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# Special Report



Washington Research Council

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## The Economic Value of Higher Education

Last year Gov. Gary Locke's 2020 Commission on the Future of Post-Secondary Education observed that higher education will become all the more important with the advent of a knowledge-based global economy. The Commission called for the state to increase access to higher education.

That will cost money. As it is, higher education consumes 10 percent of the state's budget. The legislature likely will feel hard pressed to increase funding beyond this level.

Even so, some will argue that the state should increase student educational grants and tuition subsidies. For without aid, potential students may decide college education is financially too risky. They may doubt that their future earnings will suffice to pay off the debt they incur to attend college.

It's important for state lawmakers and potential students to consider what research and economic theory have to say about the worth of higher education, its costs and who should bear them.

*Education increases state and national wealth.*

Between 1929 and 1998, the per capita output of the national economy grew by 240 percent. An increasingly educated workforce often is credited for most of this growth.

Economist Edward Denison, in his path-breaking study of the sources of growth, estimates that one quarter of the increase in output between 1929 and 1969 is attributable to increases in American levels of educational attainment.

### Briefly

Research shows that higher education can add significantly to the subsequent earnings of some students. Returns vary, however, with such factors as family background, innate ability, and the program of study pursued.

Occupational projections indicate that for the foreseeable future the majority of jobs will not require higher education. Additionally, in recent years the number of college educated individuals working in jobs that do not require education beyond high school has increased.

The evidence shows that many of these college-educated workers lack the literacy skills traditionally associated with holding a college degree.

*"During the next century, higher education will become increasingly important for landing high-paying jobs."*

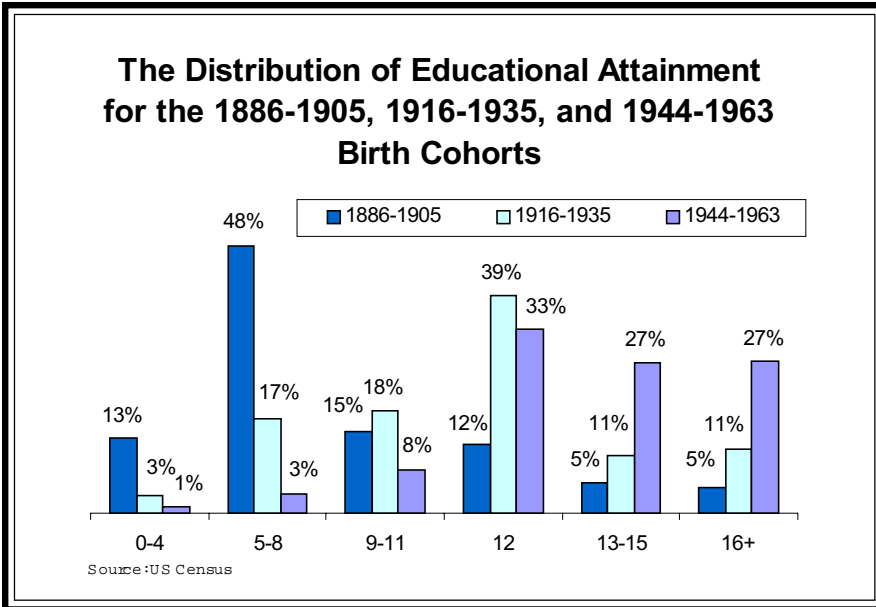


CHART 1

U.S. educational attainment has increased dramatically during the 20<sup>th</sup> century.

Chart 1 shows the distribution of the highest grade of schooling completed for the birth cohorts 1886-1905, 1916-1935 and 1944-1963.

Most people born between 1886 and 1905 did not attend school beyond the 8<sup>th</sup> grade. Only 22 percent graduated from high school, and only 10 percent went on to college.

People born between 1916 and 1935 were much more likely to attend high school. Fully 61 percent graduated, and 22 percent went on to college, though many later dropped out.

The majority of people born between 1944 and 1963 not only graduated from high school but attended college as well: 87 percent finished high school, and 27 percent college.

It's worth noting that overall, America leads the world in educational attainment, just as it leads all but tiny Luxembourg in national income per capita. But other industrialized countries are catching up, according to data collected by the Organization for Economic Cooperation and Development.

