

NOV 17 2011

THE WATSON-HADWIGER FORMULA
NEW MEXICO HIGHER EDUCATION DEPARTMENT, OCTOBER 2011

Increasing productivity in higher education will depend...on building strong accountability systems that move away from the ones primarily in use today, which tend to emphasize inputs over outcomes and the collection and reporting of data....Revamping states' higher education accountability systems should focus on increasing the use of performance and outcome metrics and then using those metrics to make and evaluate policy decisions..." (Reindl and Rayna, National Governors Association, 2011)

The effort by the Higher Education Department this year to make fundamental changes to New Mexico's higher education funding formula has been both a monumental challenge and an historic opportunity. For years taxpayers in New Mexico have funded a system based on inputs, or costs, and on providing strong access to institutions for students. The result has been a college and university system that is relatively expensive in cost-per-degree compared to other states, a proliferation of new campuses and learning centers without a corresponding increase in the number of degrees and certificates, and a lack of synchronization between the kinds of skills students emerge with and the workforce needs of New Mexico. While each individual institution of higher learning is producing in some cases world-class students and research, collectively, the system as a whole is not operating at optimal levels. The challenge is to shift incentives away from the costs of educational inputs toward stronger performance outputs, while still maintaining strong student access to education. The opportunity is to create a system of higher education that will provide efficient incentives for colleges and universities to help create a globally competitive workforce for the future.

BACKGROUND

The Governor: In her interview with Dr. José Z. Garcia for Higher Education Secretary, Governor-elect Susana Martinez charged him with creating a funding formula that would emphasize outcomes; moreover, the new formula would reward institutions for closing gaps between the workforce now available and the workforce New Mexico will need in the future to remain globally competitive.

The Boulder Concordat: After the 2011 legislative session ended, the Higher Education Department (HED) convened a one-day workshop in Boulder, Colorado, facilitated by the Western Interstate Commission on Higher Education (WICHE), with participants from a broad sector of New Mexico's major stakeholders in higher education: private sector employers, the Sandia and Los Alamos labs, legislators, the DFA Secretary, a representative from the LFC, representatives from the Workforce Solutions and Economic Development Departments, representatives of the various higher education associations, college presidents, and the chair of the Council of University Presidents. The gathering ended with a broad consensus of cooperation toward moving swiftly towards a workforce-driven, output-measured formula. This consensus has come to be known as "The Boulder Concordat."

The Funding Task Force (FTF): Active for many years prior to 2011, the FTF was reconvened; Curtis Porter, from the University of New Mexico, continued to chair the Task Force. With participation open to each institution, as well as the LFC and DFA, agreements were reached on how to make the process inclusive, transparent, and fair. Institutions would be held to a stop-loss of 1%-2% of the FY2013 distribution for the first year, and sector equity among research, comprehensive, and two-year institutions would be maintained. The FTF would make recommendations to the HED by September 15. Further input would be solicited, but in accord with statutes the ultimate responsibility for writing the

formula would reside with the HED. Subcommittees working on the formula included the "strawman" committee, held weekly meetings to develop a structure for the new formula; the "institutional research group," responsible for identifying and defining output data; the "finance committee," which assigned dollar values to data; and a "research committee" to study practices in other states.

Workforce Projection and Achievement Gap: While the FTF was building the formula, HED was sponsoring a number of other activities designed to project a desired New Mexico workforce for the future, to be updated annually, at both statewide and regional levels. HED has consulted with the top expert in the U.S. in workforce projections, Anthony Carnavale, from Georgetown University, who participated in the Boulder meeting. Two workshops were held to discuss workforce projections, eliciting strong support from the private sector, the national labs, the Workforce Solutions, Taxation and Revenue, and Economic Development departments. In addition, since an agreement was reached early on to provide incentives to institutions for reducing the achievement gap, a workshop has been held to study ways to do this, and discussions are under way to explore the possibility of regionalizing existing workforce-college/university partnerships. HED is continuing to develop a mechanism to produce and update a desired workforce that will enhance New Mexico's global competitiveness in the future.

Future Refinements: As data collection for output measures is improved and as feedback is gathered, new metrics will be used and the formula will be refined.

