed to develop technological literacy and stimulate interest in pursuing a career in science, technology, engineering or mathematics (STEM). This STEM program provides students with the knowledge and hands-on experiences to be successful in the new global work force.

Students will learn to work in teams, think critically, identify problems and propose solutions to design problems. Students will learn to read and comprehend complex technical materials and communicate effectively their understanding of these materials in written, oral and electronic formats. Further, they will learn to apply math understanding and science concepts and use technology to effectively solve real-world challenging problems. Through project-based learning, students will explore the future of science and technology and learn to apply those habits of behavior unique to professionals in the field to become successful students, workers and professionals in the field.

For smaller schools that may not have programs that include several technology options for their students, this AC curriculum is designed to offer a real work experience with rigorous STEM related learning activities that introduce science, math, literacy, and technology. These subject areas are woven into the instruction in solving the problems of an authentic scenario working with career technical education ideas.

The Advanced Career (AC) Innovations in Science and Technology Curriculum includes four courses that introduce six projects in each course of the curriculum.

AC projects raise the levels of both academic knowledge and technical skills in the context of real job (real world) situations. Students actually practice the skills and apply the knowledge of people in a career field selected by state leadership as having strategic importance to the state. AC projects thus become test drives for careers. Through engaging assignments and collaboration with industry and business leaders, AC courses provide a pathway for students to move into strategically important career fields.

Important career fields that have been identified that need the educational skills developed in the instructional activities of the Innovations in Science and Technology Curriculum are the following: Construction and Building Inspector, Environmental Engineering Technician, Mechanical Tech Technician, Electrical Engineering Technician, Civil Engineering Technician, Surveyor, Industrial Engineer, Mechanical Engineer, Civil Engineer, Agricultural Engineer, Manufacturing Engineer, Chemical Engineer. Many of these career programs are supported by the Community and Technical College System through their offering of Associate Degrees and Certificates of Study. In addition, many students are able to

find employment as a High School graduate with their high level of skills once completing this STEM curriculum of study. This career pathway gives students the opportunity to earn a meaningful credential driven by workforce opportunities.

Sample project summaries from the Innovations in Science and Technology Curriculum with their project titles are given on the following page. Also given are the six project titles from each of the four courses of the curriculum.

Advanced Career - Innovations in Science and Technology – Short Summaries of Sample Projects

1-1 Science of Survival – This project engages students in building a device to generate electricity from common, household objects. Trapped in cabin, students must generate enough electricity to power a cell phone. Students learn aspects of mathematics related to electricity, science of electricity and engineering design. The authentic role is an engineer, and the authentic audience consists of technology specialists and engineers.

1-2 Earthquake Proof Shelter – Structural analysis of buildings and the creation of earthquake proof shelters are at the heart of this project. Students learn essential aspects of building design, testing forces and stresses, and creating a building that is both functional in form and safe in an earthquake. The authentic role is an engineer, and the authentic audience consists of city inspectors, architects and civil engineers.

1-3 Cleaning up the Water Supply – Water testing, analysis and planning for a safe water supply are the focus of this project. Students design testing methods, work with local water plant officials, and create a plan to enhance water quality. Investigations into testing water require students to create and test their own water filter. The authentic role is an environmental engineer, and the authentic audience consists of a local government panel.

1-5 Laser Perimeter System – Using science and technology to secure an area, students build a laser perimeter warning system. Students learn engineering design, aspects of electronics and lasers, and simple programming to create a warning system. Students test and refine their system based on the project parameters. The authentic role is an electrical engineer, and the authentic audience consists of engineers and engineering professors.

2-1 When the Levee Breaks – Students learn to use GPS and topography to select the best places for levees in their community. This project requires that students design a levee system that mitigates flooding and pollution and allows a functional public space. Students test water quality and scout locations for a levee. The authentic role is environmental engineer, and the authentic audience is made up of an advisory panel of local officials.

2-2 Addicted to the Grid – This project allows students to gain knowledge of electricity generation as they build a human powered generator. Students create a generator for the purpose of powering a small appliance, such as a laptop computer.

The authentic role is an electrical engineer, and the authentic audience consists of engineers and electrical experts.

2-3 Biodiesel Byproduct – Through manufacturing biofuel, students learn that there are particular useful waste products. Students design a method of using byproducts from biofuel manufacturing to create a new product. Quality testing, precise measurement and experimental design all play a role in this project. The authentic role is a chemical engineer, and the authentic audience consists of chemists, chemistry educators, and chemical manufacturing experts.

2-5 Bioinformatics and Forensics – Application of science and technology to solving crimes is the focus of this project. Students learn specific crime scene techniques to investigate the crime scene. Lab science plays a role in this project as students learn laboratory techniques such as sample analysis and genetic testing. The authentic role is a forensic scientist, and the authentic audience consists of local law enforcement officials, crime scene investigators and forensic scientists.

Innovations in Science and Technology Curriculum –Project Titles for each of four courses:

Course One – The Science of Survival, The Earthquake Resistant Shelter, Cleaning Up Our Water Supply, Wave Energy, Laser Perimeter System, Mail Delivery System.

Course Two – When the Levee Breaks, Addicted to the Grid, Biodiesel Byproduct, Strength Through Recycling, Bioinformatics and Forensics, Improved Medical Device

Course Three – Did You Hear That, Bicycle Security and Transport System, Lemons to Lemonade, You are What You Eat, 21st Century or Bust, Want to Play a Game

Course Four – Envision This – A Remote Sensing Project, Toy Research and Development, Ethanol Fuel – Corn is for Eating, Vacation Automation, Elevation Automation, Operation Pet Safe

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New Mexico Secondary Courses and Postsecondary Programs, By Career Cluster

	Secondary Courses*	Postsecondary Programs**
Agriculture, Food & Natural Resources	27	10
Architecture & Construction	29	23
Arts, A/V Technology, & Communications	28	23
Business Management, & Administration	24	35
Education & Training	2	9
Finance	7	9
Government & Public Administration	7	1
Health Science	34	76
Hospitality & Tourism	11	13
Human Services	30	20
Information Technology	27	29
Law, Public Safety & Security	6	35
Manufacturing	20	20
Marketing Sales & Services	24	6
Science, Technology, Engineering & Math	28	35
Transportation, Distribution & Logistics	16	14
TOTAL	320	358

Sources: * STARS Catalog, New Mexico Public Education Department. ** Course Catalogs, State Postsecondary Institutions Offering Two-Year and Four-Year Programs.

SREB's Criteria for the Review of Industry Certification Examinations

Essential Criteria:

- standardized
- independently graded
- knowledge-based
- available nationally
- provides recognized credential
- results available immediately
- cut scores exist
- relevant to employers / offers evidence of link to available jobs
- correlations are available

Necessary Criteria:

- Preparation and classroom contact hours equal or exceed one Carnegie Unit
- Blueprint information and sample questions represent a 12th-grade level of work

Desirable Criteria:

- Follows appropriate psychometric and test development procedures
- High quality is continually maintained
- Includes accommodations
- Protects candidate's identity

Southern Regional Education Board. *Measuring Technical and Academic Achievement: Employer/Certification Examinations' Role in High School Assessment*. SREB, 2009.

Computer-Adaptive Testing

A growing number of industry-based certification examinations use computer-adaptive test (CAT) technology. This delivery strategy tailors the questions posed to the candidate according to the person's skill level. As a test-taker answers each question, the correctness of the response governs the nature and difficulty of the next question the candidate receives. Once the software has determined the candidate's skill in one area, it moves to another until all areas of the test are covered and the confidence level concerning the candidate's accomplishment has been reached. This strategy greatly reduces the duration of the examination and reports results more quickly and with greater precision. The result is that an examination that may last four hours in paper-and-pencil format can be completed in less than one-hour with computer-adaptive testing, and results are available immediately. Under this method, the length of an examination or the number of questions posed is an irrelevant measure of the quality of the examination.

