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ABSTRACT

At the request of state legislature, the two-year branch campus of New Mexico State University at Alamogordo (NMSU-A) began using an economic impact model developed by the Eastern Association of College and University Business Officers (EACUBO) to document accountability. The EACUBO Model uses information about the institution and economic data from the local study area to produce countywide data for the college; statewide data for the college; and countywide results of economic impact. The model requires that two multipliers be selected: the first to estimate local college indirect impact; and an employment multiplier which reflects the number of jobs related to the institution. In summer 1993, NMSU-A utilized the EACUBO model to determine the economic impact on Otero county of NMSU-A and four other public educational systems. The total direct economic impact was calculated to be $24,521,994, while economic impact after adding the multiplier was calculated at $51,011,893. The total economic impact of NMSU-A was determined to be $14,411,190, with students providing 72% of the impact. The total number of jobs created due to the 5 institutions was 1,154, with 372 of these resulting directly from NMSU-A. However, exclusions from the model of such factors as expansion of the credit base of local banks due to college-related deposits, expenditures by visitors, and state and local taxes paid by employees result in an underestimation of the actual economic impact. (Contains 10 references.) (Data tables are appended.) (KP)

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ED 385 299

Using a Simple Economic Impact Model to Document Value to Policy Makers

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by

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Abstract

Higher education institutions have been pressured to document that they are accountable for the resources they expend. Many colleges have used a simple economic impact model to help do this. The model was produced by the Eastern Association of College and University Business Officers based on the work of G. Jeremiah Ryan. At the request of the state legislature, NMSU-Alamogordo used this model to calculate the direct and indirect economic impact of all public educational entities in Otero County. This included three public school districts, the state school for the visually handicapped, and NMSU-A. The paper/demonstration will show how the model works, how it was used to complete the study within two weeks, and discuss the results of this study and other studies that have used the same model.

Using a Simple Economic Impact Model to Document Value to Policy Makers

New Mexico State Representative Max Coll, Chairman of the Legislative Finance Committee in the LFC report "The Economic Impact of Higher Education in New Mexico" (1994), suggested that "estimating the economic impact of higher education is, at the same time, necessary and problematic". Institutions of higher learning have been forced to grapple with this problem. Towards this end, many colleges have used a simple Lotus 1-2-3 model to help document their economic impact in their service area. At the request of the state legislature, NMSU-Alamogordo used this model to calculate the direct and indirect economic impact of all public educational entities in Otero County. The study included Alamogordo Public School District, the Cloudcroft Public School District, Tularosa Public School District, the New Mexico State School for the Visually Handicapped, and NMSU-A. The demonstration will show how the model works, how it was used to complete the study within two weeks, and discuss the results of this study and other studies that have used the same model.

Reason for Study During summer 1993, the New Mexico State Legislature - Legislative Finance Committee (LFC) requested all public colleges and universities to study their impact on the economy of their county and state of New Mexico. Dr. David Townsend, a former NMSU-A Campus Director, and current state representative is a member of the LFC. Representative Townsend asked the Provost of New Mexico State

University-Alamogordo to consider a different approach than traditional economic impact studies. It was his desire to study the economic impact of all public educational entities in Otero County. This task was complicated by the desire to complete the study in less than 30 days. All affected CEO's agreed to provide data. The NMSU-A Office of Institutional Research completed the study within the allotted time frame and to the satisfaction of Representative Townsend and the Legislative Finance Committee.

Method

The use of an automated Lotus 1-2-3 model allowed this study to be quickly and successfully completed. This model was based on an economic impact model developed by Dr. G. Jeremiah Ryan (Ryan, 1983a; Ryan, 1993b; Ryan, 1985). The major strength of the Ryan model is that it is not necessary to employ the complex Caffrey and Isaacs methodology as reported in 1971 in Estimating the Impact of a College or University on the Local Economy. Ryan's simplified approach more efficiently utilizes data that are already available at the community college. Therefore the model does not require extensive local surveys of college employees and students. The savings in time and personnel resources are considerable. This model has been utilized by many community colleges.

The Eastern Association of College and University Business Officers (EACUBO) developed a Lotus 1-2-3 computer model based on the Ryan model that can be used by all colleges. EACUBO's reasons for developing the model are explained in The Economic Impact of Colleges on Their Communities and State:

> In 1989 the Two-Year College Committee of EACUBO identified the need for community colleges, as well as four-year institutions, to prepare economic impact studies to determine the economic impact of their institutions upon the counties and the states in which they are located. The committee was impressed with a study that had recently been completed for the community colleges within New York state by the two-year college development center located on the campus of SUNY Albany. Dr. Gene Winter conducted the study using a model developed by Dr. G. Jeremiah Ryan, Vice President for Institutional Advancement, Monroe Community College, which had been used in New Jersey and Kansas. As the manipulation of the data in that study was done by hand rather than by computers, the committee decided to prepare a system to compute the economic impacts (1989).