THE FUNDING FORMULAS

Some Characteristics of the Old and New Formulas:

Simplicity: The old funding formula required 125 worksheets to calculate. In the new formulation we expect the formula to require less than a dozen worksheets.

Metrics: The old formula rewarded institutions for **inputs:** square feet of building space, enrollment, eligible square feet for building replacement and renewal, equipment valuation, tuition rates, in-state and out-of-state students, 17 different tuition waiver types, utility costs, land grant permanent fund revenue projections, and other measurements of cost. The new formula provides **four** output incentives: for students to **complete their courses**; for institutions to **increase the number of graduates**; for institutions to **increase science, technology, engineering, health, and mathematics degrees and certificates**; and to **graduate more at-risk students**.

Mission Differentiation: The old formula consisted of one single set of complex metrics of cost inputs, across the three sectors. As a result, research institutions have been spending valuable assets to educate underperforming students instead of concentrating on research, while four-year colleges struggle to compete with research institutions or with two-year colleges; and two-year colleges sometimes try to compete with four-year institutions. The new formula (in fact, there are three new formulas) distinguishes missions between sectors, providing different metrics for each. The separation of metrics for each sector signals to institutions that they should sharpen their educational mission goals to maximize formula incentives.

FORMULA CONCEPTS

- a. **Workload and Outcomes:** This model reflects changes in workload and outcomes. As changes occur in course completions, the number of students graduating, increases in the achievement of at-risk students, etc., these will be reflected in the distribution of funds to the institution.

- b. **Outputs as a percentage of the total distribution in 2013:** To jump-start the new formulas, the 2012 distribution for each institution was used as a "base." Five percent of the total distribution will be calculated by output measures. The percentage of the total distribution calculated by output measures will increase in subsequent years. National experts on funding formula experiences in many states suggested that these proportions were optimal for the first year: strong enough to warrant Institutional attention, suggesting immediate planning changes, but not strong enough to hurt institutions unduly in the short run.
- c. **Stop-loss:** Since institutions could not have planned for the FY2013 distribution it was agreed for the sake of fairness that HED would hold each Institution to a stop-loss provision of plus-or-minus 2%. This will not be true of the FY2014 distribution.
- d. **Sectoral Equity:** For the first year's distribution, the proportion of the total distribution going to the different sectors will remain intact; that is, the overall proportionate allocations to research, comprehensive, and two-year colleges, will remain the same.
- e. **Process:** Leadership at HED insisted from the beginning that the process of creating a new formula would be inclusive, transparent, and fair. Leaders of the three sectors on September 8 agreed this indeed had been the case, and at a meeting on September 26 between HED leadership and institutional leaders, Dr. Steven McCleery and others attested to the adherence to these principles throughout the process of creating the new formula.
- f. **Budgetary Considerations:** Given the fiscal constraints on the state budget, HED will present a flat budget to the executive branch for the FY2013 funding distribution

EXAMPLES OF MAJOR CHANGES IN THE FORMULA

1. In the previous formula a student census on the twenty-first day determined the calculation of student credit hours. In the new formula only students who have finished the course at the end of the semester will be counted. This measure shifts resources to more productive purposes.
2. In the old formula incentives were provided for adding square feet of building space for each campus. This resulted in recent years in a huge proliferation of buildings. The new formula will not reward institutions through the formula for adding new square feet. The emphasis is on graduating students, closing the achievement gap, and increasing the production of STEHM (science, technology, engineering, health, and math) degrees and certificates.
3. The old formula did not reward movement of institutions toward a globally competitive workforce. In New Mexico the workforce cannot become fully competitive until the state finds a way to close the achievement gap, since well over 60% of the future workforce is now in the at-risk category. This formula specifically rewards institutions for closing the achievement gap.

SUMMARY

With the active assistance and consultation of public and private stakeholders as well as national experts, HED has written a new formula for funding higher education. It provides incentives for closing the gap between the workforce New Mexico will need and what the higher education institutions are producing today. HED will continue working on it and will convene the institutions to discuss its implications for a number of important policy issues.

