

EMBARGOED UNTIL APRIL 17, 2002

What Do College Graduates Know?
A Survey of Arizona Universities

By

Michael K. Block
Professor of Economics and Law
University of Arizona

Robert J. Franciosi

with

Melissa Geiger

Introduction

This report is an examination of how much those graduating from Arizona's three public universities—the University of Arizona, Arizona State University (ASU) and Northern Arizona University (NAU)—know about history, science, math, literature, arts, civics and other subjects. In other words, have they received a well-rounded, liberal education?

This is not another missile launched against political correctness in America's universities, nor is it a tirade against lefty professors. Rather, it is a test to see what Arizona taxpayers are getting in return for their support of the state's universities. From kindergarten through graduate school, public funding for education is justified on the grounds that education is the cement needed to hold a democratic society together. To be sure, educated workers are more productive workers. However, this cannot be considered a benefit to state taxpayers in general, since the benefits of greater productivity will accrue entirely to students in their future paychecks. In addition there are government-subsidized loans and grants, even for schools in astrology, to help students overcome the short-run costs that are barriers to obtaining greater skills. Presumably, the reason the State of Arizona subsidizes undergraduate education is not to make students wealthier, but to instill in them the knowledge and understanding that will make them more responsible citizens.

Forty-five years ago Nobel Laureate Milton Friedman, in a seminal essay on school choice, wrote:

EMBARGOED UNTIL APRIL 17, 2002

Public expenditure on higher education can be justified as a means of training youngsters for citizenship and for community leadership—though I hasten to add that the large fraction of current expenditure that goes for strictly vocational training cannot be justified in this way or, indeed, as we shall see, in any other.¹

Spillovers and spin-offs from the universities that benefit the state, such as science or technology, are also used to justify public subsidies. However if these are indeed important, taxpayers can make more efficient use of their money by supporting research parks, or even graduate education, with a focus on especially productive research fields, instead of spending money on undergraduate education and its plethora of auxiliary services.

This report finds our universities do a spotty job of applying social cement. The vast majority of students surveyed earned a failing grade on our test of general knowledge and reasoning. Students only achieved a passing grade in four of eleven subject areas, and showed a dismaying lack of knowledge in vital subjects such as American history and quantitative analysis. Clearly reform is needed, and at the conclusion of this report we make several recommendations to help ensure that undergraduates at public universities graduate with a shared store of fundamental knowledge.

¹ Milton Friedman (1955) “The Role of Government in Education,” in Robert A. Solo ed. *Economics and the Public Interest*, Rutgers University Press.

Background

Many studies have looked at what the modern American undergraduate knows about history and culture. *The Dartmouth Review* has conducted several surveys of that school's undergraduates, and recently, the American Council of Trustees and Alumni examined what students at America's elite schools know about American history. The particular origin of this report lies in a study written by Arizona State University Professor Marianne Jennings and released by the Arizona Association of Scholars, which found:

- *The three state universities have no meaningful core requirements in mathematics, natural sciences, social sciences, literature, art, music, history, philosophy and comparative religion.*
- *The essential disciplines of the arts, humanities, and social sciences are consistently neglected in the core requirements of all the universities examined.*
- *Only the University of Arizona imposes a foreign language requirement; and no state university requires the study of American history or government, while all three institutions emphasize and/or require cultural or gender diversity courses.*
- *The courses that meet the traditional disciplinary requirements of higher education are lacking the prerequisites and grounded more in pop culture than intellectual stimulation and pursuits.²*

² Arizona Association of Scholars (2000) *The Dissolution of General Education: A Review of Arizona's Three State Universities' Programs of Study and Degree Requirements.*

EMBARGOED UNTIL APRIL 17, 2002

The response to these findings, in part, was the assertion that although the requirements were not formally set down in the course catalog, Arizona's college students nevertheless received a well-rounded education. This report is a test of that claim.

The Survey

In order to find out what seniors at Arizona's public universities know, we developed a survey of 40 multiple-choice questions. Harvard University, interestingly enough, has one of the most traditional liberal education requirements of the elite American universities, so we used its core curriculum as a rough guide for the subject fields to cover, and the weight to give each.³

Survey questions were taken from the following sources:

- The *Elite College History Survey* conducted in 2000 for the American Council of Trustees and Alumni;
- The National Assessment for Educational Progress;
- Study guides for the College-Level Examination Program (CLEP) and the Foreign Service Written Examination and Assessment Procedure;
- The Cultural Literacy Test created by the Core Knowledge Foundation;
- The Dartmouth Review's regular polls of the general knowledge of Dartmouth undergraduates;
- The authors of this report.

³ Robert Allgyer (1999) "Dartmouth Second in Cultural Literacy," *The Dartmouth Review*, January 13, www.dartreview.com/issues/1.13.99/cultlit.html.