Project Criteria Applied to Examinations

Before work began, we met with several state education leaders to discuss the project objectives and learn from state experience in implementing alternative CT examinations. Some leaders expressed concerns about what was perceived to be uneven rigor of industry-based examinations and about the amount of course work required and available for proposed examinations. The need for direct course linkage to industry examinations, substantial contact hours and meaningful course work, and an emphasis on industry or employer endorsement helped to shape the criteria the project team established.

We established three levels of criteria for reviewing examinations to propose as qualifying alternative tests: essential criteria, necessary criteria and desirable criteria.

Essential Criteria

Essential criteria are qualities that all exams should possess.

- **The examination is standardized.** The examination must be administered under strict testing conditions such that students will have an equal opportunity to answer questions, the testing time provided is equal for all students, the examination is proctored by trained test administrators, and the validity and reliability of the examination and its psychometric support meet standard and rigorous specifications. Furthermore, if multiple forms of the same examination are available, the results are placed on a common reporting scale using generally accepted procedures of statistical equating so that a student taking either form would perform equally well.
- **The examination is independently graded:** The process of grading and reporting results is the direct responsibility of a third party. A great majority of the examinations reviewed require the use of a computer (or computer software) linked to a central remote location beyond the bounds of school or state property. The student or applicant logs on to the computer and links with the testing software. At the conclusion of the examination, the results are immediately presented on the computer screen.

ESSENTIAL CRITERIA

- Examination is standardized
- Examination is independently graded
- Examination is knowledge-based
- Examination is available nationally
- Examination provides recognized credential
- Results are available immediately
- Cut scores exist
- Examination represents employer relevance
- Correlations are available

Other modalities alert the student to log on to the test owner's Web site to receive the test results. Paper-and-pencil examinations require the traditional returning of answer sheets and booklets to the test provider for scoring and reporting.

It is important to note that owners of most industry-based examinations employ a separate testing agency to register students, administer examinations, score responses and report the results. They use the same organizations that many owners of traditional academic examinations use.

- **The examination is knowledge-based:** This general term is used to cover two definitions for this criterion. First, appropriate knowledge and skills are required for successful completion of the examination, meaning that questions can be answered not by applying common sense alone, but by demonstrating knowledge gained through a planned curriculum and extensive worksite learning. Secondly, examinations are knowledge-based in that they are not performance-based. Allowances were made for industry examinations that required both a written portion and a practical or performance segment if the written portion of the examination met the essential criteria. Examinations that are entirely performance-based, however, are not included in the recommendations. These examinations might be excellent alternative examinations that faithfully reflected the requirements in the field, but fell short of providing a paper-and-pencil or computer-based measurement of a candidate's content knowledge in the given career field.
- **The examination is administered nationally or internationally.** For an examination to be eligible as an alternative examination, it must be available for use beyond the boundaries of a single state. Examinations offered by a state can be included if they are available for use by other states. This criterion exists to ensure that students completing a concentration in CT studies take reputable examinations known within the industry, independent of local or state credentialing.
- **The examination results in a recognized credential.** This stipulation required careful review of examination certification programs to separate industry-valued certifications and endorsements from those with value limited to recruitment for an association membership. A number of examinations met all the essential criteria in terms of rigor, depth and breadth of knowledge and high psychometric quality, but do not issue certificates or are not endorsed by an employer- or employee-based organization. However, in all other respects, these examinations verify achievement and are of quality equal to or higher than others that do award certificates, and have thus been provisionally recommended.
- **The examination results are available immediately.** In nearly all the cases of the recommended and provisionally recommended examinations, the results are readily available or prepared within 30 days.
- **The examination cut scores were set using a standards-setting or other logical process** and are reported. This criterion originally stipulated only that cut scores be reported; however, we found several examinations that did report cut scores, but those scores were set arbitrarily, rather than through a standards-setting process. This issue is compounded by the general practice of industry-based examinations to report only a "pass" or "fail" result with little or no explanation. Thus, the criterion was altered to include the stipulation that cut scores not only be reported, but also be set using a logical process.
- **The examination represents employer relevance.** Employer relevance requires that test content relate directly to the knowledge and skills required in the field, such that successful completion of the examination might qualify a candidate for meaningful employment.
- **Examination correlations to academic studies are apparent.** We recommended only examinations with sufficient linkage with traditional academic subjects. Accordingly, where possible, we identified the types of mathematics, science, language arts or other academic skills that students would need to complete the examination successfully. A nursing or dental assistant examination, for example, would require knowledge of human anatomy, some chemistry and some mathematics. A manufacturing technician, welder or construction inspector examination might require algebra, trigonometry and physics; knowledge of metals, machine calibrations and conversions; and the ability to read charts, graphs and blueprints. These academic analogs are noted in the examination profiles wherever possible.

Necessary Criteria

Necessary criteria were established to address the concept of *rigor*, defined as “a level of difficulty that is appropriate for the grade level and that meets state and/or national standards.” The rigor of an alternative examination must equal or exceed that of current graduation examinations.

The intent of this study is not to provide an easier alternative to academic examinations, but rather to recognize students’ accomplishments and applied academic and technical knowledge and skills in a recognized CT field. Therefore, we analyzed examinations to determine whether some industry examinations would be too narrow in scope and coverage or too simple to match the challenge of end-of-course academic examinations. For example, a certification examination for keyboard skills that requires instruction time of 30 to 90 hours would not be recommended as an acceptable alternative examination.

NECESSARY CRITERIA

- Preparation and classroom contact hours equal or exceed one Carnegie Unit.
- Blueprint information and sample questions represent a 12th-grade level of work.

- **Recommended preparation and classroom contact hours are equal to or greater than a single Carnegie Unit.** This minimum threshold ensures depth and breadth of the knowledge and skills necessary for successful completion of the corresponding examination. To judge compliance with this expectation, we asked state career/technical staff in one state to identify the courses and classroom contact hour they consider to be appropriate preparation for each reviewed industry examination. In evaluating more than 200 examinations, we quickly discovered that, far from being end-of-course examinations, the industry-based examinations were most often end-of-program (or near-end-of-program) examinations. As a consequence, the classroom contact hours and courses far exceeded the single Carnegie Unit minimum that corresponded to a given academic course. For example, the courses listed in one state for adequate preparation to take the American Design Drafting Association Computer-Aided Design (CAD) examination amount to 1,020 contact hours. No single course will prepare the student for this examination. Rather, at some point during the student’s preparation, the guiding instructor may suggest that the student is ready to take the examination, based on the known requirements of the examination.

COURSES REQUIRED FOR CAD DESIGN ELECTRONICS SPECIALIST

Fundamentals of CADD	120
Drawing and Document Management	45
Advanced Presentation Graphics Animation	120
Principles of CAD Design	165
CAD Electronics Introduction	120
CAD Electronics Level 1	60
CAD Electronics Level 2	60
CAD Electronics Level 3	60
CAD Electronics Level 4	120
CAD Electronics Level 5	120
Workforce Staging	30

The courses and classroom contact hours, which can be found in the Test Information Sheets, describe the preparation the student would likely need for the designated examination. Upon the advice of their teachers, students might take the certifying examination before completing their course of study, after the first 150 hours of class time², because they may have gained the necessary knowledge and skills at nearly any point along the way. It is important to note that the length and packaging of course content may vary from state to state. Some courses are of shorter duration and are considered modules or half-courses that may cover a specialized topic. Thus, we focused the minimum preparation needed in terms of course time (150 contact hours), rather than number of courses, to signify a substantial classroom opportunity to learn career-related content in depth.

- **The blueprint information and sample examination questions reveal a level of work and understanding appropriate for the high school level.** We stipulated that examination review would include, at a minimum, a study of blueprint information and sample questions found on Web sites and in consultation with examination representatives. The sample questions, blueprints and conversations with examination owners enabled us to understand the complexity of terminology and the technical materials that students would need to read and understand to answer examination questions. A review of the documents and other information provided clues to the academic content that would be required in the examination, allowing us to ascertain a level of work and understanding consistent with what might be expected of a junior or senior in high school.