The EACUBO Model can be used by higher education institutions that are interested in using a reasonable and defensible approach without using the entire complex Caffrey and Isaacs methodology. "Three major expenditure components were used to estimate direct economic impact: college budgetary expenditures, college employee expenditures and student expenditures. Indirect economic impact (adjusted economic impact) was estimated when direct economic impact was adjusted using an economic multiplier. The model also estimates the number of jobs created by the college's economic activity" (Andrews & Lillibridge, 1990).

The model relies on two input survey forms [see Appendix A]. The "Survey Form" is used to provide specific information about the institution. The second form, "Preliminary Data for Detail Worksheet" is used to provide economic data about the local study area. The researcher loads these files in to Lotus 1-2-3 and enters the appropriate data. The model produces three reports: Countywide Data for Individual

College, Statewide Data for Individual College, and Countywide Results of Economic Impact Study.

The EACUBO model documentation and the diskette are available at a cost of $20.00 each and may be ordered from the Dean of Administration, Jamestown Community College, Jamestown, New York 14701.

Selecting a Multiplier

The model requires that two multipliers be selected for the local study area and the state. Each actual dollar spent is subsequently re-spent several times in the economy as providers of goods or services pay employees and, in turn, they purchase other goods or services. Economists use a multiplier to estimate this recycling effect. This effect is graphically depicted in Figure 1. The following paraphrases a description of this effect:

> After the first dollar transaction, 75 cents may be re-spent in the state with taxes and leakage to other geographic regions accounting for the other 25 cents. The next cycle may have 2/3 of the 75 cents or 50 cents re-spent in the state, and perhaps 25 cents spent again on a subsequent transaction. This re-spending results in a total in-state impact of $1.50 more than the original dollar, or a total direct and indirect economic impact of $2.50. (Kansas Council of Community College Presidents, 1985)

The first multiplier is used to estimate local college indirect impact. The most current data will come from the U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Analysis Division in Washington [phone 202-606-5343 see September 23, 1993 Memorandum in Appendix B]. In this manner, it was possible to

obtain the specific "final-demand multiplier" for Colleges, Universities, and Professional schools (77.0402) for the State of New Mexico. The multiplier we used was 2.0169. It should be noted that the multiplier used for Elementary and Secondary Schools (2.1063) is different from that used for colleges and universities. If it is necessary to get a multiplier about a more specific geographical area, for a fee, the Bureau of Economic Analysis can determine the specific multiplier for different locations in states. This may make the estimate of economic impact more accurate.

There is also an employment multiplier. This reflects the number of jobs related to the institution. This final multiplier is based on the idea that expenditures by the college, its students and employees, increase economic activity which in turn result in the creation and support of additional jobs. This information was also provided by the Bureau of Economic Analysis. Elementary and secondary schools used 45.0 and colleges and universities used 52.1. In other words, 52.1 new jobs were created for each million dollars of output (Direct Economic Impact). This number was entered into the model as .0000521.

Calculate Disposable Income Spent in the County

The model needed to be updated to calculate the average percent of disposable income spent in the county. It was not possible to obtain data about Otero county; however, data about Dona Ana County, an adjacent county was used. The average percent of disposable income spent in Otero County was estimated by dividing "Retail Sales Per Household-1991" by "Average Household Effective Buying Income-1991".

Both data elements were found in 1996 Projections, Sales and Marketing Management (1992). Average Household Effective Buying Income is defined as disposable personal income. College employees living in the county, and in New Mexico, multiplied by the percentage derived above, resulted in estimates of non-housing expenditures by employees (Fadale & Winter (1988); Andrews & Lillibridge, 1990).