EMBARGOED UNTIL APRIL 17, 2002

We provided a sample of 70 questions to a panel of scholars at the Goldwater Institute and the Arizona Association of Scholars. The panel edited the sample to contain 40 survey questions. We then tested the survey on a group of college seniors to determine the difficulty of the questions. Per the results of the trial survey, we deleted and added some questions. For questions from sources with previous results—the Dartmouth Review’s polls and the Elite College History Survey—we the results as a guide so as not to choose the hardest or easiest questions. The final questions and their sources are given in the appendix.

The survey was administered in April and May of 2001 on the three Arizona public university campuses, Arizona State University, Northern Arizona University, and University of Arizona. Respondents were recruited at random via newspaper advertisements, class announcements, fliers, walking by, or word of mouth.

The survey was given in space rented on-campus. Students were asked upon arrival the number of credit hours they had earned, in order to ensure that they were indeed classified as seniors. Respondents were given a time limit of two hours, and instructed on how they would be compensated. Students were paid in cash, \$5 for completing the survey and \$.50 for each right answer, rounded to the nearest dollar. The payment was an incentive to ensure that students put some thought into answering the questions. Economists, psychologists and others have found monetary rewards for student subjects induces more thoughtful and calculated action and reduces the variance of responses.⁴ When the students completed the survey, it was graded by the administrator and the student was given the money he earned immediately.

⁴ Vernon L. Smith and James M. Walker (1993) “Monetary Rewards and Decision Cost in Experimental Economics,” *Economic Inquiry*, **31**(April), pp. 245-261.

EMBARGOED UNTIL APRIL 17, 2002

A total of 167 students took the survey. Summary statistics of our sample are given in the Table 1. Our sample includes proportionally more University of Arizona students and men than the state's actual university population. Our sample reflects the overall student population in terms of residency, except the proportion of foreign students is twice that of the actual population. Our sample included a greater proportion of business students and a smaller fraction of education and fine arts majors than is found in the student population as whole; the fraction of science, engineering and liberal arts majors in our sample is nearly the same as the actual proportions. The differences in our sample from the actual population were due to our recruiting methods and were not intentional. As we shall see later, the differences between our sample and the population have no effect on our findings.

Student's grade point average (GPA) was obtained as a categorical variable. We asked the students to place themselves in one of the five grade point average categories shown in Table 1. The weighted average of students' GPAs in our sample is slightly above the average of the senior class in the state's universities.

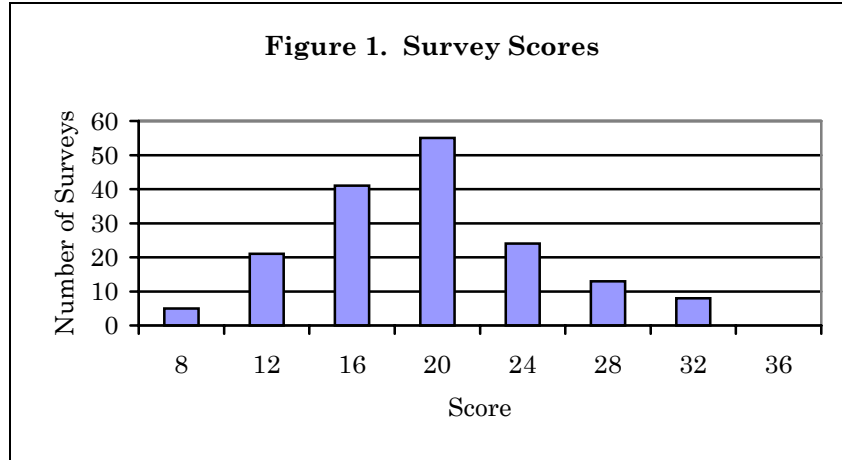
Since this is a survey of seniors, we would expect students with low grade point averages to have been weeded out. However, nearly two-thirds of our sample had GPA's above 3.0—what used to be the threshold for graduating with honors, and nearly a third of our sample will graduate *cum laude*. We will see that these high honors are not reflected in the results of our survey. These results are further indication of the grade inflation that has taken place in state universities.

EMBARGOED UNTIL APRIL 17, 2002

Table 1. Summary Statistics		
	Fraction of sample	Actual
School		
University of Arizona	44%	34%†
Arizona State	39%	46%†
Northern Arizona	17%	20%†
Men		
	53%	46%‡
Arizona residents		
	80%	77%‡
Foreign students		
	7%	3.1%‡
Discipline		
Business	32%	22.2%*
Education	5%	10.3%*
Engineering	7%	7.5%*
Fine arts	3%	6.1%*
Science	12%	10.5%*
Humanities and social sciences	41%	37.9%*
GPA		
0.0-2.0	1%	
2.01-2.5	5%	
2.51-3.0	29%	
3.01-3.5	33%	
3.51-4.0	32%	
Mean	3.19**	3.08***
† Relative sizes of 1999-2000 graduating classes.		
‡ Weighted average of total undergraduate enrollment.		
* Weighted average of 1999-2000 graduating classes. Numbers do not add up to 100% due to unsampled majors.		
** Weighted average of midpoints.		
***Weighted average of senior classes.		