Desirable Criteria

The final criteria used in this review were designated as *desirable criteria*. These criteria were established to ensure that a certain threshold of test quality, development and support was met. We were concerned about the process of test development, the nature and role of test development committees, statistical maintenance and support, and accommodations for non-native speakers and people with disabilities. Information was also obtained about the steps taken to protect examination security and verify test candidates' identity. A brief data collection questionnaire was created to document as much information as was available about the technical aspects of each examination.

DESIRABLE CRITERIA

- Follows appropriate psychometric and test development procedures
- High quality is continually maintained
- Includes accommodations
- Protects candidate's identity

It is important to note that although this brief technical review was based on a selected portion of the standards set forth by the American Psychological Association, this limited verification cannot be considered to be a thorough psychometric review or audit. Not only was such an exhaustive review beyond the scope of this report, the proprietary nature of the vast majority of the examinations reviewed prevented adequate access to the examinations and technical manuals or reports to complete such a review. During telephone conversations with owner representatives, enough information was gained in most cases to enable us to verify that responsible psychometric and test development procedures were being followed.

² One Standard Carnegie Unit is defined as 150 classroom hours for this report.

Advanced Career Pathway Programs

Advanced Career pathway programs is a new approach to career and technical education to prepare students better for more options after high school – jobs, advanced training, community/technical college or higher. The AC curricula combine college-ready academic and technical content in a four-course sequence designed around authentic, project-based assignments and linked to high-demand career fields in the nation.

Aerospace Engineering — In this curriculum, students will explore the design, building, testing and analyzing the forces and physical properties of planes, rockets and unmanned vehicles. They will utilize tools such as Excel, LabVIEW and sensing systems to collect and analyze data. Students will study materials and structures, systems and the virtual world. In addition, students will work collaboratively, manage projects, be creative and innovative, think critically, and solve problems as well as propose solutions to design problems. Further, they will apply literacy, mathematics and science concepts and use technology to solve real-world problems with business and industry partners. As they explore the future of aerospace, they will learn those habits of behavior and mind unique to the field.

Clean Energy Technology — This program enables students to apply fundamental science and operating principles of clean energy systems to authentic problems. Such problems involve motors and generators, photovoltaic systems, water and energy conservation, wind turbines, biofuel generation, bioreactors, water power, energy harvesting, fuel cells and nuclear power. Students will master industry-standard simulation and modeling software and use web-based applications. Students will discover how the perceptions of consumers, manufacturers, technologists and regulators shape and affect the rate and scale of clean energy technology adoption.

Energy and Power — In this program, students will research, design and build a series of authentic, hands-on projects that will enable them to understand the interplay of the generation, distribution and use of energy. Through project work, students will:

- understand the five types of energy — mechanical, heat, chemical, electromagnetic and nuclear;
- learn about power generation and distribution including turbines, motor/generator sets, renewable and non-renewable energy generation, and electrochemical systems such as batteries;
- gain knowledge and skills about single- and multiple-phase generation and distribution systems, transformers, and high voltage AC and DC systems;
- work with mechanical, fluid and electrical systems; and
- understand power generation and environmental issues.

Global Logistics & Supply Chain Management — This career field connects internal functions of an organization with other organizations around the globe and requires critical thinking and problem solving in order to coordinate various components that can be separated by thousands of miles or even just a few feet inside a building. In this curriculum, students will develop solutions to authentic logistics problems that businesses regularly face, on both domestic and international levels. Students will learn the complexities businesses deal with in securing raw

materials from distant locations, moving them across multiple borders, receiving them in various ports, transporting them to warehouses, storing them efficiently or employing the just-in-time model, and then distributing them to customers through networks that balance transit time with cost.

Health Informatics — The health informatics pathway introduces students to the discipline through a series of authentic projects that merge information science, computer science and health care. Students will design, manage and use technology to analyze data and information that can inform better health-care decisions and, in turn, improve the delivery of health-care services. Students will use information technology, data analysis software and statistics to address a range of health related topics. They will collect, analyze and prepare data reports targeted to a specific audience. Students will make sense out of data that can serve to inform the general welfare and quality of health care in the nation.

Informatics — Informatics is the process of taking raw data and converting it into new knowledge that can be applied to any field while considering its impact on individuals, organizations and society. For example, collection of data on shopping habits of customers will lead to the targeted marketing of products that customers will purchase. The ability to collect vast amounts of information cost effectively is changing the way business manages information, create knowledge, and make decisions. Students in this program will have the opportunity to explore such systems and more through authentic project experiences.

Innovations in Science and Technology — This pathway program will develop students' technological literacy and stimulate their interest in pursuing a STEM career. Through project-based assignments, students will explore the future of science and technology, and learn to apply the habits of mind and behavior unique to professionals in the field. Students will learn to work in teams, think critically, identify problems, and design and test solutions. Students will learn to read and comprehend complex technical materials and communicate effectively their understanding of these materials in written, oral and electronic formats. Further, they will learn to apply math and science understandings, and use technology to effectively solve challenging problems.

Integrated Production Technologies — This pathway program engages students in using innovative industry-driven technologies to imagine and design new and improved products. Students will apply what they learn in physics, chemistry and biology to real-world projects using emerging, cutting-edge materials. Students will reengineer existing products to reduce the energy and material costs required to produce them, invent new products, and create more durable and efficient products using automated computer-aided design and manufacturing programs. Working in teams and in online communities with industry professionals, students will apply engineering design processes and engage in 3-D computer-aided design, documentation, prototyping, testing and analysis. Students will also design modern production systems, create energy efficient work cells and explore robotics with the programmable logic controllers and computer numerical control systems used in the world's leading industries.

ACT-Defined STEM Majors and Occupations by Area

Science Majors/Occupations	
Agronomy and Crop Science	Medical Laboratory Technology
Animal Sciences	Medical Radiologic Technology
Astronomy	Medicine (Pre-Medicine)
Atmospheric Sciences and Meteorology	Nuclear Medicine Technology
Biochemistry and Biophysics	Nursing, Practical/Vocational (LPN)
Biology, General	Nursing, Registered (BS/RN)
Cell/Cellular Biology	Optometry (Pre-Optometry)
Chemistry	Osteopathic Medicine
Ecology	Pharmacy (Pre-Pharmacy)
Environmental Science	Physical Therapy (Pre-Physical Therapy)
Food Sciences and Technology	Physician Assisting
Forestry	Respiratory Therapy Technology
Genetics	Surgical Technology
Geological and Earth Sciences	Veterinarian Assisting/Technology
Horticulture Science	Veterinary Medicine (Pre-Vet)
Marine/Aquatic Biology	Engineering and Technology Majors/Occupations
Microbiology and Immunology	Aeronautical/Aerospace Engineering Technology
Natural Resources Conservation, General	Aerospace/Aeronautical Engineering
Natural Resources Management	Agricultural/Bioengineering
Physical Sciences, General	Architectural Drafting/CAD Technology
Physics	Architectural Engineering
Science Education	Architectural Engineering Technology
Wildlife and Wildlands Management	Architecture, General
Zoology	Automotive Engineering Technology
Computer Science and Mathematics Majors/Occupations	Biomedical Engineering
Actuarial Science	Chemical Engineering
Applied Mathematics	Civil Engineering
Business/Management Quantitative Methods, General	Civil Engineering Technology
Computer and Information Sciences, General	Computer Engineering
Computer Network/Telecommunications	Computer Engineering Technology
Computer Science and Programming	Construction Engineering/Management
Computer Software and Media Application	Construction/Building Technology
Computer System Administration	Drafting/CAD Technology, General
Data Management Technology	Electrical, Electronic, and Communication Engineering
Information Science	Electrical/Electronics Engineering Technology
Management Information Systems	Electromechanical/Biomedical Engineering Technology
Mathematics Education	Engineering (Pre-Engineering), General
Mathematics, General	Engineering Technology, General
Statistics	Environmental Control Technologies
Webpage Design	Environmental Health Engineering
Medical and Health Majors/Occupations	Industrial Engineering
Athletic Training	Industrial Production Technologies
Chiropractic (Pre-Chiropractic)	Mechanical Drafting/CAD Technology
Dentistry (Pre-Dentistry)	Mechanical Engineering
Emergency Medical Technology	Mechanical Engineering Technology
Food and Nutrition	Military Technologies
Health/Medical Technology, General	Nuclear Engineering
	Quality Control and Safety Technologies
	Surveying Technology

National STEM Report

Notes

1. Students were assigned to one of three STEM cohorts: Expressed and Measured, Expressed Only, or Measured Only. These cohorts were based on the pairing of Expressed and Measured STEM interest types, where:
 - Students with expressed STEM interest planned on a STEM major or occupation following high school.
 - Students with measured STEM interest had a highest ACT Interest Inventory score in Science or had a highest ACT Interest Inventory score in Technology and a second-highest score in Science.