Results

The total direct economic impact of the five public educational institutions was $24,521,994. After the mulitiplier was applied, the total economic impact was $51,011,893. The total jobs created in Otero County by economic activity of public education was 1,154. The results of the Otero County economic study are summarized in Table 1. Figure 2 shows the relative relationship of the education entities in terms of economic impact. Alamogordo Public Schools (APS) generated $24,608,615 of total economic impact. This was the highest amount in the study. Figure 3 shows that NMSU-A accounted for a total economic impact of $14,411,190. Students provided 72% of the impact. The Tularosa Public Schools generated $5,818,921. The New Mexico School for the Visually Handicapped produced a total of $4,508,691. The Cloudcroft Public School District generated $1,664,476 of total economic impact in Otero County. Lotus 1-2-3 printouts about NMSU-Alamogordo economic impact produced by the model are presented in the Appendix C.

Other educational institutions have used economic impact study methodology that is based on the work of Dr. G. Jeremiah Ryan (Ryan, 1983a; Ryan, 1983b; Ryan,

1985). Results from the El Paso Community College Economic Impact Study are shown in Figure 4 (Andrews & Lillibridge, 1990). This study showed that the college had total economic impact of $271,102,146 (Andrews & Lillibridge, 1990). The Direct Economic Impact of New Jersey's Community Colleges (Ryan, 1983b), Ryan's doctoral dissertation, paved the way for more simplified and less costly economic impact studies. Figure 5 shows that the total impact of New Jersey community colleges was $822,054,857.

Limitations

The model documentation refers to publications that were current in 1989. To effectively use the model now, the researcher must update appropriate sources. The model is very conservative. According to Economic Impact of Colleges on Their Communities and State, (1989),

> "any study of this type only provides estimates of the real economic impact that colleges have on an area. **Not included** in this model are the following:
>
> - expansion of the credit base of local banks due to college-related deposits
>   - expenditures by visitors to college-related events
>   - college employee investments in real property (home ownership)
>   - state and local taxes paid by employees
>   - increases in sales tax revenue due to college-related expenditures
>   - estimates of tax revenues foregone because of college property being tax-exempt
>
> These exclusions insure underestimation of the actual economic impact while simplifying data collection."

References

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Kansas Council of Community College Presidents, (1985). The economic impact on the Kansas community colleges on the counties and state of Kansas, fiscal year 1983-84. Overland Park, KS: Office of Institutional Research, Johnson County Community College.

Legislative Finance Committee, (1994). The economic impact of higher education in New Mexico. New Mexico State Legislature, Legislative Finance Committee.

Ryan, G. (1983a). The direct economic impact of New Jersey's community colleges (Doctoral dissertation, Nova University, 1983). (ERIC Document Reproduction Service No. ED 233 774)

Ryan, G. (1983b). A study of the economic impact of the community colleges on the state of New Jersey. Lincroft, NJ: Brookdale Community College.

Ryan, G. (1985). A shortcut to estimating economic impact. Community/Junior College Quarterly, 9, pp. 197-214.

Staff. (1992, October 26). 1996 projections. Sales and Marketing Management, p. 76. [a more recent edition is: October 28, 1994]

Two-Year College Committee of the Eastern Association of College and University Business Officers, (1989). The economic impact of colleges on their communities and states. Jamestown, NY: EACUBO.

Table 1

Estimated Economic Impact for Public Education on Otero County

(Based on data provided by institutions- September 1993)
(Data generated with EACUBO Economic Impact Model)

	NMSU-Alamogordo Branch	School for the Visually Handicapped	Alamogordo Public Schools	Cloudcroft Public Schools	Tularosa Public Schools	Total
A. Total Student Activity Expenditures in County:	8,027	12,793	278,098	8,599	34,749	342,266
B. Institution Expenditures in County:	426,648	920,080	2,625,008	129,344	1,184,210	5,285,290
C. Total In-County Expenditures by Institution:	434,675	932,873	2,903,106	137,943	1,218,959	5,627,556
D. Disposable Income of In-County Employees Spent In County On Non-housing Items:	1,374,761	996,767	7,578,929	572,599	1,288,311	11,811,367
E. Expenditures Of Out-of-County Employees in County on Non-housing Items:						
a. Full-Time:	3,000	13,000	0	1,000	0	17,000
b. Part-Time:	4,500	2,000	0	0	0	6,500
F. Rental Expenditures by Full-time Institution Staff Living in County:	184,692	195,934	1,201,303	78,695	255,357	1,915,981
G. Total Employee Expenditures:	1,566,953	1,207,701	8,780,232	652,294	1,543,668	13,750,848
H. Total Expenditures By Full-time Students:	3,204,990	0	0	0	0	3,204,990
I. Total Expenditures by Part-time Students:	1,938,600	0	0	0	0	1,938,600
J. Total Expenditures by Students:	5,143,590	0	0	0	0	5,143,590
K. Total Direct Economic Impact of the Institution on the County:	7,145,218	2,140,574	11,683,338	790,237	2,762,627	24,521,994
L. Multiplier Effect:	2.0169	2.1063	2.1063	2.1063	2.1063	
M. Total Estimated Economic Impact:	14,411,190	4,508,691	24,608,615	1,664,476	5,818,921	51,011,893
N. Full-time Employees Living in County:	150	136	808	50	170	1,314
O. Jobs Related to Institution:	372	96	526	36	124	1,154
P. Total Full-time Employment Related to Institution:	522	232	1,334	86	294	2,468

