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DIVIDENDS AND RESPONSIBILITIES OF EDUCATION BEYOND HIGH SCHOOL

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Mr. Chairman, ladies and gentlemen, during the last few weeks we have seen demonstrated in an unprecedented manner the significance to a nation and a world of the importance to the United States of having an educated adult population. This nation of educated, responsible people has shown its capacity to withstand the unanticipated loss of an esteemed President and still maintain its role as a leader of the free world. I doubt that such a shock could be withstood, without chaos, in any nation having a substantially lower level of education as a foundation for responsible individual behavior.

Yet it is increasingly evident that education is not able to grow as rapidly as the society it is to serve. The growing difficulty about the nation in obtaining adequate financial support to provide an education for increasing numbers, in the face of increasing costs per individual, can only lead to the conclusion that great and grave difficulties are ahead in public education.

This presentation will concentrate on the topic of adult education for those who have completed high school, recognizing this is not the complete scope of adult education needed in our society. Enrollment in the kindergarten through 12th grade will increase only 14% by 1970. College and university enrollment alone is expected to increase by 30-35% in the next three years. By 1970 college and university enrollment will have increased at least 51%, to a level of 7,000,000-- excluding vocational and continuing education. Construction of facilities for only



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the institutions of higher education will require \$2,300,000,000 per year. Yet adequate money to do the job does not appear forthcoming at the time it is needed.

But all of us are recommending immediate action to provide new opportunities for vocational education and continuing education beyond the high school for unprecedented numbers--in the millions of people--usually justified on the basis of retraining needs due to obsolescence induced by automation, providing opportunities for the "drop-outs" and combatting juvenile delinquency. This is on top of the about 25,000,000 currently engaged in adult education. This will require additional financial investment of great sums of money above that required by the colleges and universities. Yet the money does not seem readily available from public sources--and private sources cannot do the whole job.

Everyone seems to want to say, "We want more education for our children in order that they can have a better livelihood." But in the same breath is said, "Taxes are too high and tuition is too high." It is past time for you to change your philosophy: "Ask not what education can do for you--ask what you can do for education." You have a choice; you can finance education now, or finance welfare a few years from now.

Without vastly increased financial support for public and private universities, colleges, junior colleges and school districts sponsoring adult education, admission standards for education beyond high school will have to be raised drastically--curtailing educational opportunity to many rather than expanding it to provide for post-high school adult vocational training, adult continuing education and college and university education.

The educational task must be met or our nation's economy, standard of living and world leadership cannot indefinitely sustain itself.

In the remarks to follow will be discussed four basic responsibilities--what you can do for education, and two basic dividends--what education can do for

you. The four basic responsibilities are:

1. Everyone capable of completing high school, male and female, should participate in education or training beyond high school throughout their entire life.

2. Each individual should participate in the type of educational or training program suited to his individual ability and motivation.

3. Each individual is responsible for making it financially feasible for the younger people who follow to also pursue their education.

4. The nature of employment opportunity and the use of leisure time is rapidly changing--and each individual is responsible for preparing for change and participating in a manner which helps fulfill national goals.

The two basic dividends are:

1. Lifetime monetary and intangible personal income will increase in proportion to the level and continuance of educational achievement.

2. The state and nation are the primary beneficiaries of education--the individual is the secondary beneficiary.

Consider the first responsibility: "Everyone capable of completing high school, male and female, should participate in education or training beyond high school, throughout his entire life."

At the present time the population of the United States is about 190 million people. About 125 million are of post-high school age. Of this 125 million, about 23 million who hold at least a high school diploma are continuing their education or training. Of this 23 million, about 18.5 million are high school or college graduates who are pursuing some kind of adult education while about 4.5 million are enrolled in colleges and universities.

In addition there are some 6.5 million adults pursuing adult education who have not achieved a high school diploma.

These figures may leave the impression that adult education is helping all those who should participate. But note that about 95 million adult Americans are not currently involved in any formal adult education--yet it is a premise of this speaker that all adults should participate. Even if we assume nearly half of this 95 million are pursuing their education or training by self-study it still leaves some 50 million Americans or over 25% of the total population who are "sitting on their hands" and going backwards while the nation attempts to progress. Of course, some of this 50 million are the unemployed--unemployed in many cases because of a lack of an education adequate for the jobs now available. This is deplorable.