Within each STEM cohort, students were also assigned to one of four STEM areas: Science, Computer Science and Mathematics, Medical and Health, or Engineering and Technology. STEM areas for students in the Expressed and Measured Interest cohort and the Expressed Interest Only cohort were based on the STEM area of students' planned major. If planned major was not STEM, then the STEM area of their planned occupation was used. For students in the Measured Interest Only cohort, STEM area was based on a crosswalk between ACT Interest Inventory score profile and planned major. The crosswalk was created from a national sample of undergraduate students with a declared major and a grade point average of at least 2.0. (For more information about the crosswalk, go to www.act.org/emtrends/12/interestmajor.html.)

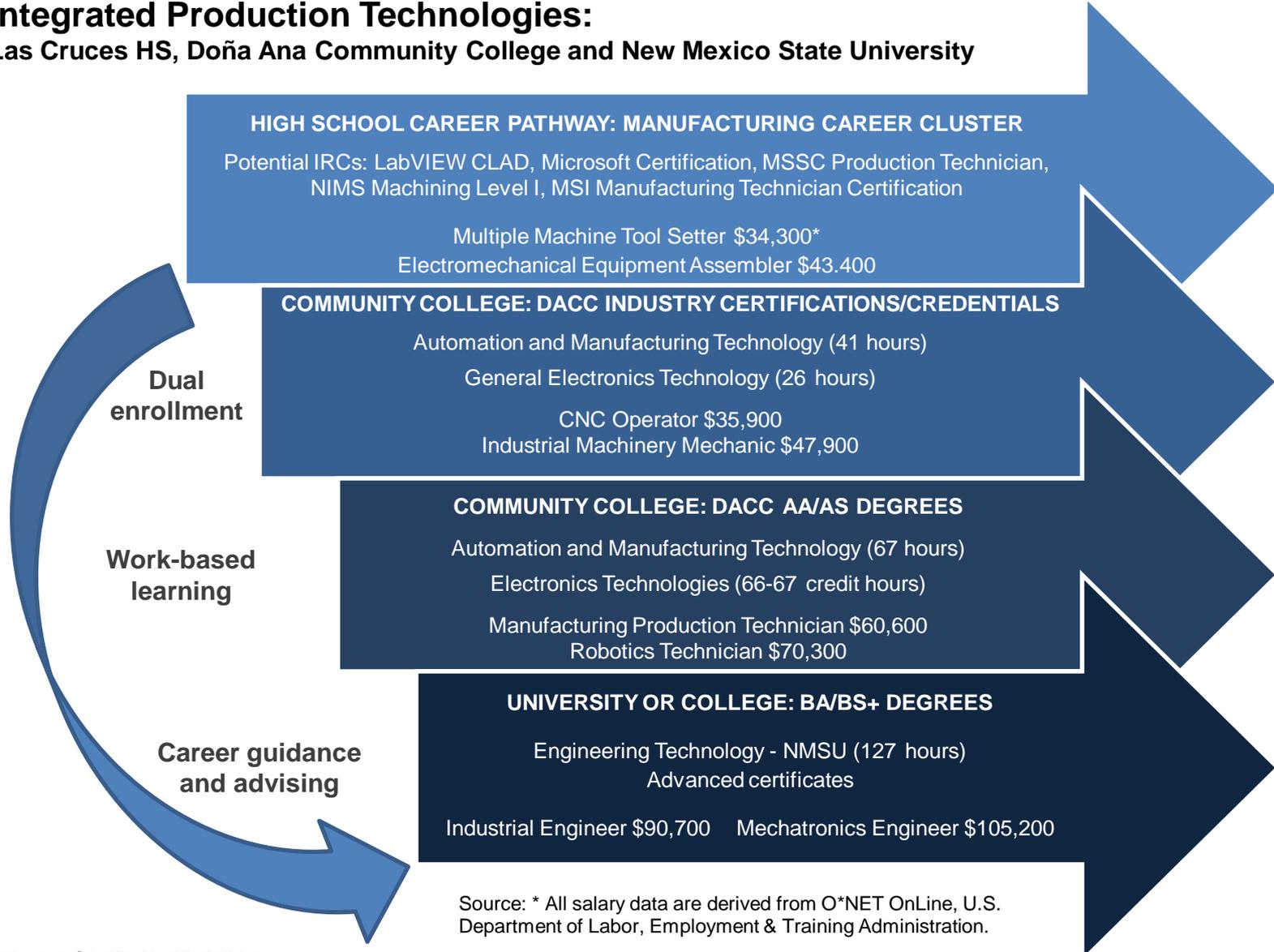
2. When individuals register for the ACT, they are asked to choose a college major they plan to enter as well as an occupational choice from a list of 294 major and occupational titles. Of these 294 titles, 93 have been identified as STEM related. Assignment of ACT titles to STEM titles was conducted by an expert panel of ACT staff members with knowledge of labor market trends and postsecondary academic programs. Panel decisions were informed by three sources of information: (1) STEM-designated occupations from the US Bureau of Labor Statistics (BLS), (2) STEM-designated degree programs from US Immigration and Customs Enforcement (ICE), and (3) ACT Interest Inventory score profiles for students planning to enter the major/ occupation. ACT titles were assigned to STEM when both the corresponding BLS and ICE titles were included in STEM or when the corresponding BLS title was included in STEM and the profile of measured interests of students planning to enter this occupation peaked on the Science and Technology scale. These two guidelines accounted for 89 of the 93 ACT titles assigned to STEM. The remaining four titles were assigned to STEM based on the judged intensiveness of their math and science coursework (major) or work tasks (occupation). ACT titles in the Social Sciences were excluded from this STEM list because many STEM taxonomies do not include majors and occupations in this field.

Projected Job Growth Rate in Major Industry Sectors for New Mexico by Georgetown University

Industry	2010 Jobs	2020 Jobs	Growth Rate (%)
Agriculture, Forestry, Fishing and Hunting	24,770	27,220	10
Mining, Quarrying, and Oil and Gas Extraction	21,550	29,650	38
Utilities	3,770	4,200	11
Construction	51,610	56,400	9
Manufacturing	29,480	31,210	6
Wholesale Trade	22,010	25,500	16
Retail Trade	91,250	106,830	17
Transportation and Warehousing	22,200	26,150	18
Information	13,920	14,450	4
Finance and Insurance	30,340	37,790	25
Real Estate and Rental and Leasing	32,790	40,960	25
Professional, Scientific, and Technical Services	65,410	70,440	8
Management of Companies and Enterprises	4,560	5,100	12
Administrative and Support and Waste Management and Remediation Services	45,340	49,190	8
Educational Services	14,220	18,340	29
Healthcare and Social Assistance	98,790	128,230	30
Arts, Entertainment, and Recreation	19,200	21,600	12
Accommodation and Food Services	66,700	83,410	25
Other Services (except Public Administration)	35,200	39,910	13
Government	162,660	191,250	18
TOTAL	855,820	1,007,800	18
<p>Source: Center on Education and the Workforce. <i>Recovery: Job Growth and Education Requirements Through 2020</i> (State Report). June 2013.</p>			