TABLE 1

FIGURE 2

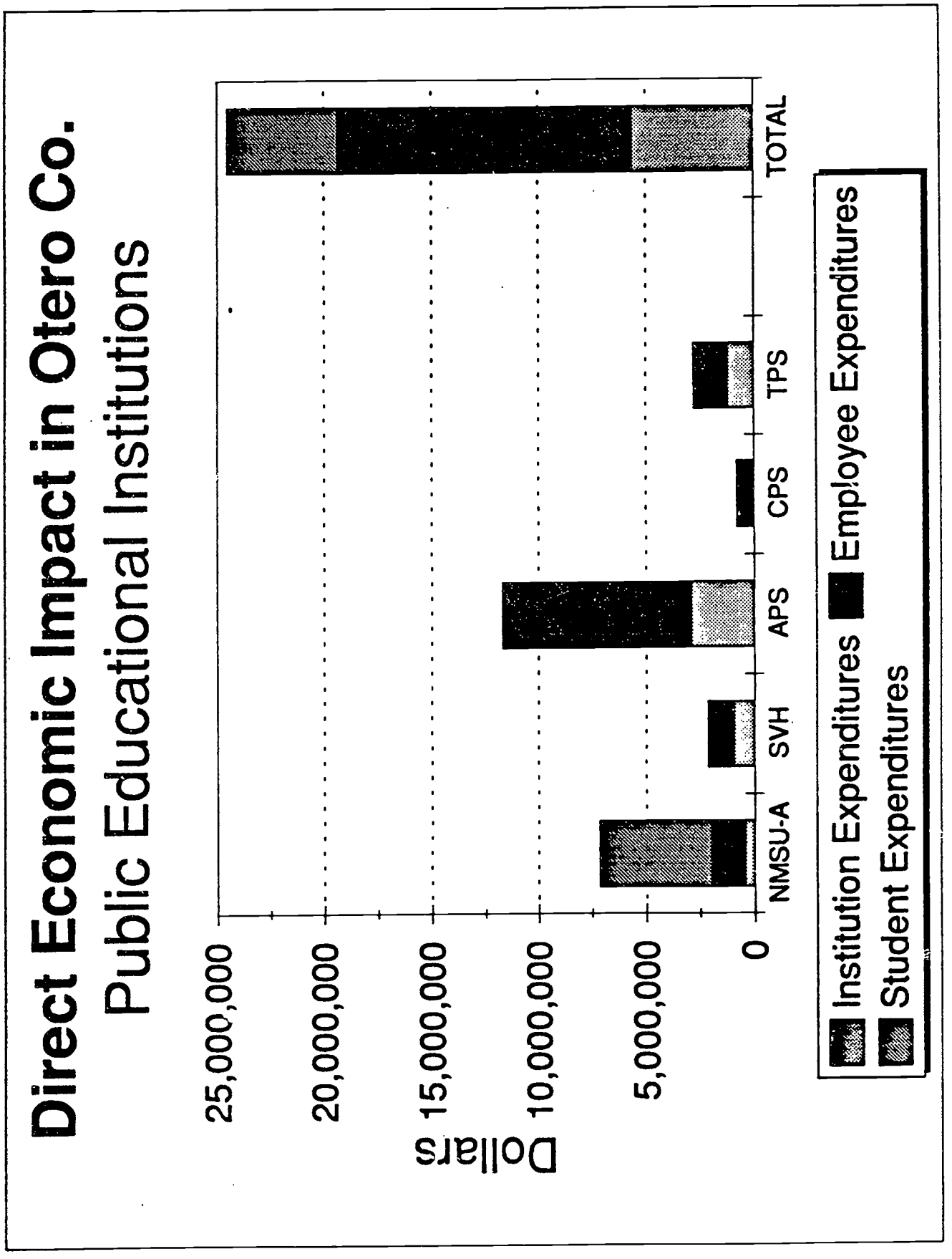