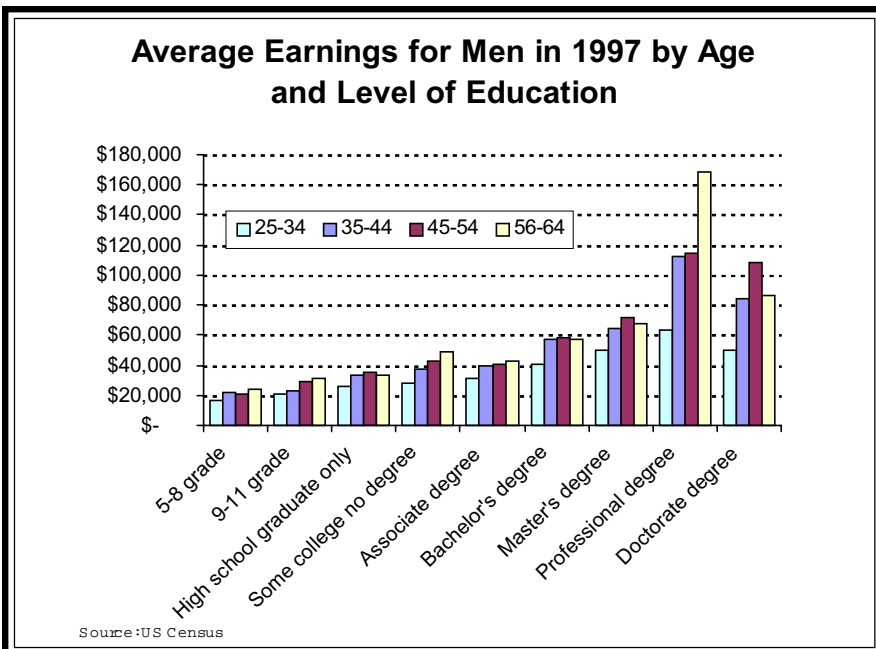
Five countries now slightly exceed America in the percentage of 25-34 year olds who have completed secondary school: Norway, South Korea, Poland, Sweden and the Czech Republic.

Workers with more education tend to make more money. So do older workers.

Charts 2 and 3 show the average earnings of men and women in 1997 by levels of education and age, as reported by the U.S. Census Bureau. (Note, these averages include people who worked part-time and only part of the year, so they understate earnings of full-time workers.)

Earnings increase with the level of education (though people with doctoral degrees have lower average earnings than those with

CHART 2



professional degrees). For instance, the average earnings of male high school graduates age 45-54 was \$35,407, while those with a bachelor's degree was \$58,509 – a 65 percent difference.

The “rate of return to education” is what analysts call the percentage increase in annual earnings associated with each additional year of schooling. The 65 percent earnings increase that men age 45-54 accrued for their four years of college education amounted to a 13 percent compounded average rate of return.

Besides education, earnings also tend to increase with age. The average earnings for 45-54 year old men with bachelors degrees was 43 percent greater than bachelor degree holders age 24-35.

In some cases, there was a fall-off in the average earnings going from ages 45-54 to 55-64. But this reflected the reduction in the percentage of people working full-time.

Women earn less than men do, but otherwise the pattern holds. For women age 45-54, college graduates earned 68 percent more than high school graduates.

Not everyone agrees that education causes earnings to increase.

They observe that simple correlation between education and earnings does not prove that education causes higher earnings.

People attending college tend to be more motivated and talented. They learned more in high school. Since these factors also tend to push up earnings, raw comparisons by level of education may overstate the financial effect of education alone.

The 65 percent earnings premium enjoyed by 45-54 year old college educated males may well be a product of ability as well as education.

Further, some theorists have questioned the financial effect of education by suggesting that college degrees are merely a device employers use to sort out potential employees. In their view, employers place no fundamental value on education. Rather, they recognize the higher levels of education indicate higher ability. Accordingly, they look for workers with college degrees and pay them more because of their presumed ability, not because of their education as such.

The best estimates, however, indicate that differences in ability account for only a small share of the premium paid to educated workers.