Results

The highest score on our survey—34 questions correct, or 85 percent of the questions asked—was achieved by three students; the lowest score was 8 correct answers, with five students scoring below 12, or 30 percent; the average was 21, or 53 percent of questions asked. When the actual population values given in Table 1 are substituted into the regression equation in Table 6, the predicted score is practically equivalent: 52.8 percent. Our findings are robust despite the differences in demographics between our sample and the overall student population. The distribution of scores is given in Figure 1.

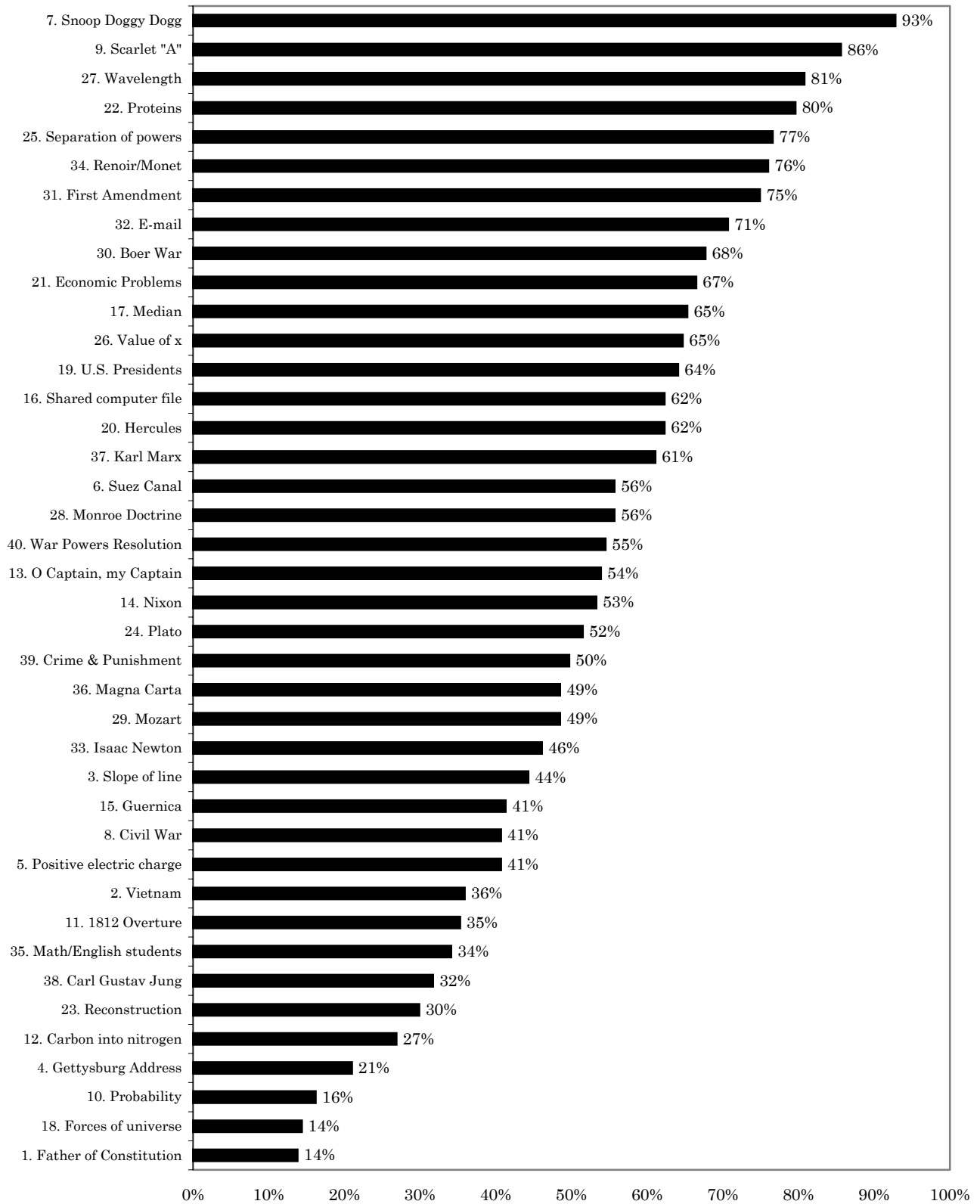


If students were assigned letter grades based on their performance, none would receive an A (90 percent); eight, or barely 5 percent, would earn B's (80 percent); 13 would earn a C (70 percent); 24 a D (60 percent); and 122, or 73 percent of students taking the test, would have failed (less than 60 percent).⁵ Some may argue since no student answered all the questions correctly, that the test, despite our best intentions, was biased toward difficult questions, and that it is unreasonable to expect the average student to score 75 percent. However, even if the top score of 34 were treated as a perfect score, only nine students, or 5 percent, would get A's; 12 would get B's; 24 would get C's; and 38 would get D's. Eighty-four, or 50 percent, would still fail.

