New World of Work: Preparing College Students to be Competitive in Rapidly Changing Industries

Over the past two decades, the world's industries have been disrupted by a digital transformation, impacting communities throughout the world. A *2013 United Nation's Report* commented that more people in the world have access to a cellular phone than to basic sanitation, highlighting the leap in gains from technology. In fact, the ubiquity of mobile phones and their application to people's daily functions has spawned a new level of economic transformation based on the complement of technology to human performance.

Thought leaders, when discussing the future of work, often mention that today's elementary students will be employed in jobs that industry today cannot even begin to describe. These students will be faced with rapid and continual economic transformation, impacting the workforce and requiring workers to be highly adaptable to learning new skills quickly. One of the most valuable assets of any economy or company is its human capital–the skills, capabilities and innovation of its citizens. Identifying existing skills that are in decline or no longer required by industry has been the focus of much academic and private sector research. Deloitte, in its *Deloitte Insights: 2018 Study on Skills Gaps and Future of Work*, reported a widening skills gap, noting that more than 50 percent of manufacturing jobs would go unfilled because shifting skills requirements from advancements in technology.

These changes will impact the future of jobs, exposing the gap between skilled and non-skilled employees. The result of this rapidly changing workforce landscape will be higher productivity and job displacement for ill-prepared workers. The challenges facing labor markets today are significant and aptly suited to higher education institutions for finding solutions. Colleges and universities can be at the center of solving the misalignment of required workforce skills with the skills learned in formal educational settings.

Higher education institutions will be called on to define and create effective systems for imparting skills and capabilities in line with emerging skills demand. The approaches to developing solutions will be vastly different on research university campuses, or regional comprehensive universities compared with two-year community colleges who are focused on vocational careers or as an entry point for students to transfer into the four-year sector. To realize the value of such investments, colleges and universities will need to accompany such efforts with investments with private sector institutions.

New Mexico State University and its system of branch campuses throughout the state have begun to reexamine the role of higher education in meeting the needs of the local, regional and national workforce, and in particular, helping students develop skills that are competitive. NMSU, having undergone a financial transformation resulting from declining revenue and student enrollment, has begun to position strategically to capture a greater level of student enrollment. Equally important, the university has been matching its capital investments, with generous support from the Legislature, to build educational platforms for students that are industry relevant.

AGENCY: New Mexico State University, Dan Arvizu, Chancellor; Enrico Pontelli, Dean, College of Arts & Sciences; Monica Torres, DACC President
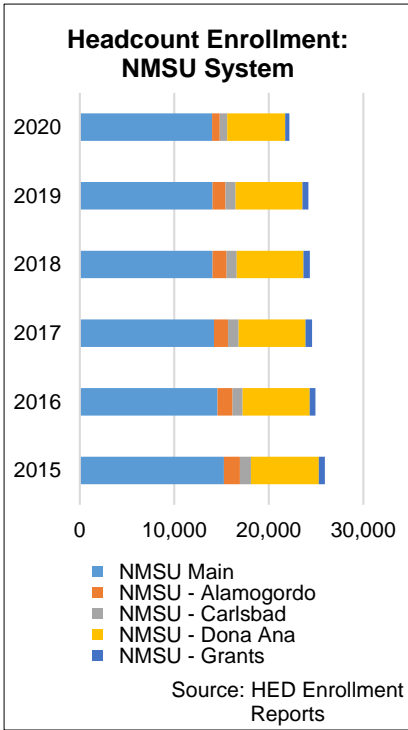
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PURPOSE OF HEARING: Hear from NMSU System Chancellor on strategic direction to increase enrollment and graduates.

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Example: Top five skills required by employers in manufacturing

1. Computer/technology awareness and mastery.
2. Digital competency and operation of highly automated equipment.
3. Programming languages/skills for robotic systems and assembly automation.
4. Maintenance or repair of highly complex systems or physical equipment.
5. Critical thinking and analysis.