EDUCATING TOMORROW'S WORKFORCE:

NEW MEXICO'S HIGHER EDUCATION FUNDING FORMULA FOR FISCAL YEAR 2013

RECEIVED
VIA E-MAIL

NOV 17 2011

New Mexico Higher Education Department
Dr. Jose Z. Garcia, Cabinet Secretary
October 14, 2011

Section 4J of Chapter 179, Laws of 2011 requires the Higher Education Department (HED) to “recommend revisions to the funding formula authorized by Section 21-2-5.1 NMSA 1978 no later than October 15, 2011.” To comply with this requirement, HED has developed this formula for calculating workload and funding needs for public higher education institutions in New.

This formula is considered a Model T. The new formula does not address a full range of higher education objectives, but, like the Model T, focuses on the basics – providing incentives for higher education institutions to achieve core objectives such as increasing the number of graduates, addressing workforce needs and increasing graduation of at-risk students. The Higher Education Department will build upon this core in the future.

Though the Model T is considered primitive by modern standards, it was a transformational vehicle in its time – forever changing the fundamentals of transportation. Similarly, the new funding formula represents a fundamental shift of focus in higher education funding. In the past, New Mexico calculated higher education workload based upon inputs – how much it cost to replace buildings and equipment, to pay for student services and utilities, to provide education and educational support to students who were present at the beginning of a course.

The new funding formula shifts focus from funding higher education line items to funding statewide priorities, such as addressing statewide workforce needs. It shifts from funding inputs to funding performance. The Higher Education Department will use this formula to develop a higher education budget recommendation for fiscal year 2013 and beyond and will provide this recommendation to the executive and legislative branches as required by statute.

FY13 FUNDING FORMULA

The fiscal year 2013 funding formula begins with the fiscal year 2012 instruction and general appropriation as a base. The FY12 base is adjusted to reflect increases in utilities costs in recent years.

Reflecting mission differentiation of the three sectors, the State of New Mexico will use three separate funding formulas for research universities, regional or comprehensive universities and two-year colleges.

RESEARCH UNIVERSITIES

Research universities are responsible for addressing statewide workforce needs for highly educated individuals, including producing doctorates, most professional advanced degrees, master’s degrees, and bachelor’s degrees. These institutions also conduct research and develop and transfer new technologies for private sector exploitation. Factors in the funding formula for research institutions will include:

Completed student credit hours. In the past, the funding formula was based heavily on the number of student credit hours enrollment on the 20th day of the semester. This created an incentive to recruit students into courses but not necessarily to complete them. The new formula includes a factor for completed student credit hours. Completed student credit hours include credit hours for all undergraduate and graduate courses for which a student received a letter grade, pass-fail grade or similar binary outcome, incomplete, or audit complete (excluding audited recreational physical education courses). Incompletes are included in this factor with the requirement that they must resolve to a grade. Audited courses will only be included for students who attend 80% of class meetings

through the semester. In New Mexico, research universities do not offer developmental, remedial or vocational/technical courses.

Dollars are assigned to completed student credit hours by calculating change over time for each institution using a three-year rolling average to smooth out bumps and dips that may occur in a single year that could create excessive funding instability for an institution.

In running the formula for FY13, HED will compare a two year rolling average (AY08-09 and AY09-10) with a three-year rolling average (AY08-09, AY09-10 and AY10-11). This reflects a decision that was made a year ago for the FY12 formula, which was based on a two-year rolling average (academic years beginning summer 2008 and 2009) with a plan to go to a three-year rolling average for FY13. Beginning in FY14, only three-year rolling averages will be used. Unfortunately, HED only began to collect student grade data in fall 2010, so completion numbers had to be estimated for prior school years. In the future, estimates will be replaced by actual data.

The dollar value of each course reflects the cost of delivering the course content and student support, set up in a three-by-three grid. For example, courses that require laboratory equipment are more expensive than standard classroom courses. Upper division and graduate courses tend to be more costly due to smaller class sizes and use of tenured or tenure-track instructors with doctoral degrees.