⁵ The customary scale, also used by the Elite College History Survey.

EMBARGOED UNTIL APRIL 17, 2002

Figure 2. Correct Answers to Questions



EMBARGOED UNTIL APRIL 17, 2002

Question	Original Survey	Arizona Students
1. Father of Constitution	23%	13%
4. Gettysburg Address	22%	22%
7. Snoop Doggy Dogg	98%	92%
23. Reconstruction	29%	29%
28. Monroe Doctrine	62%	56%
36. Magna Carta	56%	49%
Average	48%	43%

Question	Original Survey	Arizona Students
8. End of Civil War	60%	42%
11. 1812 Overture	38%	35%
18. Four forces of universe	20%	15%
30. Boer War	53%	67%
33. Inventor of calculus	55%	46%
34. Impressionism	70%	60%
38. Jung	29%	32%
Average	46%	42%

Figure 2 shows how many students answered each question correctly. It should be no surprise that students did best on the pop culture question—identifying the rapper Snoop Doggy Dogg. The exceedingly high percent of correct answers on this question does indicate that the problem with the students in our sample is not that they lack intellectual ability, but rather that they have not been exposed to a serious liberal arts program.

Our sample also knew what the scarlet “A” on Hester Prynne’s dress represented; and an impressive number knew that the color of light was due to its wavelength. However, three times as many could recognize a quote by Karl Marx than Abraham Lincoln; and only 14 percent could identify James Madison as being considered the father of the Constitution. There were 17 questions that fewer than half of the students

EMBARGOED UNTIL APRIL 17, 2002

answered correctly. Of these, four were questions in American history, and seven were in science and math.

Tables 3 and 4 compare Arizona students to those in other schools. Table 3 compares how well Arizona students did on the six questions taken from the Elite College History Survey to the results from the original survey. Table 4 compares Arizona students to those who have taken the Dartmouth Review's poll. Although in some questions Arizona students score as well, if not better, on average, Arizona students performance on these questions was below that of their peers in more selective schools.

In order to find out if students were particularly strong or weak in certain subjects, we divided our questions into eleven topic areas. Table 5 gives the average scores for each. Leaving aside the pop culture category, Arizona graduates earn passing marks in only three of the ten academic categories. After the single pop culture question, students did best on the three civics questions. Each question was answered correctly by over 50 percent of those taking the survey, and two were answered correctly by over 70 percent. The high scores on the information age questions are to be expected from computer-savvy youth. The high score in literature is driven by the large number of students knowing the meaning of the scarlet "A"; remove that question and the average falls to 55 percent correct.

EMBARGOED UNTIL APRIL 17, 2002

Table 5. Average Correct by Subject

Subject	Average Correct	Questions
Pop culture	92.0%	7
Civics	69.3%	25, 31, 40
Computer literacy	67.5%	16, 32
Literature	63.3%	9, 13, 20, 39
World history	58.0%	30, 36
Social sciences	52.5%	21, 24, 37, 38
Science	47.7%	5, 12, 18, 22, 27, 33
Music and art	46.0%	11, 15, 29, 34
Geography	46.0%	2, 6
Quantitative analysis	45.8%	3, 10, 17, 26, 35
American history	40.1%	1, 4, 8, 14, 19, 23, 28

The fact that American history ranks last is a sad result of the lack of an American history requirement in Arizona’s universities found by the Arizona Association of Scholars. More students knew where the Boer War was fought than knew the correct answer to any of the seven questions on American history. Arizona students are not alone in their ignorance of their past. The Elite College History Survey found a woeful lack of knowledge of our nation’s history among students in the elite schools.⁶

This lack of a foundation in history points to a failure in the mission of our public universities to supply the civil cement to hold a democratic society together. If publicly supported education is to create better citizens, one thing those citizens should have is a shared memory of how our nation has come to where it is today. Three of the questions in our survey dealt with the American Civil War—the second most important event in our nation’s history, whose effects are with us today both in large ways and in small. Yet less than half of those surveyed knew when the war ended; less than a third knew what the Reconstruction was; and little more than a fifth could identify a quote from the Gettysburg Address.

