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EDUCATION AND ECONOMIC GROWTH

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Historically, many economists have held that economic growth is primarily a matter of amassing more tangible capital. They have treated education as a "consumer good." In recent years, however, growing recognition has been given to the fact that education is an investment industry—that the development of people is as important as the development of things and that growth may be fostered by the development of human talent.

HUMAN ELEMENT IN GROWTH

Theodore Schultz has been one of the most fervent proponents of the need to recognize the value of the human element in economic development. He has said, "The main stream of modern economics has by-passed any systematic analysis of human wealth" [1]. Harold Groves also indicates many have ignored or at least underrated technology as an economic factor. He points out that Mills, Malthus, and Ricardo stressed capital savings and natural resources as the principal factors in development. They "viewed the expansibility of population as the curse that would prevent any ultimate gains from innovation seeping through to the common man" [2].

Many years ago, Robert Owen observed:

Mr. Malthus is correct when he says that population of the world is ever adapting itself to the quantity of food raised for its support; but he has not told us how much more food an intelligent and industrious people will create from the same soil than will be produced by one that is ignorant and ill-governed. It is, however, as one to infinity [3].

In countries where considerable investment has been made in education and other elements of the human factor, advancing technology has played a major role in keeping the dire predictions of Malthus from materializing. Where such investments have not been made, his theory appears to have considerable validity.

Education serves several important functions in stimulating economic growth. It provides the basis for the dissemination of knowledge, the acquisition of skills, and the continued development of new knowledge. All of this, in turn, contributes to increasing the productivity of labor, improving the efficiency with which capital

is used, and the discovery and development of new resources. What is the relationship between education and economic growth?

EDUCATION AND INCOME LEVEL

Analyses by the Bureau of the Census of the Department of Commerce have shown a direct relationship between education and income levels (Table 1).

TABLE 1. INCOME OF AMERICAN MALES AS AFFECTED BY
EDUCATIONAL LEVEL (1958) [4]

Years of School Completed	Average Annual Income for Males 45-54 Years of Age	Estimated Lifetime Income from Age 18 till Death
Elementary		
Less than eight years	\$ 3,008	\$129,764
Eight years	4,337	181,695
High School		
One to three years	4,864	211,193
Four years	6,295	257,557
College		
One to three years	8,682	315,504
Four years or more	12,269	435,242

These data reflect the very high return to the individual from investments in education. For example, in 1958 a young man completing the eighth grade could have expected an increase in lifetime earnings of some \$76,000 by finishing four years of high school. This amounts to some \$19,000 added income for each additional year spent in high school. Furthermore, a young man finishing high school in 1958 could have expected an increased lifetime income of some \$178,000 upon completion of four years or more of college. This represents a total return of approximately \$40,000 additional income for each year he would spend in college (assuming an average of 4.5 years of college training).

RETURNS ON INVESTMENT

Gary Becker [5] has measured the economic value of education by relating the increased lifetime earnings of college graduates to the total investment, both public and private, in the education of these people. This investment includes the student's sacrifice of earnings while in school (almost half of the total amount) and the cost to him and the college, regardless of the source of funds for providing his education. The increased earnings of urban white males, for example, provided a return on investment in education of about 9 percent. By comparison, the estimated earnings on investments in manufacturing was about 7 percent after taxes, and more

than 12 percent before taxes. For all corporations the range was from 10 to 13 percent before taxes, and for unincorporated businesses, from 5 to 8 percent.

Schultz [6] has estimated far greater returns from an investment in elementary and secondary education. He has suggested that for a 10 percent increase in investment at each level of schooling in the South, the anticipated rate of return would probably exceed 30 percent annually in the first eight grades, more than 15 percent in high school, and perhaps better than 12 percent annually for higher education.

Jacob Mincer [7] points out that the rate of return on selected investments in on-the-job training is not greatly different from the rate of return on investments in college education, where both are unadjusted for ability factors.

Factors other than education, *per se*, may have contributed to the greater earnings of those attaining higher levels of education. However, studies concerned with noneducation variables affecting income show an increase in income from college training even after adjustments were made for: (1) level of high school class rank, (2) intelligence test scores, and (3) father's occupation. At least part of the additional earnings of those receiving higher levels of education are the direct result of the education [8].

EDUCATION'S CONTRIBUTION TO GROWTH

In terms of economic growth, E. F. Dennison [9] concluded that education has been a larger source of growth than the increase in stock of material capital. He suggested that about 23 percent of the growth of the U. S. economy between 1929 and 1957 was associated with an increase in education of the labor force.

In attempting to assess the contributions of education to economic growth, Schultz [10] points out that the unexplained increase in the U. S. national income amounts to nearly 60 percent of the total between 1929 and 1956. He suggests that between 30 and 50 percent of the total growth in the economy might be attributed to education of the labor force. He believes that between 36 and 70 percent of the hitherto unexplained rise in earnings of labor can be explained by the additional education of workers.

Many other efforts have been made to relate education and economic growth. For example, J. K. Norton [11] compared the per capita income level in numerous countries with the level of natural resources and the level of educational development. He

found a high positive correlation between educational development and per capita income irrespective of the level of natural resources.