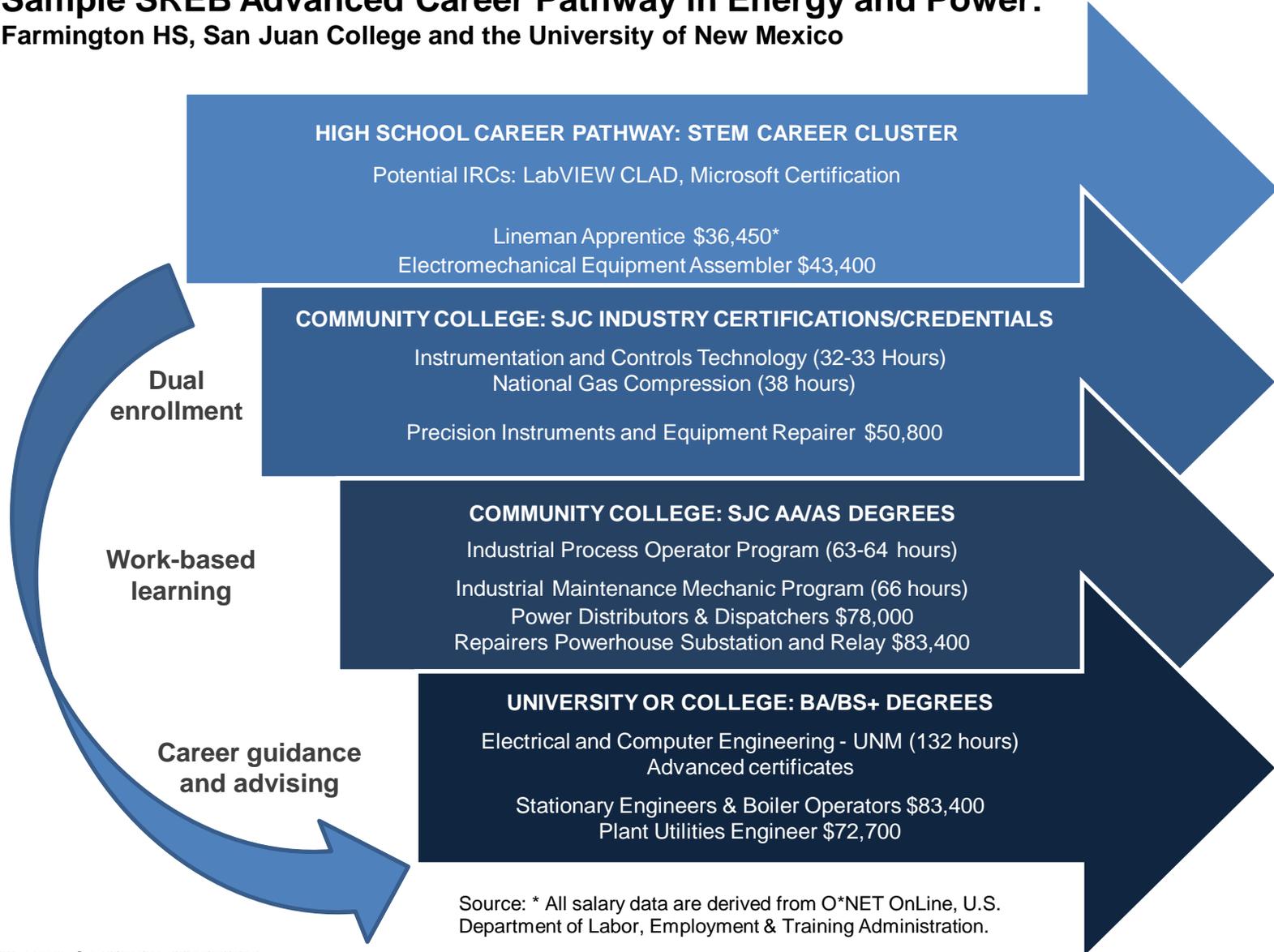
Sample SREB Advanced Career Pathway in Integrated Production Technologies:

Las Cruces HS, Doña Ana Community College and New Mexico State University

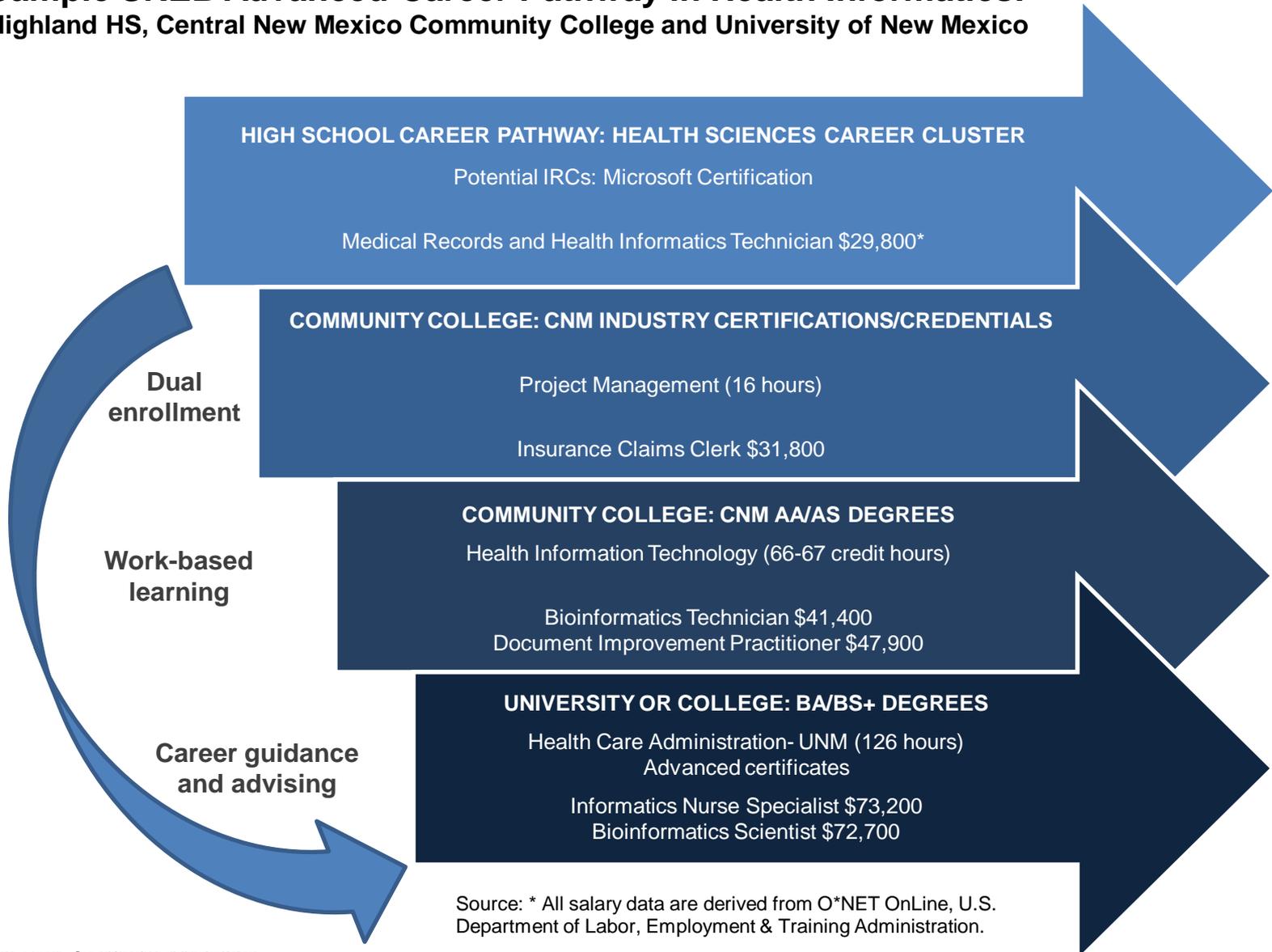


Source: * All salary data are derived from O*NET OnLine, U.S. Department of Labor, Employment & Training Administration.