Economists have employed statistical techniques in an effort to disentangle the several factors that may influence earnings. In a recent

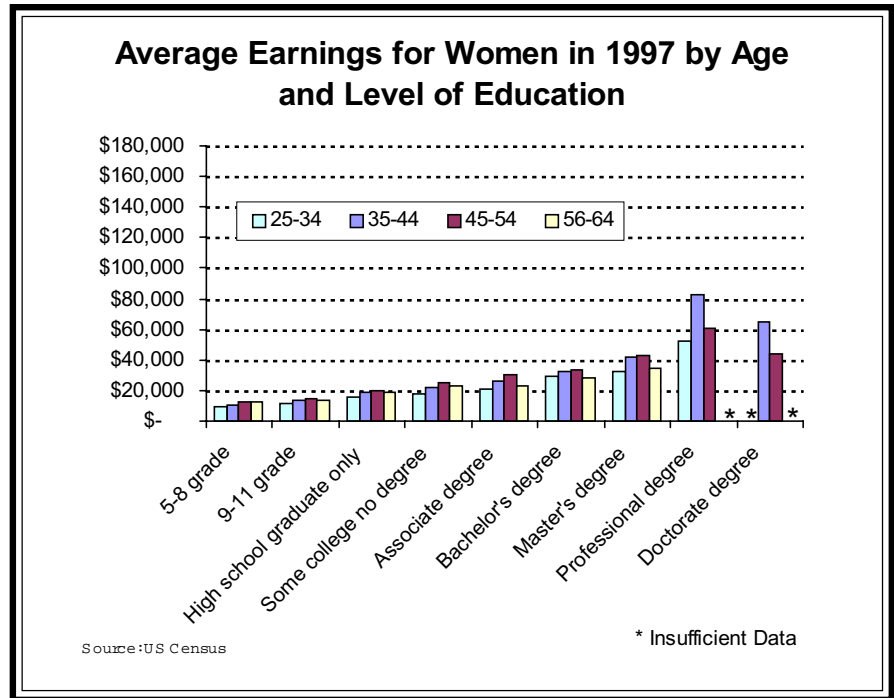


CHART 3

*“The ‘rate of return to education’ is what analysts call the percentage increase in annual earnings associated with each additional year of schooling.”*

*“Expectations to the contrary, the earnings premium enjoyed by college graduates has increased significantly since 1980.”*

survey of the literature, David Card, at the University of California at Berkeley, concludes that the ability-bias factor is not large. His conclusion agrees with earlier surveys by Gary Becker and Zvi Griliches.

On the basis of studies relating the differences in earnings of identical twins, Card estimates the ability bias at about 10 percent.

Also of interest is that the studies Card cites found rates of return to education ranging from 2 percent to 15 percent, with the majority grouped between 6 percent and 11 percent. In part, this variation results from the use of different statistical techniques. But, according to Card, the key conclusion is that the rate of return to education is not a constant. Rather, it varies “with other characteristics of individuals such as family background, ability or level of schooling.”

The evidence suggests that rates of return are higher for students graduating from higher quality schools, born to highly educated parents, and measured to have higher ability.

Expectations to the contrary, the earnings premium enjoyed by college graduates has increased significantly since 1980.

Analysts once predicted that the increasing supply of college graduates would narrow the earnings difference between college and high school graduates.

Between 1960 and 1970, college enrollment exploded from 3.6 million to 8 million, as the baby boom increased the college-age population and the percentage of high school graduates going on to college. Throughout the 1970s, the college-graduate premium fell, consistent with simple supply-and-demand theory.

But around 1980, the trend reversed. The college premium began to grow.

This occurred even though wages were stagnant. So some observers concluded that the real story was not one of an increasing value of college education, but of a decreasing value of high school graduates in the labor market.

The currently rising college premium suggests a shortage of college-educated workers. The governor’s 2020 Commission predicts the demand for such workers will continue to grow during the coming years, with “the advent of a knowledge-based economy in which good jobs require higher levels of skill and knowledge than ever before.”

However, detailed projections by occupation prepared by the U.S. Department of Labor do not show much relative growth in demand for highly educated workers.

So why is the college premium so high?