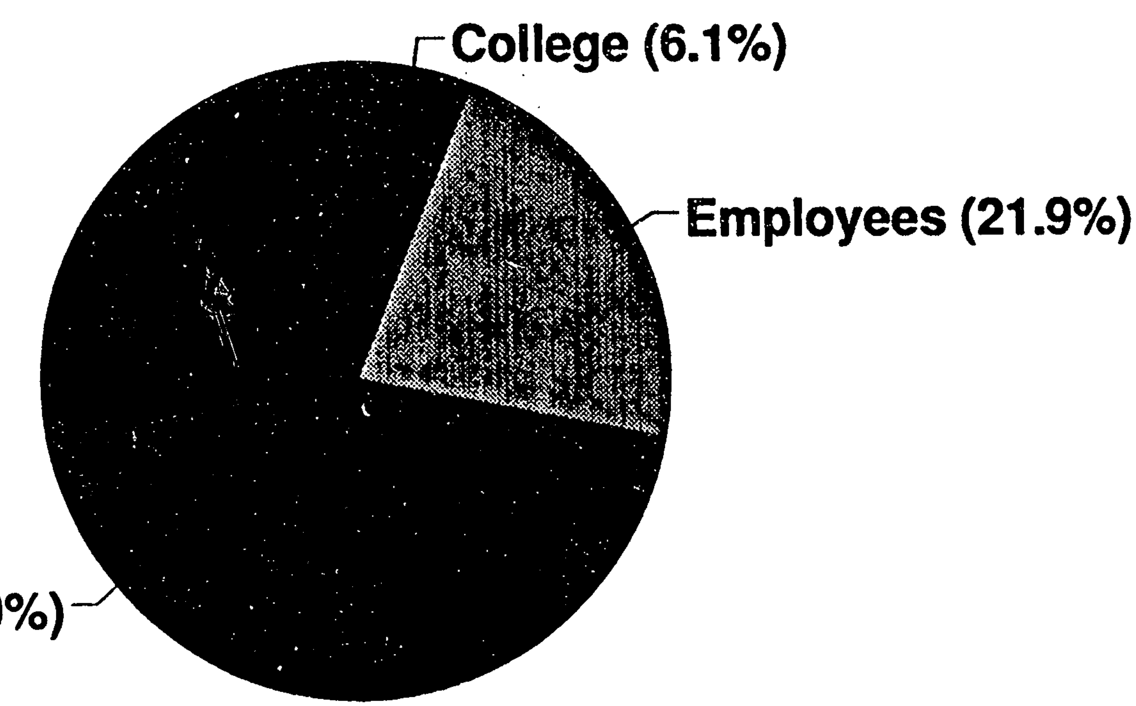