EMBARGOED UNTIL APRIL 17, 2002

Given this level of understanding, how well can graduates be expected to understand modern race relations, the debate over reparations for slavery, the controversy over how sympathetic cabinet officers are to the Confederacy, or even the context of question 13 of our survey: Walt Whitman's poem "O Captain, My Captain." As a recent column in the *Financial Times* put the matter: "If Americans had a better understanding of their own history, the idea [of reparations] would impress nobody."⁷

This deficiency in American history is even more inexplicable considering that history is not a difficult subject to teach. It doesn't require learning a new language, the Greek alphabet or an obscure jargon. Given that there is over 200 years of events to choose from, there should be enough violence, passion and controversy to interest the average post-adolescent.

Arizona taxpayers have a right to expect that after subsidizing a student's college education to the tune of \$7,000 to \$10,000 per year the student have more than an 8th grade knowledge of American history. While our seven questions are far from a comprehensive test, they are designed to sample a student's knowledge and to assess whether a student has enough factual knowledge to facilitate further study. The results, as was noted before, are disappointing on both scores.

Critics might counter that knowing how to reason is more important than recalling mere facts, and dismiss most of the survey as an exercise in trivia. Although the merits of this argument are not obvious, this cannot be said about the quantitative analysis category, which ranks as the second lowest in average scores. Although nearly two-thirds were able to do a simple algebra problem, over 65 percent did not get the correct

⁶ American Council of Trustees and Alumni (2000) *Losing America's Memory: Historical Illiteracy in the 21st Century*.

EMBARGOED UNTIL APRIL 17, 2002

answer to a question in quantitative reasoning (question 35), and over 80 percent were unable to answer a question in simple probability (question 10). Both questions are good tests of the reasoning power of students even though they may not have taken a class in probability and been formally exposed to urns and dice.

In the “Information Age,” numeracy is every bit as important as literacy in creating better citizens. Sitting in a city council meeting, a jury box or in front of a television, citizens are bombarded with numbers: inflation rates, pollutant levels, environmental risks and polling data. To understand fully the debate, weigh the soundness of policy arguments and not be completely swayed by anecdote and prejudice, they must be able to comprehend numbers.

In the report *Mathematics and Democracy: The Case for Quantitative Literacy* the National Council on Education and the Disciplines lists a dozen examples in which numeracy is important to citizenship.⁸ Some of them are:

- *Understanding how different voting procedures (e.g., runoff, approval, plurality, preferential) can influence the results of elections*
- *Understanding comparative magnitudes of risk and the significance of very small numbers (e.g., 10 ppm or 250 ppb)*
- *Understanding that unusual events (such as cancer clusters) can easily occur by chance alone*
- *Understanding the difference between rates and changes in rates, for example, a decline in prices compared with a decline in the rate of growth of prices*

⁷ Eric Rauchway (2001) “In bondage to historical false memory,” *Financial Times*, August 21, p. 13.

⁸ www.woodrow.org/nced/mathematics_democracy.html

EMBARGOED UNTIL APRIL 17, 2002

- *Understanding quantitative arguments made in voter information pamphlets*
- *Understanding student test results given in percentages and percentiles.*

Finally, we look at how performance is affected by student characteristics. We used regression analysis to search for any link between factors such as students' school, sex, discipline, grade-point average (GPA) and national or state origin and their performance on the test. The results are given in Table 6. We find that students from ASU and NAU performed worse on the survey than students at the University of Arizona. In the ranking of universities published by *U.S. News and World Report*, the University of Arizona is in the second tier, ASU in the third tier and NAU in the fourth. Hence our results both among Arizona's universities and between the state universities and the elite schools, confirm a relationship between quality of the university and student knowledge. We also find students with higher GPAs and males tended to score higher than average. A student's discipline had no effect, except for business students who tended to score lower on the survey.

Arizona natives did no differently from non-natives. Hence we find no evidence to support the notion that attracting students from other states contributes academically to our schools or helps improve Arizona's stock of human capital. Foreign students performed worse than non-foreign students on our survey. Some may argue that it is unfair and unnecessary to expect non-U.S. students to do well on our survey. However, foreign students should obtain more from their stay in the United States than a profession.

EMBARGOED UNTIL APRIL 17, 2002

Having foreign students learn about the history and culture of their host country contributes in a small way to international understanding and goodwill.