Formula Cost Factors			
Tier	Lower	Upper	Graduate
1	\$153.67	\$313.77	\$655.42
2	\$219.53	\$479.73	\$894.14
3	\$341.49	\$548.17	\$1,417.10

Each institution's annual completed student credit hours are sorted into a grid that follows the format of the cost factors above. An example might look like this:

Summary of SCH			
Tier	Level		
	Lower Division	Upper Division	Graduate
1	4,219	1,448	1,473
2	336	261	118
3	104	7	1
TOTAL	4,659	1,716	1,592
	TOTAL SCH		7,967

The grids for the three years will be averaged by cell. The averages will be multiplied by the amounts in the Formula Cost Factors grid for each rolling average. The difference between the total amounts of funding generated for the two rolling averages is presented as the change in workload. Completed student credit hours will be calculated at 45 percent of the change in these amounts.

Number of degree and postgraduate certificate awards. Experts on New Mexico workforce needs indicate that the state needs to produce more degrees and certificates in general. For research universities, the new formula includes a funding factor based upon the total number of undergraduate and graduate degrees and postgraduate certificates awarded by each institution.

To calculate this factor, all undergraduate and graduate degrees and postgraduate certificates produced by an institution in the most recent year for which data is available (2009-2010) are sorted into tiers, following the structure of the student credit hour tiers. An example is shown below.

Tier	2009-2010					
	Bach Degree	Master Degree	Doctorate	First Professional	Post Bachelor's Certificate	Post Master's Certificate
1	47				2	
2	21	24	3	18		
3	128	76	5			

The Funding Task Force’s Finance Group estimated the cost of generating a degree or certificate based upon national cost standards for different levels of instruction, modified to reflect the tier structure from New Mexico. The resulting cost grid relevant to research universities appears below:

Tier	Bach Degree	Master Degree	Doctorate	1st Prof	Post Bach Cert	Post MA Cert
1	\$33,000	\$24,434	\$80,727	\$80,727	\$5,809	\$14,306
2	\$47,623	\$35,261	\$116,499	\$116,499	\$8,383	\$20,645
3	\$69,792	\$51,675	\$170,732	\$170,732	\$12,286	\$30,255

The two grids are multiplied to estimate the cost of generating the degrees produced that year. The funding factor for FY13 represents two percent of the total cost.

Workforce Needs. Nationally, technological innovation is driving change in the American economy. One study of future workforce needs explained:

“What is driving this transformation of the American economy? In a word: technology. In the 19th and 20th centuries, electricity and the internal combustion engine drove the rise of manufacturing and America’s shift away from an agrarian economy. Today, computers and related inventions are driving the information revolution and transforming the U.S. economic landscape once again.”

The study indicated that science, technology, engineering and mathematics (STEM) and healthcare professional and technical occupations are two occupational categories with the high concentrations of employees with some college or better and with high rates of growth in postsecondary attainment in the coming years.

For research universities, the new formula includes a funding factor based upon the total number of undergraduate and graduate degrees and postgraduate certificates awarded by each institution in the STEM and healthcare profession fields in the most recent year for which data is available (2009-2010). The calculation of this factor is almost identical to calculation of total awards, except the degrees are limited to Classification of Instructional Programs codes in the STEM and healthcare disciplines. The resulting calculation is funded at three percent of the total cost to produce the degrees.

At-Risk Students. The new formula includes a funding factor based upon the total number of undergraduate and graduate degrees and postgraduate certificates awarded by each institution to at-risk students. To determine degree and certificate awards that qualify for this factor, at-risk students are defined as undergraduate and graduate students who have an “expected family contribution amount” which would qualify them for a Pell grant in the year in which they earn their degree. While graduate students are not eligible to receive Pell grants, the same definition is applied to graduate students to determine if they are financially at-risk. The calculation of this factor is almost identical to calculation of total awards, except the degrees are limited to at-risk students. The resulting calculation is funded at three percent of the total cost to produce the degrees.

Institutional Contribution. Changes in workload funding needs will be adjusted to reflect changes in funding available to research universities from the state’s Land Grant Permanent Fund (LGPF). The LGPF was established to invest and distribute revenues from lands that were transferred by the federal government to New Mexico prior to statehood. Revenues derive from the sale of the lands and from royalties from leases and mineral and timber production on the lands, as well as from investment growth. Distributions from the LGPF are determined by the state constitution and other laws. LGPF beneficiaries in higher education are limited to four-year colleges and special schools.