Sample SREB Advanced Career Pathway in Energy and Power: Farmington HS, San Juan College and the University of New Mexico



Sample SREB Advanced Career Pathway in Health Informatics: Highland HS, Central New Mexico Community College and University of New Mexico



Goal 7: Create a career guidance system of information, exploration and advisement

Career Information, Exploration and Advisement		
Response	Indicators	Percent
Intensive	3 - 7	18%
Moderate	2	41
Low	0 - 1	41

Source: High Schools That Work New Mexico Student Survey (administered in Fall of 2014)

**Career Pathways Leading to Credible Credentials and Degrees
New Mexico
December 18, 2014**

Goal 1: Build rigorous, relevant career pathways that align with postsecondary education and training and workplace opportunities

From a distance, as SREB has worked with New Mexico for the last decade, let me make a personal observation: I am most impressed with the progress you are making.

There is strong evidence that the state is making progress: You have made greater gains on NAEP (National Assessment of Educational Progress) eighth-grade reading and math scores than the nation since 2007. However, less than half of your students are ready as ninth graders to do 21st-century math or to read and analyze complex texts. As you move New Mexico into the 21st-century economy, you have remaining challenges both with your CTE programs and with the quality of academic courses you offer. **High-quality CTE and college-ready academics go hand-in-hand in preparing students for 21st-century opportunities.**

By coupling rigorous CTE with embedded academics and continuing your efforts to support your teachers in engaging students in reading grade-level texts at all levels, and by teaching math with a focus not just on procedures but on reasoning, understanding and application, I am confident that you will continue the state's journey of progress.

In its preliminary analyses of course-taking data, SREB has found that New Mexico high school students are taking a lot of CTE courses, but few are completing high-quality structured career pathways linked to advanced industry credentials or continued study in the same career field at the state's two- and four-year postsecondary institutions.

Based on SREB's Fall 2014 survey of 3,686 New Mexico senior CTE students:

- 30 percent or less of those students reported that they experienced rigorous assignments that covered several days or weeks of classroom time and required them to apply a mix of academic, technical, cognitive, technological and workplace readiness skills to complete.
- 46 percent of those students reported taking four or more CTE courses.

Several sources of evidence support our conclusion that not enough students are completing high-quality structured career pathways.

First, based on SREB's review of the state's industry credential completion data, it appears that only about 394 high school students took and passed industry certification exams that appear to be credible.

Second, our educational pipeline analyses show that 48 out of 100 New Mexico high school students who start ninth grade have no real pathways to well-paying 21st-century

jobs that require some postsecondary credential or degree in the state's high-growth industries. That 48 includes 30 students who will not graduate on time from high school, as well as 18 who will not immediately enroll in some form of postsecondary education after graduating.

New Mexico needs to provide all high school students in the many diverse regions of the state with access to high-quality career pathways that lead to advanced credentials and good jobs. The state can use various policies and incentives to encourage districts, postsecondary institutions and employers to develop these career pathways. Here are just two of many potential options:

- Among the state's comprehensive high schools, 110 out of 135¹ are located within 50 miles of a two- or four-year state postsecondary institution. It may be possible to provide students at these schools with access to **early advanced credential programs** or **early college programs** that will enable them to enroll in occupational programs that would otherwise be impossible to deliver at many of the state's smallest high schools. One could envision a program in which students spend one or two weeks on a postsecondary campus engaged in intensive occupational studies and one or two weeks at their home high schools receiving related academic instruction. **More students will graduate from high school if they can see a valuable credential and a good job waiting for them at the end of their high school studies.**
- Another option involves studying the **high-quality web-based CTE courses on SREB's Electronic Campus.** The state could convene panels of secondary and postsecondary educators to review these courses and determine which are (a) suited for high school students, (b) linked to labor market demand and (c) acceptable for credit at the state's two- and four-year postsecondary institutions or in employer-sponsored advanced training and apprenticeship programs. When delivering these web-based courses in smaller schools, a teacher-facilitator may be able to oversee 15 to 20 students taking 15 to 20 different career pathway courses at the same time. **To improve student success in these web-based courses, such teachers must be true "renaissance teachers" with a broad base of experience from which to support diverse learners.**

New Mexico needs to rethink its definition of CTE concentrators, at the high school level. According to 2013 Perkins data we received, the state reported that 52,626 New Mexico students were CTE concentrators, yet the state only had 25,903 on-time graduates in that year. This is further evidence that New Mexico's high schools do not have structured and defined career pathways.

Relatedly, the state must establish in policy a definition of what constitutes a career pathway / program of study. SREB has historically stressed, based on research that a career pathway must consist of four CTE courses in a planned sequence

¹ This number excludes charter high schools and alternative high schools.

that is linked to a broad career field and to postsecondary studies and workplace opportunities.

However, it is also important to emphasize that career pathways at the high school or postsecondary level are not just a collection of technical courses in the career field – these courses must be coupled with the right academics. **Career pathways at both the high school and the postsecondary levels must be designed to allow academic and CTE teachers to plan integrated instruction and assignments.**

Based on our preliminary analyses of CTE course enrollment data, it appears clear that New Mexico has erred on the side of quantity of courses over quality of courses. New Mexico offers more CTE courses than most SREB states. New Mexico’s CTE courses must be defined and driven by industry and postsecondary input and standards. Industry and postsecondary partners must play a leading role in helping the state create frameworks of curricular standards to be taught in its CTE courses. At present, the state has not given its teachers a roadmap of the academic and technical competencies that students must learn.

For example, in the state’s STARS catalog, 27 agriculture courses are offered. The state should work with the Farm Bureau, its agriculture businesses and New Mexico State University to determine what 21st-century agriculture courses in New Mexico’s high schools should look like. The state may also want to study the work Tennessee undertook to redesign its career pathway courses. Overall, this process must involve industry and postsecondary partners, and it must be repeated for all high school CTE curricula.

Goal 2: Create early advanced credential programs

At present, 30 out of every 100 students entering the ninth grade in New Mexico do not graduate on time, and 18 out of every 100 students do not continue on to further studies immediately after graduating. If New Mexico is to meet a “25 by 25” goal of helping at least 25 percent of its young adults earn an advanced credential by age 25, it will have to start while students are still in high school. At present, the last chance for many students to acquire such a credential is during their high school years.

Many New Mexico high schools offer an assortment of introductory courses that do not lead toward a sequence of stackable industry and postsecondary credentials. For example, in 2013, SREB estimates that some 394 credible industry credentials were earned by New Mexico high school students – a conservative estimate, given the limited nature of the data that the state is able to collect on industry-recognized credential completion. **Out of the 25,903 students who graduated from high school on time in 2013, that amounts to just 1.5 percent of those students having acquired a credential at graduation.** In the same review, SREB found that at least 1,670 credible industry credentials or state licenses were earned at the state’s two- and four-year institutions.

Graduating more students from high school with an early advanced credential that will give them a competitive edge in the job market may require the state to create some flexibility in its graduation requirements, where there is evidence that students have acquired the foundational literacy and math skills needed for success in further education and training programs leading to valuable industry credentials.

New Mexico may wish to study the example of Louisiana's recently launched Jump Start initiative for an example of how this can be done. Taking this action will mean incentivizing school districts with funding and bonus points within the state's accountability system for students who remain in school and graduate with a state-approved, credible credential that is linked to state and regional workforce needs.²

Goal 3: Set college and career readiness standards in literacy and math

New Mexico needs to establish academic college readiness and academic and technical career readiness standards for its two- and four-year postsecondary programs. Evidence to support this need is found in the state's ACT test results. Out of the 69 percent of recent high school graduates who took the ACT in 2013, 37 percent met ACT's college readiness benchmark in reading, only 33 percent met ACT's college readiness benchmark in math and only 29 percent met ACT's college readiness benchmark in science. Fifty-nine percent of those tested students expressed interest in pursuing STEM – but many of them did not meet ACT's benchmarks of readiness for STEM programs.

New Mexico's high schools need support to improve CTE students' literacy skills. SREB's survey of 3,686 senior CTE students showed that only 33 percent of respondents indicated that they were required to read grade-level texts across the curriculum and to frequently express, orally or in writing, their understanding of the materials.