Direct Economic Impact in Otero Co.
Public Educational Institutions
Dollars
25,000,000
20,000,000
15,000,000
10,000,000
5,000,000
0
NMSU-A
SVH
APS
CPS
TPS
TOTAL
Institution Expenditures
Employee Expenditures
Student Expenditures

FIGURE 3

Economic Impact in Otero Co., NM

NMSU-Alamogordo - 1992

Total Impact =$ 14,411,190



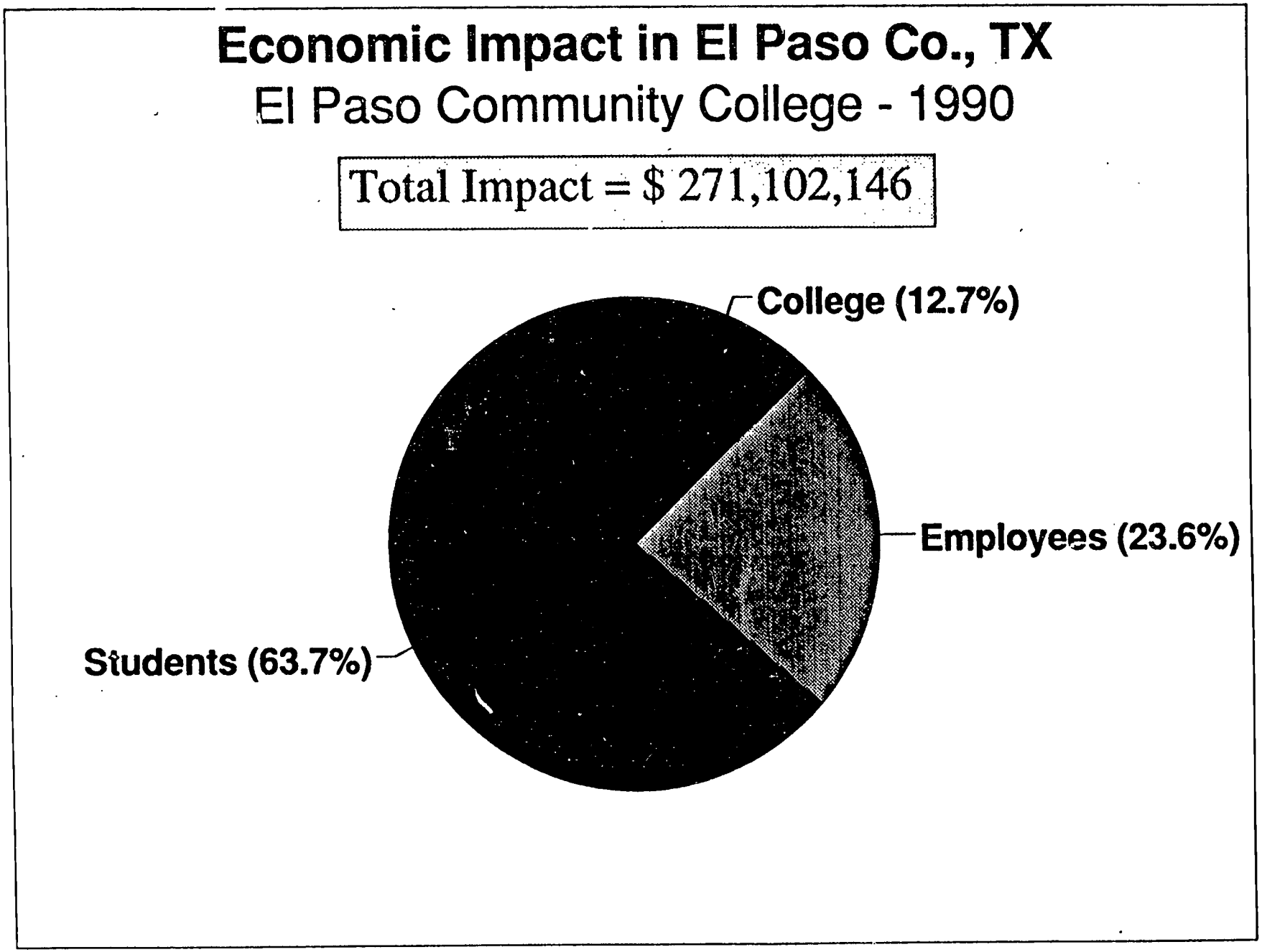

Economic Impact in El Paso Co., TX
El Paso Community College - 1990
Total Impact = $ 271,102,146
College (12.7%)
Employees (23.6%)
Students (63.7%)