Table 6. Factors Affecting Survey Performance		
Variable	Coefficient	T-stat
ASU	-.0449829	-2.01**
NAU	-.0528451	-1.71*
GPA	.0540818	4.62**
Male	.0635009	3.04**
Foreign	-.0906542	-1.91*
Native	-.0004087	-0.01
Business	-.0475028	-1.96*
Engineering	.0075949	0.18
Education	-.0601885	-1.26
Arts	-.0102906	-0.17
Science	-.0190284	-0.54
Constant	.3342685	6.55
Number of obs. = 162		Adj. R-squared = 0.1500
Root MSE = .12434		*Significant at 90% level
		** Significant at 95% level

These results to some extent may be driven by performance in specific subject areas. When examining how well students did by subject area, we found that males only did significantly better in science and geography. Foreign students did worse in American history. This may indicate that whatever history students do know is only an echo from their high school. The only factor that has a consistently significant effect across subject areas is GPA, which has a positive effect in the areas of art, quantitative analysis and literature.

Conclusions and Recommendations

Public support for higher education is redistribution toward the upper echelon of society. (Even now only 44 percent of high school graduates go on to a four-year university, and 33 percent will receive a degree.)⁹ Taxing the many for the benefit of the

⁹ Organization for Economic Cooperation and Development (2000) *Education at a Glance*, pp. 157, 173.

EMBARGOED UNTIL APRIL 17, 2002

few can only be justified if there are spillovers from higher education that benefit society as a whole.

One possible effect is that the more educated are more knowledgeable, effective citizens. If so, then Arizona taxpayers are not getting their money's worth from their state's universities—and we expect the same is true in most other states. We found that Arizona's institutions of higher learning are failing to inculcate into their graduates a well-rounded base of commonly shared knowledge and reasoning skills. Students earned passing marks in only four areas: civics, literature, computer literacy and pop culture. They scored worse in the most vital areas for an informed citizenry: American history and quantitative methods.

This failure is not entirely one of depth or inability to learn by students. Every category had at least one perfect score. Rather, the failure is one of breadth. As the Arizona Association of Scholars found, there is no requirement that graduates obtain a well-rounded education. Even at the undergraduate level, our universities are glorified professional schools where each student leaves knowing the lingo of his or her chosen field, but having little shared culture with educated society as a whole.

If that indeed is what we want higher education to be, then there is little reason for public support. The returns to individuals from college education are high enough that students can support their own professional education without having to rely on taxpayers. On the other hand, if there are public benefits to education, we should insist that the universities, especially those supported by public funds, provide them.

EMBARGOED UNTIL APRIL 17, 2002

To ensure that every student graduates from our public universities with the shared, fundamental knowledge necessary to make them good citizens as well as productive workers, schools should implement the following reforms.

- Students should be required to complete a core curriculum in history, literature, the fine arts and the social and natural sciences before graduating.
- Students should be required to take courses in American history. If the purpose of our universities is truly to apply social cement, clearly graduates must be familiar with the history of our nation.
- Students should be required to take courses in college-level mathematics including calculus and statistics. At ASU the math requirement may be met with classes in dance and computer art, or math classes that are largely remedial in nature.
- The core curricula should consist of survey courses in the required topics. Presently, students can fulfill core requirements with classes that are near parodies of specialization within the modern university.
- Requirements should be enforced by having students pass minimal competency tests in order to graduate. The tests should cover six fields: mathematics, history, the physical and social sciences, and the language and fine arts. To ensure that universities fulfill their mission to instill fundamental, shared knowledge, the Board of Regents should oversee the creation and administration of an exam that tests basic knowledge in the core fields. Funding levels for the universities might be made dependant on their students' performance on the test.

EMBARGOED UNTIL APRIL 17, 2002

- The Legislature should consider allowing private entities to establish liberal arts colleges under charters very much like those used in K-12. These "Charter Colleges" would be accountable in much the same way that charter schools are accountable and the students would be subject to the same basic knowledge tests as we suggest for their counterparts in traditional public universities. These specialized charter colleges are likely to be more responsive to legislative mandates concerning liberal arts education than the public universities since their very existence would depend on their ability to impart a liberal education to their students.

These recommendations will not be popular in the academy, both among students and professors. They will also remind many of the unpleasantness surrounding the implementation of the AIMS test. Indeed, the issue is the same: how can taxpayers be assured that they are getting their money's worth from the public education system? In higher education, as in the lower grades, the issue of accountability is tied up in the question of what we should expect from our schools in the first place. In the case of our universities, if the mission is professional training or technical spillovers, there are more efficient ways to achieve it. If our universities' mission is, as they say at Harvard, to initiate students into "the company of educated men and women," then more work needs to be done.