Support is also needed in the area of math instruction. Thirty-eight percent of student survey respondents indicated that their math teachers used probing questions to help them complete multi-step math problems. SREB's research has shown that among students who experience a balanced approach to math instruction, a significantly higher percentage meet college- and career-readiness standards.

Overall, only about 40 percent of student survey respondents indicated that their academic assignments were rigorous, required them to read grade-level texts and produce related written products.

The state has much work to do to help teachers understand what 21st-century college- and career-ready assignments must look like. A fundamental truth I have learned over

² Instead of making accountability-related recommendations a separate goal, we have chosen to link accountability to each of the 10 goals described in this preliminary report.

the last 30 years is that students will never reach grade-level standards if they are given below grade-level assignments.

To substantially increase the percentage of seniors meeting college academic readiness and career academic and technical readiness standards will require an intensive three- to five-year effort and investment by the state to equip all teachers, especially in the middle grades and high school, to engage students in reading grade-level text and documents in both their academic and technical classes and to express their understanding of those texts in writing, as well as to prepare math teachers to not only teach procedural mathematics but to also help students reason, understand and apply math.

This will also mean increasing the rigor of CTE classes: CTE students must receive assignments that require them to apply high-school level literacy and math skills.

Related to technical readiness, the state must establish a process of selecting and approving industry certification examinations that reflect appropriate depth and breadth of academic and technical content, prepare individuals for high-skill, high-wage jobs and carry transferrable college credit at state two- and four-year postsecondary institutions. Further, secondary, postsecondary, industry and state workforce partners must work together to select and validate exams that lead to more advanced credentials at the postsecondary level.

Goal 4: Close the gap between career pathway programs of study and workforce opportunities

Using 2012 educational pipeline data, SREB estimates that about 7 percent of 100 students who enter ninth grade will earn an associate's degree three years later; another 6 percent will earn a credible industry credential. **Yet labor market projections from Georgetown University's Center on Education and the Workforce (CEW) show that at least 37 percent of New Mexico's jobs will require an industry credential, well-defined occupational certificate or associate's degree.**

Drawing on the *Recovery: Job Growth and Education Requirements through 2020* report produced by the CEW, which used U.S. Department of Labor data, it is projected that 63 percent of New Mexico's job openings will require some advanced training or postsecondary study by 2020. Twenty-seven percent of those jobs will require less than an associate's degree – including industry credentials and occupational certificates from state two- and four-year institutions. At this time, SREB has not been able to determine the number of individuals who earned occupational certificates from the state's two- and four-year institutions.

It appears that a much greater emphasis needs to be placed on significantly increasing the number of high school graduates who go on to two-year occupational programs at the state's two- and four-year institutions and complete industry credentials, well-defined occupational certificates and associate's degrees linked to labor market demand

and opportunities to earn bachelor's degrees or higher. Pathways to these advanced educational opportunities need to be clearly structured and defined so that students and parents know what occupational and salary outcomes they can expect as they progress through career pathways to greater levels of educational attainment and career advancement.

SREB has estimated that about 21 out of every 100 New Mexico students who enter the ninth grade will enroll in four-year institutions immediately upon high school graduation and earn a bachelor's degree in six years. This is a conservative estimate. Labor market analyses suggest that this number may be closer to 30 percent, and I suspect that with time this number will increase.

Labor market data show that educational requirements in the workplace are increasing in your state and across the country. As I have noted, by 2020, 63 percent of all jobs in New Mexico will require some postsecondary education, and 37 percent will require an industry credential, postsecondary certificate or an associate's degree. **However, only 10 percent of new jobs in the state will require workers with less than a high school diploma – and unless high school completion rates change, evidence suggests that New Mexico will have a surplus of such individuals.**

SREB analyzed labor market projections from three major sources – the state's Jobs Council report, the state's State Workforce Development Board and Georgetown University's Center on Education and the Workforce. Although their numbers are slightly different, all show that the state is poised to experience significant job growth by 2020-2023 in a number of workforce areas that may not be met by existing secondary and postsecondary programs across the state. These areas include:

- **Mining, Quarrying and Oil and Gas Extraction:** With 38 percent projected growth expected in this area, the state will need to develop high school to postsecondary career pathway programs to meet labor market demand.
- **Utilities:** The CEW reports 11 percent projected growth in this area. At present, few high schools appear to offer CTE courses that would prepare students for postsecondary certificate and degree programs in this field.
- **Construction:** The CEW estimates that 9 percent growth is expected in this area. Although a number of high schools around the state offer construction / building trades programs, not enough of them appear to be directly linked to regional two- and four-year postsecondary programs.
- **Manufacturing:** Six percent growth is expected in this area, according to the CEW. At present, SREB estimates that only about 2 percent of the state's current CTE enrollments relate to manufacturing, suggesting a need to expand career pathway programs leading to advanced credentials and degrees in this area.
- **Wholesale Trade** (16 percent growth - CEW) and **Retail Trade** (17 percent growth – CEW): In these areas, more than half of all jobs may be filled by individuals with a high school diploma or less. However, these career fields do feature career ladders to jobs requiring postsecondary certificates, associate's degrees and higher. Overall growth in these areas, along with **Business, Finance and Public Administration**, suggest that the state should consider

building career pathways in these and related areas, including **Marketing, Real Estate and Insurance.**

- **Transportation, Warehousing and Logistics:** Eighteen percent growth is expected in this area, with about 42 percent of jobs projected to require an associate's degree or higher. Although the state may already have adequate programs in transportation and repair to meet its needs, it should consider developing programs specifically focused on warehousing and logistics.
- **Health Care and Social Assistance:** The state is projected to experience 30 percent growth in health care and social assistance jobs. Career pathways that address state workforce needs in these areas are strongly recommended.
- **Hospitality / Food Service:** This area will experience a projected growth of 25 percent, with 40 percent of jobs requiring some education beyond high school. Although many jobs in this area are low-wage and low-skill, Hospitality / Food Service can offer solid educational and career advancement opportunities.
- **STEM (Science, Technology, Engineering and Mathematics):** SREB's analyses suggest that the state will experience strong growth in STEM jobs — those that require advanced math, science, technology and problem-solving skills. Some of these jobs will require a bachelor's degree. Others will require an associate's degree or an advanced industry credential. This suggests the need to reward districts that help more students complete an advanced STEM-centric career pathway featuring at least two courses in Advanced Placement math and science, computer science, informatics, biomedical science, pre-engineering, power and energy, renewable energy, advanced manufacturing, aeronautics and aviation, innovation in science and technology and others.
- **Public Safety, Corrections and Security:** New Mexico can expect to see job growth in this area and should seek to develop more career pathway programs in this area. Analyses of student CTE course and dual credit course enrollment data suggest that many New Mexico students are interested in this career area.
- **Arts, Audio/Visual, and Communications:** Preliminary analyses suggest that the state may have a surplus of student enrollments in this area.

SREB is in the process of reconciling these three sets of labor market projections with current student enrollment and completion data and will make more defined recommendations in our final report.

For New Mexico, it will be important to create incentives and policies to drive structured or guided pathways beginning in high school that result in more students moving on to postsecondary programs leading to advanced industry credentials, occupational certificates, associate's and bachelor's degrees.

At this time, however, SREB recommends that the New Mexico Public Education Department work closely with the New Mexico Higher Education Department and the state's Department of Workforce Solutions, along with appropriate business and industry partners, to redesign the state's CTE courses, reduce and streamline the number of CTE courses offered and prepare new curriculum frameworks based on projected regional and state workforce demands. The goal of this work should be to create rigorous

career pathways that truly address the complex academic, technical, cognitive, technological and workplace readiness skills that New Mexico students will need in its 21st-century workplace. Postsecondary and business and industry partners must play a central role in this work.

Further, SREB recommends that the state establish procedures through which regional councils can work with school districts and colleges to develop, adopt or redesign pathways leading to advanced industry and postsecondary credentials and high-paying, high-demand jobs. New Mexico will need to make substantial investments in incentivizing the state's two- and four-year postsecondary institutions and school districts to develop collaborative, innovative career pathway programs that meet regional workforce needs in high-demand industries.