Economists Frederic Pryor and David Schaffer have provided an explanation. They observe that most analyses tend to treat the college-educated as a homogeneous population, whereas in reality graduates vary greatly in capabilities. Many college graduates end up working in jobs requiring only a high school education because they are not as functionally literate as college grads holding down jobs requiring a true college education. So the

supply of well-educated college grads is smaller than one might believe. Hence their earnings premium is higher than would be expected.

Though higher education is linked to higher earnings, occupational projections show that many jobs will be available for workers with no college education.

The state Department of Employment Security annually prepares 10-year projections of job growth in Washington by occupations. The most recent cover the period between 1996 and 2006.

The department projects that the total number of jobs will increase by 21 percent, to 3.2 million, by 2006.

The department classifies jobs by the amount of training required. Chart 4 breaks down year-2006 jobs accordingly.

Although most jobs will require some form of training, in most instances employers will provide it in on the job. Only one-third will require formal post-secondary schooling, and less than one-fourth a bachelors degree or more.

Projected job openings are shown in Chart 5. Only one-third will require education beyond high school, and only one-third a bachelors degree or more.

New jobs will account for less than half of job openings. Most openings will result from workers exiting the labor market.

It's widely believed that the "new economy" will require increasingly higher levels of education. And indeed, the new jobs will require more: 30 percent will require at least a bachelors degree, and 8 percent an