EMBARGOED UNTIL APRIL 17, 2002

Appendix: Survey of Arizona College Seniors

*Correct answers marked with *.*

Source

- 1 Who was the father of the U.S. Constitution? *Elite College History Survey*
 - a. George Washington
 - b. Thomas Jefferson
 - c. Benjamin Franklin
 - *d. James Madison

- 2 What is the capital of Vietnam? *Authors*
 - a. Bangkok
 - b. Saigon
 - c. Ho Chi Minh City
 - *d. Hanoi

- 3 A line passes through (-4,4) and (4,-6). What is the slope of this line? *Authors*
 - *a. -5/4
 - b. -1
 - c. -4/5
 - d. 4/5

- 4 What was the source of the following phrase: "Government of the people, by the people, for the people?" *Elite College History Survey*
 - a. The speech: "I have a Dream"
 - b. Declaration of Independence
 - c. U.S. Constitution
 - *d. Gettysburg Address

- 5 An object has a positive electric charge whenever: *CLEP 2001 Study Guide*
 - a. It contains an excess of electrons.
 - *b. It contains a deficiency of electrons.
 - c. The nuclei of its atoms are positively charged.
 - d. The electrons of its atoms are positively charged.

- 6 Where is the Suez Canal? *Cultural Literacy Test*
 - a. India
 - *b. Egypt
 - c. Panama
 - d. China

- 7 Identify Snoop Doggy Dogg. *Elite College History Survey*
 - *a. A rap singer
 - b. Cartoon by Charles Schulz
 - c. A mystery series
 - d. A jazz pianist

EMBARGOED UNTIL APRIL 17, 2002

- 8 In what year did the Civil War end? *Dartmouth Review 1990*
a. 1864
*b. 1865
c. 1863
d. 1866
- 9 What did the scarlet "A" stand for on Hester Prynne's *Mindfun.com* dress?
a. Accused
*b. Adultery
c. Amish
d. Agnostic
- 10 If you have 1 pair of red and 1 pair of blue socks in your drawer, what is your chance of getting a matching pair if you draw 2 socks at random? *CLEP 2001 Study Guide*
a. $\frac{2}{3}$
b. $\frac{1}{2}$
c. $\frac{1}{4}$
*d. $\frac{1}{3}$
- 11 Who wrote the *1812 Overture*? *Dartmouth Review 1986*
a. Mozart
b. Beethoven
c. Bach
*d. Tchaikovsky
- 12 Which of the following is physically possible: *Authors*
a. A spaceship flying faster than the speed of light
b. A perpetual motion machine
c. Hearing an explosion on the Moon
*d. Carbon spontaneously turning into nitrogen
- 13 When students in "Dead Poets Society" stood on their *Mindfun.com* desks and said "Oh Captain, my Captain", they were quoting what American poet?
*a. Walt Whitman
b. Robert Frost
c. Carl Sandburg
d. E.E. Cummings
- 14 The opening of diplomatic relations between the United States and China's communist government occurred during the presidential administration of *NAEP History 1994*
a. Harry S. Truman
b. John F. Kennedy
c. Lyndon B. Johnson
*d. Richard M. Nixon

EMBARGOED UNTIL APRIL 17, 2002

- 15 Who painted *Guernica*? *Authors*
- a. Renoir
 - b. da Vinci
 - c. Giotto
 - *d. Picasso
- 16 When you try to open a file on your computer you get a message saying there has been a sharing violation. The most likely cause is that the file: *Foreign Service Exam Study Guide*
- *a. Is currently being used by another user.
 - b. Belongs to another user.
 - c. Is a read-only file.
 - d. Cannot be found by the operating system.
- 17 A certain company keeps a list of 50 employees and their annual salaries. When the salary of the very highly paid president is added to this list, which of the following statistics is most likely to be approximately the same or nearly the same for the original list and the new list? *NAEP Math, Grade 12, 1992*
- a. The highest salary
 - b. The range
 - c. The mean
 - *d. The median
- 18 What are the four basic forces in the universe? *Dartmouth Review 1990*
- *a. Gravity, electromagnetism, strong nuclear force, weak nuclear force
 - b. Gravity, electromagnetism, chemical force, atomic force
 - c. Gravity, centrifugal force, centripetal force, Coriolis force
 - d. Gravity, electromagnetism, thermodynamic force, quantum force
- 19 John Tyler, James Buchanan, William H. Harrison, Millard Fillmore, and James Abram Garfield were all: *CLEP 2001 Study Guide*
- a. House speakers
 - *b. United States presidents
 - c. Newspaper publishers
 - d. New York City mayors
- 20 In classical mythology, who performed the twelve great labors? *CLEP 2001 Study Guide*
- a. Achilles
 - b. Oedipus
 - c. Theseus
 - *d. Hercules