Although many of the economic analyses of returns from education have focused upon the contributions to the individual's earning capacity, we do not mean to suggest that this represents the total picture. Burton Weisbrod suggests that recognition should be given not only to the effect of education on incremental earnings but also to its external effects. For example:

Schooling benefits many persons other than the student. It benefits the student's future children who will receive informal education at home; it benefits neighbors who may be affected favorably by the social values developed in children. Schooling benefits employers seeking a trained labor force; and it benefits society at large by developing the basis for an informed electorate [12].

The non-economic returns from education are unquestionably of great magnitude, with benefits accruing to all of society—not merely to the individuals engaging in educational endeavors.

Having established what I consider to be a firm basis for the relationship between education and economic growth, let us now look more specifically at our current educational programs. To what extent can these programs remove inadequate education as a serious obstacle to further economic growth?

EDUCATIONAL NEEDS IN THE SIXTIES

I assume that every decade has had a "crisis in education." I recall several such crises in my lifetime. However, I am sure that as a nation we have never been confronted with anything like the magnitude of the educational problem now before us.

For example, our nation's colleges and universities are expected to be faced with a demand for more than doubling their enrollment in the next eight years. These institutions are already experiencing great difficulty in providing facilities and staff to accommodate the onrush of students. Normal population growth in the 1960's will require a one-third increase in the number of classroom teachers. Growth and replacement needs will demand some 20,000 new teachers annually during this ten-year period [13]. We are presently falling far short of meeting these needs.

During the decade of the fifties public expenditures for education more than doubled. The U. S. is expected to spend at least as much on public schools during this decade alone as was spent in the past 150 years. The educational needs of our young people are tremendous. For instance, of every 10 youngsters now in grade

school, 3 are not expected to finish high school and 8 will not finish college [14]. What does the future hold for the 30 percent of our youngsters who will not even receive a high school education—to say nothing about the additional 50 percent with a high school diploma but with little training or experience to enter the world of work?

CHANGES IN LABOR MARKET

The seriousness of this educational problem and its immediate relation to the further growth of the economy is obvious when we look at what is happening in the labor market.

Some 26 million new workers are expected to enter the labor market in the 1960's. This will be some 40 percent more than in the 1950's. In addition, a total of some 24 million jobs will be affected by automation and technological change during this decade [15]. Estimates are that some 34.5 million new jobs will be needed during the 1960's—compared with 21.8 million new jobs created in the 1950's.

What type of employee will be in most demand? Certainly the requirements for well-trained manpower will rise more rapidly than total manpower requirements. In the last decade, the number of professional and technical jobs rose about 50 percent, while total employment rose only about 15 percent [16]. Between 1952 and 1962, jobs filled by workers with less than a ninth grade education decreased 25 percent; those filled by workers with one to three years of post high school training increased 40 percent; and those filled by college graduates increased 54 percent. We can expect this trend to continue and perhaps become even more pronounced. Occupations requiring the most education and training will increase most rapidly, while those requiring semi-skilled or unskilled workers will either decline in number or barely change.

This employment trend offers little hope to many young people already out of work and many others entering the labor market. One of every three teen-age Negroes and one of every six teen-age whites are unemployed today. Among persons under 20 years of age, unemployment now is the highest since records have been kept.

What about the 7.5 million youngsters who will drop out of school before completing their high school education in the 1960's? Unless something is done to provide more help, a good percentage of these youngsters can be expected to swell the already large ranks of young and unskilled unemployed.

Some two years ago, James Conant [17] reported that in a slum

section, composed almost entirely of Negroes in one of our largest cities, 59 percent of the male youth between 16 and 21 were roaming the streets, out of school and unemployed. In another city, in an area of 125,000 people, mostly Negroes, roughly 70 percent of the girls and boys age 16 to 21 were unemployed. This is the "social dynamite" about which Conant warned us.

PROGRAMS OF VOCATIONAL EDUCATION

What is being done to resolve these problems? How are we to overcome these obstacles to further economic growth imposed by inadequate education?

Obviously these problems will require educational programs aimed at several different groups: (1) the unskilled and unemployed, including school dropouts, entering the labor market; (2) those displaced by automation and technological change and needing retraining in order to assume different responsibilities; (3) high school students expecting to enter the labor market upon graduation; (4) high school graduates in need of some additional technical or trades training to equip them to assume employment; and (5) those planning to complete a college education.

The first four groups—those constituting the major share of the total needing training—will be served primarily through various types of programs of vocational education. The critical need for greatly expanded programs in this area prompted President Kennedy in October 1961 to appoint a Panel of Consultants on Vocational Education, charged with the responsibility of "reviewing and evaluating the current national vocational education acts and making recommendations for improving and redirecting this program." The recommendations presented to the President last November have served as a basis for the administration's proposal to Congress for greatly accelerated efforts in vocational education [14]. The panel recommended that the 79 million dollar expenditure for vocational education and for training under the Manpower Development and Training Act and the Area Redevelopment Act in 1963 be increased to some 400 million dollars in fiscal 1963-64.