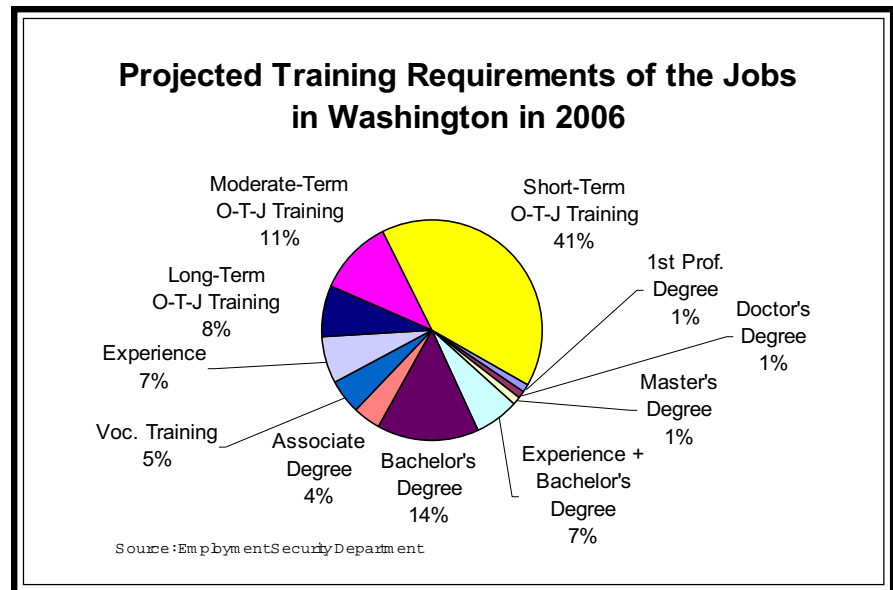


CHART 4

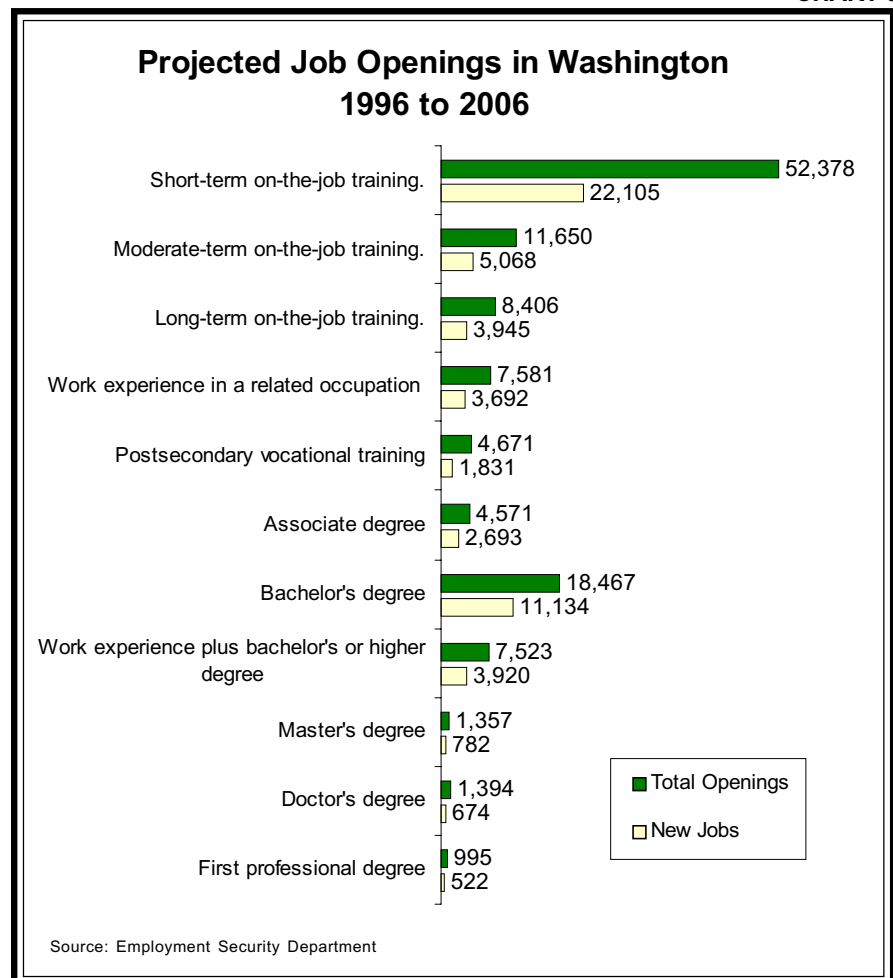


CHART 5

associate degree or vocational training. Openings tied to replacing retiring workers, however, will require much less education.

*Investment in education creates human capital.*

From an economic point of view, education is an individual and social investment that yields returns in future years. The returns may be financial, such as higher wages and tax revenue, or non-financial, such as a richer life experience.

Economists interpret the higher earnings of more educated and older workers as returns on their education and experience. Education and experience are goods that create other goods, and therefore are a form of capital that economists refer to as “human capital.”

University of Chicago economist and Nobel laureate Gary Becker has advanced the theory of human capital. He once wrote that most people think of capital as a bank account, corporate stock or steel plants. “These are all forms of capital in the sense that they yield income and other useful outputs over long periods of time,” he said.

*“Education and experience are goods that create other goods, and therefore are a form of capital that economists refer to as ‘human capital.’”*

But there’s another form of capital with which people generally are unfamiliar, Becker said. “Schooling, a computer training course, expenditures on medical care, and lectures on the virtues of punctuality and honesty are capital too in the sense that they improve health, raise earnings, or add to a person’s appreciation of literature over much of his or her lifetime. Consequently, it is fully consistent with the capital concept as traditionally defined to say that expenditures on education, training, medical care, etc., are investments in capital. However, these produce human, not physical or financial, capital because you cannot separate a person from his or her knowledge, skills, health, or values the way it is possible to move physical or financial assets while the owner stays put.”

Economists generally explain the pattern of rising earnings with age by observing that work experience of itself makes people more productive. Experience is a form of human capital.

*Creating educational human capital costs money.*

Students typically bear three costs when investing in education: out-of-pocket costs for tuition, books and supplies; earnings foregone while attending school; and foregone earnings to lost work experience.

Because human capital is intangible, its creation has implications for the financing of education. Lenders cannot secure educational loans with claims on human capital. This makes them reluctant to finance investments in education unless borrowers can put up physical assets as security. Such reluctance is offered as a justification for government guarantees of student loans.

Another justification for student financial aid stems from reluctance potential students may feel to apply for loans in the first place. In borrowing to invest in higher education, students risk that their future earnings, though boosted by more education, will not suffice to pay off the loans. To induce students to invest, governments offer grants, means-tested financial aid and tuition subsidies.

Future returns to education depend on what students choose to study.

As Chart 6 shows, salary offers vary considerably, depending on student fields of concentration. For instance, the average salary offers reported for computer science and computer engineering are 65 percent above those for letters, which includes English.