EMBARGOED UNTIL APRIL 17, 2002

- 21 What are the three basic economic problems that every economy must solve? *Foreign Service Exam Study Guide*
- a. What to produce, where to produce, for whom to produce
 - *b. What to produce, how to produce, for whom to produce
 - c. Whether to produce, where to produce, why to produce
 - d. Why to produce, how to produce, which to produce
- 22 Chains of amino acids that are fundamental components of all living organisms are: *Authors*
- *a. Proteins
 - b. Carbohydrates
 - c. Minerals
 - d. Elements
- 23 The term "Reconstruction" refers to: *Elite College History Survey*
- a. Payment of European countries' debts to the United States after the First World War
 - b. Repairing of the physical damage caused by the Civil War
 - *c. Readmission of the Confederate states and the protection of the rights of Black citizens
 - d. Rebuilding of the transcontinental railroad and the canal system
- 24 Plato was a pupil of: *CLEP 2001 Study Guide*
- a. Aristophanes
 - *b. Socrates
 - c. Crito
 - d. Aristotle
- 25 In the American political system, "separation of powers" means: *CLEP 2001 Study Guide*
- *a. The division of governmental functions into three distinct branches, namely executive, legislative, and judicial.
 - b. The division of church, state, and press.
 - c. The division of political power in the hands of the president, the Senate, and the House of Representatives.
 - d. The army, navy, and the air force.
- 26 If $x-4 = 4(1-x)$, then what is the value of x ? *Authors*
- a. 0.80
 - b. 0.63
 - *c. 1.60
 - d. 4.0
- 27 The property of light waves that leads to the phenomenon of color is their: *CLEP 2001 Study Guide*
- a. Amplitude
 - b. Velocity
 - *c. Wavelength
 - d. Intensity

EMBARGOED UNTIL APRIL 17, 2002

- 28 The Monroe Doctrine declared that: *Elite College History Survey*
- a. The American blockade of Cuba was in accord with international law
 - *b. Europe should not acquire new territories in the Western Hemisphere
 - c. Trade with China should be open to all Western nations
 - d. The annexation of the Philippines was legitimate
- 29 A gifted composer whose operas include *The Marriage of Figaro* and *The Magic Flute* was: *CLEP 2001 Study Guide*
- a. Antonin Dvorak
 - b. Gustav Mahler
 - c. George Gershwin
 - *d. Wolfgang Amadeus Mozart
- 30 In what modern nation was the Boer War fought? *Dartmouth Review 1990*
- *a. South Africa
 - b. India
 - c. Cuba
 - d. Egypt
- 31 Which of the following is not guaranteed by the First Amendment to the U.S. Constitution? *Cultural Literacy Test*
- a. The right to the free exercise of religion
 - b. The right to assemble peacefully
 - c. The right to free speech
 - *d. The right to a trial by jury
- 32 It is a common practice of regular e-mail users to have some specific text automatically appear at the end of their sent messages. This text is referred to as their: *Foreign Service Exam Study Guide*
- a. Attachment.
 - b. Subject.
 - *c. Signature.
 - d. Protocol.
- 33 Who invented calculus? *Dartmouth Review 1990*
- *a. Isaac Newton
 - b. Carl Friedrich Gauss
 - c. Galileo Galilei
 - d. Christian Huygens
- 34 Renoir and Monet belong to which school of art? *Dartmouth Review 1986*
- a. Surrealism
 - b. Abstractionism
 - *c. Impressionism
 - d. Realism

EMBARGOED UNTIL APRIL 17, 2002

- 35 There are 93 students in the class; 42 like math, while *CLEP 2001 Study Guide* 41 like English. If 30 students don't like either subject, how many students like both?
- a. 10
 - *b. 20
 - c. 41
 - d. The answer cannot be determined from the data given
- 36 What is the Magna Carta? *Elite College History Survey*
- *a. The foundation of the British parliamentary system
 - b. The Great Seal of the monarchs of England
 - c. The French Declaration of the Rights of Man
 - d. The charter signed by the Pilgrims on the Mayflower
- 37 The phrase, "...from each according to his ability, to each according to his need..." is attributed to which author? *Marianne Jennings*
- a. Thomas Jefferson
 - *b. Karl Marx
 - c. Franklin Roosevelt
 - d. Adam Smith
- 38 Which Swiss psychologist wrote on the collective unconscious? *Dartmouth Review 1990*
- *a. Carl Gustav Jung
 - b. Sigmund Freud
 - c. Gottfried Wilhem von Leibniz
 - d. Christian von Ehrenfels
- 39 Who is the author of *Crime and Punishment*? *Marianne Jennings*
- a. Solzenitsyn
 - b. Pasternak
 - *c. Dostoyevsky
 - d. Tolstoy
- 40 In an attempt to restrain the president's ability to unilaterally commit the U.S. forces to action, Congress in 1973 passed the: *Foreign Service Exam Study Guide*
- *a. War Powers Resolution
 - b. National Emergencies Act
 - c. International Crisis Response Act
 - d. Foreign Military Commitments Resolution