Expansion of the Formula in 2012. During the 2012 interim, HED will work with research university leaders and staff to identify additional sector-specific formula factors. Concepts currently under discussion include a research factor, a quality factor, a progress factor and a factor that rewards success of transfer students.

COMPREHENSIVE UNIVERSITIES

Comprehensive universities are responsible for addressing regional workforce needs for highly educated individuals, including producing master’s degrees and bachelor’s degrees. A few comprehensive universities also fulfill the regional role of a community college with regard to production of associates degrees and certificates. Factors in the funding formula for comprehensive universities include:

Completed student credit hours. Completed student credit hours will be defined as for research universities, except for the categories of courses that comprehensive universities provide. In addition to undergraduate and graduate courses, comprehensive universities may also provide developmental and trade/technical courses. Comprehensive universities are also distinguished from research universities in this factor in that they do not provide doctoral courses. As with research universities, completed student credit hours will be calculated at 45 percent of the change in workload value.

Number of degree and postgraduate certificate awards. To calculate this factor for comprehensive universities, all certificates, associates degrees, bachelor’s degrees and master’s degrees produced by an institution in the most recent year for which data is available (2009-2010) are sorted into tiers, following the structure of the student credit hour tiers. An example is shown below.

2009-10						
Tier	Certificates			Assoc Degree	Bach Degree	Master Degree
	<1 Year	1-2 Years	2-4 Years			
1	23	3		43	24	15
2		9		16	14	
3		17		41		

The Funding Task Force's Finance Group cost grid relevant to comprehensive universities appears below:

	Certificates			Assoc Degree	Bach Degree	Master Degree
	<1 Year	1-2 Years	2-4 Years	2-03	3-05	4-07
Tier 1	\$4,950	\$7,260	\$14,455	\$14,455	\$33,000	\$24,434
Tier 2	\$7,143	\$10,477	\$20,860	\$20,860	\$47,623	\$35,261
Tier 3	\$10,469	\$15,354	\$30,570	\$30,570	\$69,792	\$51,675

The two grids are multiplied to estimate the cost of generating the degrees produced that year. The funding factor for FY13 represents two percent of the total cost.

Workforce Needs. For comprehensive universities, the new formula includes a funding factor based upon the total number of certificates, associates, undergraduate and graduate degrees awarded by each institution in the STEM and healthcare professional fields in the most recent year for which data is available (2009-2010). The calculation of this factor is otherwise identical to calculation of workforce needs for research universities.

At-Risk Students. For comprehensive universities, the new formula includes a funding factor based upon the total number of certificates, associates, undergraduate and graduate degrees awarded by each institution to at-risk students, defined in the same way as for research universities.

Institutional Contribution. Changes in workload funding needs will be adjusted to reflect changes in funding available to comprehensive universities the LGPF.

Expansion of the Formula in 2012. During the 2012 interim, HED will work with comprehensive universities to identify additional sector-specific formula factors. Concepts currently under discussion include a quality factor, a progress factor and a factor that rewards success of transfer students.

COMMUNITY COLLEGES

Community colleges have a distinctive mission from four-year institutions, responsible for vocational and technical education and general academic preparation leading to associate's degrees and certificates. Two-year colleges are often the first line resource in responding to the training needs of employers expanding or newly locating in the state. In New Mexico, the two-year colleges are also

responsible for providing remedial education and adult basic education. Factors in the funding formula for community colleges include:

Completed student credit hours. Completed student credit hours will be defined as for research universities, except for the categories of courses that two-year colleges provide. Two-year institutions provide lower level undergraduate courses as well as developmental and trade/technical courses. As with research universities, completed student credit hours will be calculated at 45 percent of the change in workload value.

Number of degree and postgraduate certificate awards. To calculate this factor for two-year colleges, all certificates and associates degrees produced by an institution in the most recent year for which data is available (2009-2010) are sorted into tiers, following the structure of the student credit hour tiers. An example is shown below.