Source: Deloitte Insights, 2018

Headcount Enrollment: NMSU System

- NMSU Main
- NMSU - Alamogordo
- NMSU - Carlsbad
- NMSU - Dona Ana
- NMSU - Grants

Source: HED Enrollment Reports

Retention Rate: NMSU Main Campus

- 1 year
- 2 year
- 3 year
- 4 year

Performance in Recruitment, Retention and Completion

Enrollment. College enrollment has declined precipitously for several years in New Mexico, as previously identified in the 2017 LFC program evaluation *Higher Education Cost Drivers and Cost-Savings*. College enrollment is a leading indicator for statewide goals of educational attainment and workforce sufficiency.

The NMSU system has experienced declines in student enrollment across the board, however the impacts have been less severe at the NMSU main campus than what the branch campuses have experienced. Over the past five years, NMSU Main campus declined by 4 percent, outperforming its peers in New Mexico. The branch campuses on the other hand declined in total enrollment more than peers. For instance, NMSU Alamogordo's total enrollment has decreased from 1,400 students to fewer than 800 students, or 48 percent decline. NMSU Carlsbad and Grants have both declined by 26 percent.

Student Retention at NMSU. Generally, at four-year universities, an average 35 percent of first-time university students leave after the first year. Universities do not maintain data to describe the reasons students leave; some students transfer to a different institution, some students leave for financial reasons, and some leave for academic reasons. Of the 65 percent of students who persist through their first year, 42 percent, on average, graduate within 6 years.
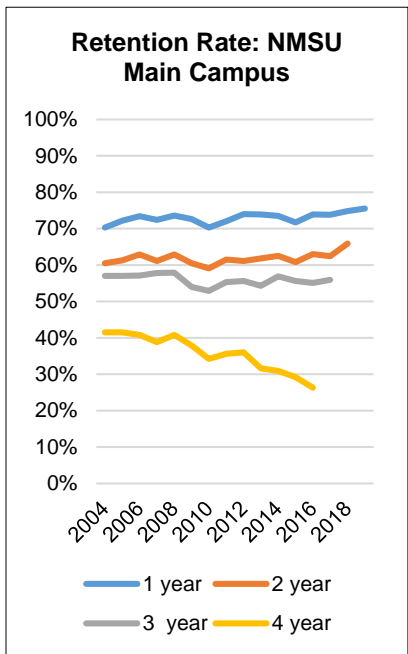
New Mexico universities lag regional peers at retaining students, which impacts college enrollments and tuition revenue. The cost to the student is tremendous; the student population with the highest default rates on student loans has balances under $5,000. The cost to the state is equally detrimental, impacting the state's ability to reach a more educated population and to meet workforce demands.

At NMSU for the past two years, student retention has been steadily improving. NMSU's Aggie Pathway, a model designed to help students better prepare for the rigors of a research university by starting at a NMSU branch campus, may be an effective tactic to support students. NMSU, unlike its peers, publishes data on each of its starting freshman cohorts, tracking annual student retention through graduation. The data is useful as a leading indicator to graduation rates and student completion. Importantly, 2-year and 3-year retention are increasing at NMSU main campus, which indicates the research university is driving students to higher levels of completion.

First-year retention rates at the NMSU branch campuses are improving. Similar to enrollment, keeping students on campus earning degrees improves the financial position of colleges. In New Mexico, third-semester student retention data appear to show students return after the first year at levels consistent with surrounding states, but drastically drop out after that point.

Retention rates for first-time, full-time degree-seeking students to the second semester	Fall 2016 to Fall 2017 Actual	Fall 2017 to Fall 2018 Actual	Fall 2018 to Fall 2019 Actual	Fall 2019 to Fall 2020 Actual
NMSU - Alamogordo	48%	52%	54.6%	52%
NMSU - Carlsbad	48.6%	49.7%	50%	64%
NMSU - Dona Ana CC	59.2%	59.1%	62.7%	65%
NMSU - Grants	43.5%	52.5%	53.7%	60%

Graduation Rates at NMSU. Statewide, colleges and universities – with the exception of branch campuses, which underperformed targets – are exceeding their own institutional performance targets for students graduating within three years (for associate's degrees and certificates) or six years (for bachelor's degrees). New Mexico still falls far behind the average graduation rates of peer institutions in surrounding states. However, the targets remain very low and if unchanged, will not help the state meet its workforces needs.