FIGURE 4

Economic Impact on New Jersey

NJ Community Colleges

Total Impact = $ 822,054,857

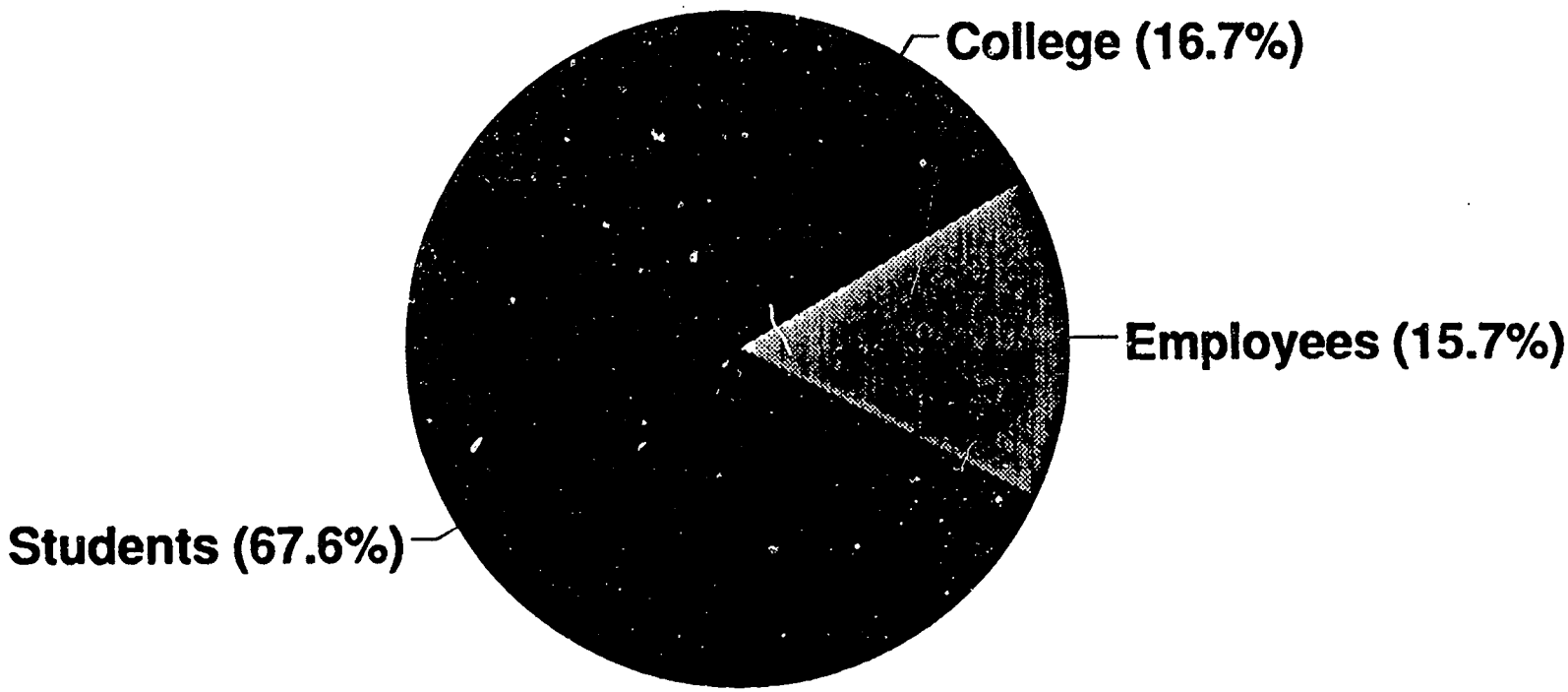


FIGURE 5

SURVEY FORM
NMSU-Alamogordo Branch

1.	College Expenditures:	$1,720,354
2.	Total Student Activity Expenditures:	$32,365
3.	Percentage of College Expenditures --	
	a. in sponsor area:	25%
	b. in State:	43%
	c. out-of-state:	58%
4.	Number of College Employees --	
	a. full-time:	118
	b. part-time:	146
	c. TOTAL NUMBER:	264
	d. FTE for above:	156
5.	College Employees Who Live --	
	in sponsoring county (ies) --	
	a. full-time:	115
	b. part-time:	137
	c. TOTAL:	252
	d. FTE for above:	150
	in State--	
	a. full-time:	118
	b. part-time:	146
	c. TOTAL:	264
	d. FTE for above:	156
6.	Tocal Disposable Income Available to Employees:	$3,019,632
7.	Number of Students --	
	a. full-time	745
	b. part-time:	1,350
	c. TOTAL:	2,095
8.	Average Annual College-related Expenditures by Full-time Students:	$4,302
9.	Average Annual College-related Expenditures by Part-time Students:	$1,436
10.	Revenue From Students:	$1,533,436
	Revenue From Local Governments:	$245,557
	State Aid:	$3,553,089
	Revenue From Other Sources Within State:	$51,108
	Revenue From Out-of-state Sources:	$380,836

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PRELIMINARY DATA FOR DETAIL WORKSHEET

For Part D:	Estimate of % of Employee Expenditures IN COUNTY (estimated from Sales and Markting Management, Oct. 26, 1992):	47.21%
For Part E:	Total Number of out-of-County--	
	Full-time employees:	3
	Part-time employees:	9
	Total Number of out-of-State--	
	Full-time employees:	0
	Part-time employees:	0
	Annual Expenditures in Service Area by employees residing out of Service Area-- (Estimates)	
	Full-time employees expenditures:	$1,000
	Part-time employees expenditures:	$500
For Part F:	Census Data -- (1990)	
	Percentage Who Rent in County:	37.70%
	Median Monthly Rent in County:	$355
For Part L:	Multiplier Effect:	2.02
	State Multiplier Effect (Part J):	2.02
For Part P:	Multiplier for Jobs related to College: (Regional Multipliers: A User Handbook, US Dept of Commerce, p. 36 RIMS II May 1992)	0.0000521

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UNITED STATES DEPARTMENT OF COMMERCE
Bureau of Economic Analysis
Washington, D.C. 20230