Salary-offer variation clearly indicates that employers value the skills of some academic majors much more than others. Though some of the variation in salary offers probably reflects the varying innate abilities of students majoring in computers and English, the larger part surely exists because employers want graduates with computer skills.

Even so, access to such high-yielding majors as computer science is severely rationed on state campuses. Well-qualified students are turned away. State colleges and universities have yet to respond adequately to this problem.

**Conclusions**

Research has found that higher education is associated with substantial earnings premiums in the job market. The rate of return on education, however, varies with such factors as family background and innate ability.

During the next century, higher education will become increasingly important for landing high-paying jobs. But for the foreseeable future, many jobs will require no formal schooling beyond high school.

Returns vary greatly across programs of study. Unfortunately, such programs as computer science and computer engineering often turn away many highly qualified applicants – applicants whose skills upon graduation are greatly demanded and compensated. The state should expand access to these programs. In instances where the programs are particularly expensive for the schools to offer, it is appropriate to charge students higher tuition.

Students of ability from economically disadvantaged backgrounds might decline to invest in higher education because of financial risk. The state should give such students grants and tuition subsidies.

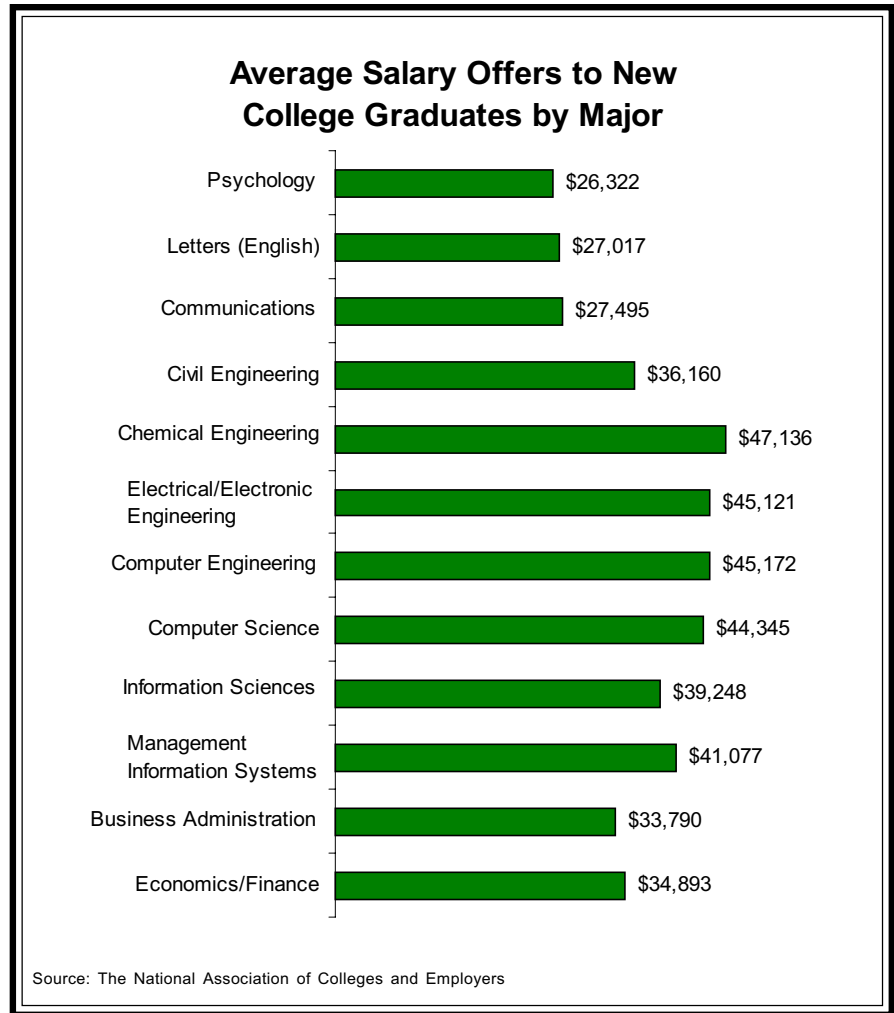


CHART 6

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