Important successes are happening throughout the system; NMSU increased its graduation rate from 45 percent to 52 percent, significant given the enrollment challenges. Like the University of New Mexico, the four-year graduation rate at NMSU has almost doubled in the past five years. The momentum is needed, particularly because the research universities trail their peers in other states.

New Mexico's 24 state-funded colleges and universities will need to adapt in two key ways. First, the state's colleges and universities will need to become more streamlined and collaborative in the use of finite resources for instruction, administration, and capital outlay. Second, the state's colleges and universities will need to aggressively improve their recruitment and retention of resident and out-of-state students.

Top Ten Academic Programs

On average, the New Mexico State University system (main campus and branches) produces 22 percent of total awards funded in the higher education funding formula. The NMSU system comprises 22 percent of total enrollment at public colleges and universities in the state. The NMSU system produces a high percentage of its awards, more than 65 percent, in the Tier 1 classification for the higher education funding formula, which is in line with the UNM systems' outcomes.

The tables below provide a historical view on the types of degrees awarded over the past ten years. Comparing FY11 to FY20, two degree types have declined substantially: certificates by 44.6 percent and master's degrees by 32.7 percent. That certificates have declined within the NMSU system when compared with statewide growth, 42 percent in past five years, shows NMSU branch campuses, through the Aggie Pathway program, appear to be transferring students to four-year institutions. The outsized growth in certificate programs in New Mexico appears to be occurring at independent community colleges.

The data validate the value of the Aggie Pathway program in helping students begin at a two-year branch campus, and after earning an associate degree, transferring to the main campus. At each of the branch campuses, the highest number of associate degrees awarded are aligned with the top producing bachelor degree programs at the main campus: criminal justice, healthcare fields, business administration, and general education core liberal arts degrees.

Bachelor's degrees, during the same time period, have declined by 5.5 percent, but fluctuated up and down during the past decade. On average, New Mexico State University graduates more than 2,400 bachelor's degree candidates every year. The top ten academic bachelor's degree programs produce 40 percent of the graduates, or 1,025, and the bottom 35 programs only produce 6 percent, or 164 graduates. At its main campus, NMSU has 35 academic programs, or 37 percent, that graduate 10 or fewer graduates every year, reflecting 164 graduates.

Graduation Rate: NMSU Main Campus

Number of Academic Programs by Number of Graduates
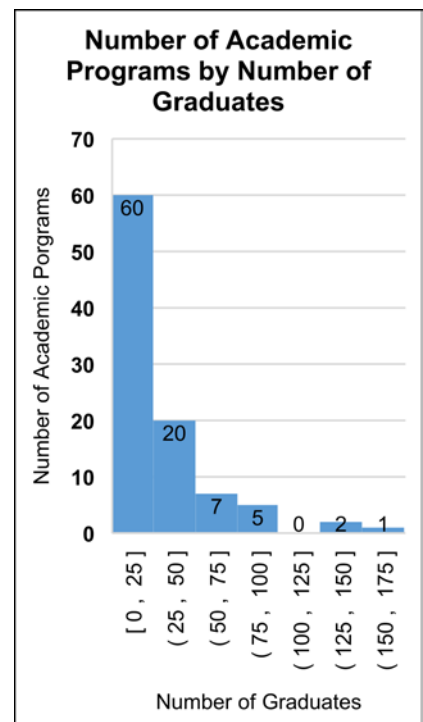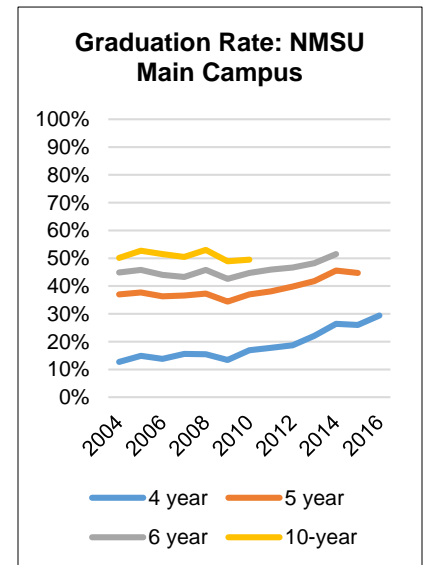
Despite substantial state investments in teacher preparation scholarships, the number of teacher candidates has declined over the past five years. Including graduates of kinesiology, the College of Education at NMSU has graduated just more than 800 teachers in total in five years. However, important trends have materialized where elementary education decreased from 64 graduates in 2015 to 28 in 2020. Secondary education and special education teacher graduates have also declined.