Goal 5: Increase to 25 percent the number of young adults earning a credential by age 25

About 11 percent of young adults in New Mexico between the ages of 20 and 24 are unemployed and looking for work. Unless they enroll in some type of training program leading to a credential after high school, these youth are in danger of becoming part of a permanent underclass. Currently, 30 percent of New Mexico's high school students do not graduate on time, and of those who do, only about 7 percent are acquiring an associate's degree within three years.

The state needs to make a concerted effort to greatly expand the number of students who acquire an associate's degree or other industry or postsecondary credential. **New Mexico needs to set a "25 by 25" goal that 25 percent of all students who enter the ninth grade will earn a credible industry credential, postsecondary occupational certificate or associate's degree by age 25.**

In creating a system of stackable credentials, it is vitally important that the state ensure that all credentials earned at the high school and postsecondary levels translate into certain amount of college credit that is guaranteed to transfer to the next level of credential or degree attainment.

Creating this system will require the state to establish policies that advance dual credit courses that enhance students' academic and technical readiness. The state will need to offer incentives to encourage two- and four-year institutions and school districts to partner to offer these dual credit courses. The state will also need to allocate extra weight within its accountability system for each student who meets both college and career readiness standards and earns an advanced industry credential. Further, postsecondary institutions will need to increase students' ability to successfully earn these credentials by re-examining the avenues through which students can qualify for credit-bearing postsecondary coursework.

Goal 6: Increase access to high-quality work-based learning experiences

SREB's surveys of parents of New Mexico CTE students showed that 72 percent of parents wished their children had opportunities to pursue on-the-job training and 70 percent wished their children had opportunities to pursue advanced training leading to an associate's degree. These results reflect opinions expressed in a national poll of parents conducted by Phi Delta Kappan and Gallup published in October 2014. **In that national poll, 66 percent of parents agreed that high schools should require all students to participate in paid or unpaid internships in a related career field.**

In its survey of 3,686 New Mexico high school seniors taking CTE courses, SREB found that just 32 percent of those students reported participating in quality work-based learning experiences. The state will need to incentivize industry partners to offer structured, progressively intensive work-based learning that engages students in authentic applications of academic, technical and workplace skills – such incentives may include structured tax credits. The state will also need to take steps to protect employers and students engaged in work-based learning.

Goal 7: Restructure low-performing high schools with low graduation rates

With this goal, SREB offers New Mexico two sets of recommendations for restructuring low-performing high schools with graduation rates under 70 percent – one set of recommendations for schools serving more than 500 students, and one set for schools serving less than 500 students. Both are based on a comprehensive framework of strategies for restructuring high schools around rigorous career pathways. However, in schools with student enrollments of less than 500, SREB recommends making greater use of approved web-based courses that can serve as the first or second course in a career pathway linked to two and four year postsecondary institutions.

New Mexico has 60 high schools that serve less than 250 students. Many of these schools graduates less than 70 percent of their students. Creative approaches are needed to give these students access to high-quality career pathway programs of study. New Mexico can take a number of actions – through incentives and accountability indicators – to provide quality career pathways to students in its smallest schools. Options include:

- Restructuring small schools around high-quality four course pathways in which the first and second foundational courses are offered in a web-based format (e.g. NM-IDEAL, SREB's Electronic campus) and the third and fourth courses are offered at a regional two- or four-year postsecondary institution.
- Redesigning existing CTE courses in career pathways or adopting existing career pathway programs like SREB's Advanced Career curricula in hybrid formats that span web-based and classroom instruction at the high school with dual credit coursework at a regional postsecondary institution.
- Create 13th-year programs in partnership with regional two- or four-year postsecondary institutions or allow students to engage in full-time intensive study at the postsecondary institution during their senior year of high school (e.g., through early advanced credential programs or early college programs).

Because New Mexico has so many small schools, as you begin redesigning your agriculture courses, for example, you may want to consider offering four-course pathways that include courses in agricultural mechanics, construction, welding and electricity. Such a set of courses, if organized around authentic projects, would provide an excellent foundation for employment and further study in a range of postsecondary programs. Many of your agriculture teachers have the diverse backgrounds needed to teach such programs successfully. Other four-course career pathway sequences might address agricultural science, horticulture, animal science or landscaping.

To reward low-performing schools that make progress in increasing graduation rates and enhancing students' college and career readiness, we recommend that the state allot bonus points within its accountability system and award financial bonuses to schools for each student who meets college and career readiness benchmarks and earns an advanced industry credential. **Such rewards should apply to all high schools – not just low-performing high schools.**

Goal 8: Create a guidance system of career information, exploration and advisement

In an October 2014 PDK/Gallup poll, 89 percent of American parents expressed the wish that public high schools would make a more concerted effort to provide their children with information about career opportunities. **It would appear that no more than one-fifth of the 3,686 New Mexico seniors who responded to SREB's survey reported having such experiences in high school.**

SREB advises New Mexico to establish a policy through which school counselors will lead and support career and educational guidance systems that are curriculum-based and involve developing teachers as advisers. In small schools that do not have a counselor, designate a teacher to lead this effort. This will require some release time for teaching duties. The state may wish to make initial grants to two high schools in each region of the state to develop such a guidance system in their schools and provide them with follow-up technical assistance and support to implement their plans.

Creating structured career pathways will require a major reconfiguration of the state's approach to guidance, teacher advisement and the delivery of career and college information that helps students and parents make informed decisions about:

- the sequence of academic and technical courses they need to take in high school.
- what is required to complete an advanced industry credential, what percentage of students currently complete such credentials and what kinds of jobs and salary outcomes they can expect to achieve if they acquire them.
- what percentage of students complete associate's degrees, the jobs and salaries associated with those degrees and what percentage of associate's degree earners transfer to bachelor's degree programs.

Students and parents need information on how to get on and off educational pathways leading to postsecondary attainment and career advancement, starting with advanced credentials that students can earn after completing rigorous four-course career

pathways in high school. Career and college planning information must show students and parents how the advanced credentials they earn in high school are part of a system of stackable credentials that also includes more advanced credentials, certificates and associate's and bachelor's degrees.

Goal 9: Reform STARS and other state data and reporting systems

To date, SREB's needs assessment of New Mexico's CTE programs has revealed that much work needs to be done to create a better data system that will allow you to make informed decisions based on what is working and not working in your schools. Florida is one Southern state with a premier state longitudinal data system. It will be well worth your efforts to study this data system and learn how it uses its Economic Security Report to drive career pathways that meet existing and emerging labor market demands. North Carolina has also made significant improvements in its data systems in recent years.

Having a strong data system is essential to meeting your state's educational and labor market demands.

SREB has found that New Mexico does not currently have a data reporting system that distinguishes between students who are exploring diverse CTE courses and students who are completing guided, structured career pathway programs of study.

The state needs to establish a uniform titling, numbering and course description system that will be used by all schools. **It also needs to clearly lay out career pathways that align secondary and postsecondary studies, providing some flexibility for creative, innovative career pathway development as regional needs require.** In the case of CTE dual credit courses, the state needs to establish a uniform statewide dual credit numbering and titling system that takes into account the career pathways to which these courses apply, and to establish dual credit transfer policies that ensure students can seamlessly progress from one certificate or degree program to another – across state institutions – without losing credits or repeating coursework.

Goal 10: Attract, prepare and retain high-quality CTE teachers

Almost half of the New Mexico CTE teachers surveyed by SREB reported that they need staff development support for designing assignments around authentic projects that require students to apply a mix of academic, technical, cognitive, technological and workplace readiness skills. Less than 15 percent of the teachers surveyed reported having at least 40 hours of development on these topics in the last three years.

The state needs to develop a fast-track induction program that prepares new teachers to plan, teach and assess authentic, project-based assignments. It also needs to provide intensive professional development to all CTE teachers on incorporating literacy and math into their assignments. **This action is essential if CTE teachers are to have a maximum impact on advancing students' academic readiness for college and careers.**