A bill in Congress based on the recommendations provides for a federal matching program for construction of facilities for area vocational schools, authorizes vocational education programs for persons in high schools, for dropouts from high school, for persons out of high school and available for full training, for the unemployed and the academically or socio-economically handicapped. In short, only degree credit college work was excluded.

With educational appropriations, the amount authorized is often

too little and too late to make the needed impact on the problem. The futility of such frugality is reflected in some statistics from Florida indicating that some \$550 per year is required to keep an individual in a secondary school offering vocational education, while \$1,800 per year is required to support a person on welfare, and \$2,400 a year in a correctional institution [18]. Furthermore, the loss of one year's income through unemployment is more than the total cost of twelve years of education through high school.

EXPANSION OF HIGHER EDUCATION

The rate at which we can expand staff and faculties and still maintain quality of educational programs has limits. The rate at which physical facilities can be enlarged also has limits. Nevertheless, some Herculean efforts are needed in higher education to meet the demands of the enormous crop of "war babies" expecting and needing to pursue a college education during the sixties.

Certainly this will demand large increases in expenditures for education. Five years ago less than 1 percent of the gross national product was expended for higher education. John Gardner [13] suggests that by 1970 higher education should be receiving approximately 1.9 percent of the gross national product.

IMPROVED EFFICIENCY

We must have improvements in curricula, in organization, in techniques, and in the efficiency with which all resources, including buildings, are used. We have hardly scratched the surface in developing and using television, which might greatly increase the efficiency of our total educational effort.

One of the keys to more effective and efficient public school education is further consolidation of school districts. Many say that a minimum enrollment of 2,000 is needed for an efficient school district. In 1957 more than 40,000 of the 53,000 school districts in the country had enrollments of less than 300. Gardner suggests that the total number of school districts should be reduced to about 10,000 by 1970 for most efficient operation [13].

We need to do a far better job of fitting our educational programs to the capabilities and interests of the individual. Our goal should always be to provide every individual the opportunity to obtain that education and training which is best suited to his needs and abilities and which can enable him to make the greatest contributions to society. More research might point the way to more effective means of guiding students into the types of educational experiences which can be most meaningful to them.

LEARNING, A LIFELONG PROCESS

While the formal educational system as we know it will have to provide the individual with more years of education, it obviously will account for a smaller proportion of his total lifetime learning in the future. The rate of obsolescence of knowledge and skills is so great that young people launching a career will, on the average, have to be trained for three occupations or professions in the span of their active work life. The well-educated youth of today may well be an obsolete man of tomorrow. Learning is a lifelong process, and our American system of education must become better geared to meet this need.

CONTRIBUTIONS BY LAND-GRANT INSTITUTIONS

I have said nothing specifically about opportunities for land-grant institutions to contribute to economic growth. These institutions can make the same contributions as other universities through regular instructional programs. However, the Cooperative Extension Service provides land-grant institutions a vehicle of proven effectiveness to carry out educational programs which are beyond the capabilities of most other institutions.

The contributions by Cooperative Extension to economic growth through its agricultural efforts are well documented. Extension has continuing opportunities for making very substantial contributions to economic growth through agriculture; indeed, our total efforts in agriculture must be further strengthened. However, land-grant universities have perhaps an even greater opportunity, yet virtually untapped, to make more of its educational resources, in addition to those in agriculture, available to the people of the state through some appropriate extension arm. I am not referring so much to formal course work as I am to the type of problem-centered, development-oriented, informal education which has characterized the efforts of Cooperative Extension for half a century.

In this connection I whole-heartedly agree with the following statement made by a committee of land-grant university presidents:

With the history of success (of the Cooperative Extension Service) in mind, we make a proposal of policy that the Extension idea be broadened and extended to include more of the university structure—perhaps all of it. The environment in which the university serves is such and the adult education needs of the nation are so great that it is logical to assign these greater responsibilities to the extension arm of the university. In the period ahead the nation will be better served if the land-grant system has an organized way to focus its intellectual resources on problems and needs of a developing society in a world setting.

Just how this is to be accomplished is a matter of decision for each university in accordance with what it considers appropriate . . . [19].

OPPORTUNITIES IN PUBLIC AFFAIRS EDUCATION

Finally, let me direct a few words specifically to you as leaders in public affairs education within the Extension Service. I do not know of any group which has the opportunity and capability of contributing more to helping remove some of the structural and institutional barriers to economic growth imposed by inadequate education. The key to removal of most of these barriers is enlightened public action.

Some of you have already done work in this area, and I applaud you for it. It merits your very best continued efforts. Indeed, I do not know of any single activity to which you as specialists in public affairs could more effectively and profitably direct your energies than trying to develop a public, better informed on the role of education in economic growth, and more keenly aware of the need for greater public support of educational efforts at all levels.

We know that most of our resources—capital, labor, etc.—which contribute to economic growth, are in some measure limited. But we have never yet really discovered the power and the potential of the human mind. As Charles Percy put it: “We can only cultivate it, train it, educate it in a continuing expansion of the one resource on which God has put no limit” [20].

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PART II

*Foreign Trade and Aid
Issues*