NMSU Awards by Funding-Formula Tier: FY11 to FY20						
Award Level	Main Campus	Alamogordo Branch	Carlsbad Branch	Dona Ana Branch	Grants Branch	Total Awards
Tier 1	22,106	1,310	845	8,222	636	74,893
Tier 2	6,015	145	127	1,537	98	19,372
Tier 3	5,164	285	239	2,439	200	18,207
	33,285	**1,740**	**1,211**	**12,198**	**934**	**112,472**

New Mexico State University System (Main Campus and Branches)										
	Total Awards by Type									
Award Category	**FY11**	**FY12**	**FY13**	**FY14**	**FY15**	**FY16**	**FY17**	**FY18**	**FY19**	**FY20**
Certificates, Less than a Year	9	5	7	21	24	27	24	20	37	119
Certificates, One-to-Two Years	529	371	300	257	249	307	238	273	233	293
Certificates, Two-to-Four Years	-	-	-	-	-	-	-	-	-	-
Associate Degree	1,237	1,341	1,399	1,354	1,303	1,436	1,240	1,252	1,141	1,187
	1,775	**1,717**	**1,706**	**1,632**	**1,576**	**1,770**	**1,502**	**1,545**	**1,411**	**1,599**
Bachelor's Degree	2,365	2,335	2,429	2,552	2,436	2,548	2,406	2,320	2,313	2,236
Master's Degree	972	868	791	800	786	737	708	689	683	654
Doctorate	106	102	132	114	131	120	111	138	134	126
Graduate Certificates	26	22	20	28	31	25	33	36	41	38
	3,469	**3,327**	**3,372**	**3,494**	**3,384**	**3,430**	**3,258**	**3,183**	**3,171**	**3,054**
Total Awards	**5,244**	**5,044**	**5,078**	**5,126**	**4,960**	**5,200**	**4,760**	**4,728**	**4,582**	**4,653**

Source: HED Funding Formula Raw Data

NMSU: Top Ten Bachelor's Degree Candidates by Academic Program							
	Academic Program	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
1	Criminal justice	178	222	170	150	156	152
2	Individualized studies	142	139	156	141	153	127
3	Nursing	129	118	179	154	106	139
4	Mechanical Engineering	67	74	126	109	109	109
5	Psychology	107	108	92	87	92	89
6	Business: Marketing	88	93	87	96	92	79
7	General Business	80	66	73	79	94	91
8	Biology	75	77	79	75	73	81
9	Business: Management	67	84	93	69	49	55
10	Foreign languages	61	74	71	64	52	54
	Total Graduates (Bachelor's)	**994**	**1,055**	**1,126**	**1,024**	**976**	**976**
	Annual Increase		61	71	(102)	(48)	0
	Annual Percentage Increase		6.1%	6.7%	-9.1%	-4.7%	0.0%

Source: NMSU Office of Institutional Analytics

NMSU College of Education: Graduates by Discipline						
	2015	**2016**	**2017**	**2018**	**2019**	**2020**
Music education	12	9	6	12	11	17
Early childhood education	17	28	26	13	23	16
Elementary education	64	58	41	45	30	28
Kinesiology	57	70	52	63	68	57
Secondary Education	26	25	21	15	13	14
Special education	12	16	12	7	2	4
Total Graduates (bachelor's degree)	**188**	**206**	**158**	**155**	**147**	**136**
Annual increase		18	(48)	(3)	(8)	(11)
Annual percentage increase		9.6%	-23.3%	-1.9%	-5.2%	-7.5%