September 23, 1993

MEMORANDUM FOR Fred Lillibridge

FROM: Zoe Ambargis

SUBJECT: RIMS II Multipliers for the State of New Mexico

IO Industry number	Final-demand multipliers			Direct-effect multipliers	
	Output/1/ (dollars)	Earnings/2/ (dollars)	Employment/3/ (number of jobs)	Earnings/4/ (dollars)	Employment/5/ (number of jobs)
77.0401	2.1063 ✓	.6864	45.0 ✓	2.0018	1.7985
77.0402	2.0169 ✓	.8137	52.1 ✓	1.5794	1.5194

I-O number 77.0401 *Elementary and secondary schools*; I-O number 77.0402 *Colleges, universities, and professional schools*

1. Each entry in column 1 represents the total dollar change in output that occurs in all row industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

2. Each entry in column 2 represents the total dollar change in earnings of households employed by all row industries for each additional dollar of output delivered to final demand by the industry corresponding to the entry.

3. Each entry in column 3 represents the total change in number of jobs in all row industries for each additional 1 million dollars of output delivered to final demand by the industry corresponding to the entry. Because the employment multipliers are based on 1989 data, the output delivered to final demand should be in the same year dollars.

4. Each entry in column 4 represents the total dollar change in household earnings that occurs in all row industries for each additional dollar of earnings of households employed by the industry corresponding to the entry.

5. Each entry in column 5 represents the total change in number of jobs in all row industries for each additional job in the industry corresponding to the entry.

COUNTYWIDE DATA FOR INDIVIDUAL COLLEGE
NMSU-Alamogordo Branch

A.	Total Student Activity Expenditures in County:	$8,027
B.	College Expenditures in County:	$426,64[illegible]
C.	Total In-County Expenditures by College:	$434,675
D.	Disposable Income of In-County Employees Spent In County On Non-housing Items:	$1,374,761
E.	Expenditures Of Out-of-County Employees in County on Non-housing Items:	
	a. Full-Time:	$3,000
	b. Part-Time:	$4,500
F.	Rental Expenditures by Full-time College Staff Living in County:	$184,692
G.	Total Employee Expenditures:	$1,566,953
H.	Total Expenditures By Full-time Students:	$3,204,990
I.	Total Expenditures by Part-time Students:	$1,938,600
J.	Total Expenditures by Students:	$5,143,590
K.	Total Direct Economic Impact of the College on the County:	$7,145,218
L.	Multiplier Effect:	2.02
M.	Total Estimated Economic Impact:	$14,411,190
N.	Full-time Employees Living in County:	150
O.	Total Economic Impact of the College in the County:	$7,145,218
P.	Jobs Related to College:	372
Q.	Total Full-time Employment Related to College:	522
R.	Ratio of Sponsor Contribution to Total Economic Impact:	$1.00 to $58.69

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SUMMARY
COUNTYWIDE RESULTS OF ECONOMIC IMPACT STUDY

COLLEGE: NMSU-Alamogordo Branch

Expenditures		
College budgetary expenditures (excluding salaries, wages and taxes)	$434,675	
Employee (non-housing, rental by full/part-time, in-county by employees living out-of-county)	$1,566,953	
Student expenditures (living and book allowances, excluding tuition and fees)	$5,143,590	
* Direct Economic Impact		$7,145,218
Multiplier		2.02
* Total Estimated Economic Impact		$14,411,190
Total existing FTE positions	150	
Jobs attributable to college	372	
* Total Job Opportunities		522
* Ratio of Total Economic Impact to Local Sponsor Revenue	$245,557	$58.69 to $1.00

****

STATEWIDE DATA FOR INDIVIDUAL COLLEGE
NMSU-Alamogordo Branch

A.	Total Student Activity Expenditures in State:	$13,917
B.	College Expenditures in State:	$739,752
C.	Total In-State Expenditures by College:	$753,669
D.	Employee Non-housing Expenditures:	$1,429,751
E.	Expenditures Of Out-of-State Employees in State on Non-housing Items:	
	a. Full-Time:	$0
	b. Part-Time:	$0
F.	Rental Expenditures by Full-time College Staff Living in County:	$189,510
G.	Total Employee Expenditures:	$1,619,261
H.	Total Expenditures By Full-time Students:	$5,143,590
I.	Total Direct Economic Impact of the College on the State:	$7,516,520
J.	Multiplier Effect:	2.02
K.	Total Estimated Economic Impact:	$15,160,069
L.	FTE Living in State:	156
M.	Jobs Related to College:	392
N.	Total Full-time Employment Related to College:	548

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