2009-10				
Tier	Certificates			Assoc Degree
	<1 Year	1-2 Years	2-4 Years	
1	15	18	41	121
2	4	7	2	21
3		6		31

The Funding Task Force's Finance Group cost grid relevant to two-year colleges appears below:

2009-10				
Tier	Certificates			Assoc Degree
	<1 Year	1-2 Years	2-4 Years	
1	\$4,950	\$7,260	\$14,455	\$14,455
2	\$7,143	\$10,477	\$20,860	\$20,860
3	\$10,469	\$15,354	\$30,570	\$30,570

The two grids are multiplied to estimate the cost of generating the degrees produced that year. The funding factor for FY13 represents two percent of the total cost.

Workforce Needs. For two-year colleges, the new formula includes a funding factor based upon the total number of certificates and associates degrees awarded by each institution in the STEM and healthcare professional fields in the most recent year for which data is available (2009-2010). The calculation of this factor is otherwise identical to calculation of workforce needs for research universities.

At-Risk Students. For two-year colleges, the new formula includes a funding factor based upon the total number of certificates and associates degrees awarded by each institution to at-risk students, defined in the same way as for research universities.

Institutional Contribution. Changes in workload funding needs will be adjusted to reflect changes in funding available to two-year colleges from changes in the statutory mil levy. Independent community colleges are required to impose a minimum of two mills of property taxes in their tax districts; branch campuses impose a minimum of one mill.

Expansion of the Formula in 2012. During the 2012 interim, HED will work with community college leaders and staff to identify additional sector-specific formula factors. Concepts currently under discussion include two progress factors, an academic at-risk factor that may be applied to all sectors, and a factor that rewards success in getting students to transfer to four-year institutions.

The new funding formula can be used to implement a flat budget recommendation, such as that which will be proposed by the Higher Education Department, or can be used to allocate any new funds that may be added by the legislature in the 2012 session. It is recommended that any additional funding be distributed using this formula.

FY13 BUDGET RECOMMENDATION

In order to implement the new formula, the Higher Education Department will incorporate outcomes from the new formula into a FY13 budget recommendation that includes no funding increase from the FY12 level. The HED recommendation will begin by calculating total change in funding estimated by the new formula. The amount of the change will be adjusted out of the FY12 base budgets of higher education institutions, distributed as reductions by sector. Changes resulting from the new formula will be added back to each institution. The resulting amounts will be adjusted through a stop-loss process to ensure that no institution gains or loses more than two percent of its FY12 base level funding.

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**The Watson-Hadwiger Formula
New Mexico Higher Education Department, October 2011**

To calculate the formula for each institution:

$$D_i = \text{Base}_i + U_i + W_{ia}O_{ia}C_{ia} + W_{ib}O_{ib}C_{ib} + W_{ic}O_{ic}C_{ic} + W_{id}O_{id}C_{id} + S_i$$

To calculate the total funding generated by the formula:

$$\sum_{i=1}^n D_s = \sum_{i=1}^n \text{Base}_i + \sum_{i=1}^n U_i + \sum_{i=1}^n W_{ia}O_{ia}C_{ia} + \sum_{i=1}^n W_{ib}O_{ib}C_{ib} + \sum_{i=1}^n W_{ic}O_{ic}C_{ic} + \sum_{i=1}^n W_{id}O_{id}C_{id} + \sum_{i=1}^n S_i$$

Definition of equation terms:

D	=	Total amount of funding generated by the formula
i	=	Institution
Base	=	Base I&G Budget
U	=	Market utilities adjustment
W	=	Weight (45% of completed SCH, 2% total awards, 3% workforce, 3% at-risk)
O	=	Outcome
C	=	Cost to produce each increment of outcome
S	=	Institutional Share (LGPF, statutory mill levy change)
a	=	Completed student credit hours
b	=	Total number of certificates and degrees awarded in 2009-2010
c	=	Total workforce awards in 2009 – 2010
d	=	Total awards to at-risk students in 2009 – 2010
n	=	Number of institutions in a sector
s	=	Sector

Because the Higher Education Department has been directed to recommend a flat FY13 budget, the Base amount will not be 100% of the FY12 budget in the HED FY13 budget recommendation.