One of the greatest needs of our free society is motivation of all of our people to pursue an education throughout their entire lifetime up to the maximum level of their ability. Each individual should recognize it is his personal responsibility to the nation, state and himself to actively pursue education and training throughout his life. If he is a machine tool operator--he should train himself for the successor family of machines as it is being developed. If he is an executive, he should educate himself for keeping pace with new administrative tools such as successive generations of computer systems for quality control. He should not assume that once he has a college degree he has completed his education--he is just beginning it. The degree only signifies that the individual has been educated to a level such that he has the tools for pursuing his education throughout life.

To illustrate the necessity of adult education throughout life, let us consider men in fields such as engineering and medicine. It is now estimated that half of the knowledge such a man has at the time he receives his B. S. or M. D. degree is obsolete in 7 to 10 years. Following this line of reasoning, during the latter part of his professional career only about 1/15 of what he learned while in

a university is still not obsolete. Few of us could earn a living on the 1/15 of knowledge obtained during college which has not become obsolete. Fewer of us would want an engineer working for us or a doctor on us who was so far behind that 14/15 or 93% of his knowledge was obsolete. Obviously such professional people must study their entire life--and other people must also. This line of reasoning also applies to agriculture.

Further, consider the implications of the fact that of the people in the United States who are 25 years of age or older some 60% have less than a high school education; only 8% of these over 25 year olds have a college degree.

In stating the first responsibility, a special effort was made to draw out the position that the female as well as the male must be pursuing an education throughout life. There are many intangible reasons for this position in regard to family life. But let us concentrate on some facts. About 4 million adult women in the U. S. have had less than five years of schooling. These 4 million adult women are essentially illiterate. In addition, over 11.5 million adult women have started high school but never finished. What can these women do as gainful remunerative employment in a society such as ours where over half of the women from 45 to 54 years of age are in paid employment--a society in which 70% of women college graduates hold paying jobs for part of the second half of their adult lives? They obviously need adult education opportunities or they will not get a job in competition with college graduates.

As a closing argument for the thesis that everyone must study throughout life, consider the problem of our free society competing with the Communist oriented society. In 1975, if one assumes the free world consists of the United States, the Americas, Oceania and Europe while the rest of the world is uncommitted or Communist oriented it follows that we will be outnumbered nearly three to one. We must make up by intellectual achievement what we cannot make up in numbers of

people. Such a level of achievement requires a maximum effort from everyone, since all humans, free or Communist, have the capacity for intellectual achievements including science and all humans desire the benefits of technology. Our competition will not be sitting idle.

Consider the second responsibility: "Each individual should participate in the type of education or training program suited to his individual ability and motivation."

There is too much anxiety on the part of parents, which is transmitted to their children, about getting into college or university. Many young people just do not belong in a university. Their particular abilities and motivation are not compatible with what is required for a happy success in a university type program--and every individual needs to feel he is succeeding in his chosen course of action.

This anxiety is partly the fault of the universities. In the effort to communicate to the public the needs of the universities for large sums of money to accommodate the great enrollment increases generated by the babies born after World War II the impression has been made that a student may not be admitted to any university unless he is a demonstrated "genius" in grade school and high school. In addition there seems to be an added social prestige in going to a university over other types of adult education.

It is of great importance we truly accept the premise each person is fulfilling his role in society whether he be a carpenter or eminent mathematician, as long as he is working to the limit of his particular individual abilities. Within such a context, participation in the adult education programs of the secondary schools, technical institutions, junior colleges, state colleges and universities should all be of equal social acceptability.

While all people should continue their education (or training) beyond

high school, many should take a junior college or other program and be a success-- not go to a university and be a flunk-out. Perhaps the best way to emphasize this statement is to say that only 2 of every 10 (20%) of the children in grade school will ever finish four years of college. Some 8 of every 10 (80%) will have to continue their education some place other than in a university degree-granting program.

As one example there are now about 4 million students enrolled in vocational classes. The number has been increasing, on a long term average, at the rate of 80,000 per year. Steps should be taken to extend vocational education to accommodate an increase of 200,000 per year. Yet to do this would add to the total financial problem of education beyond high school at a time when the colleges and universities are running headlong into a financial crisis. I might add that increasing vocational opportunities will not decrease university enrollments.

To graphically illustrate the need for other than college programs, some 23 million young people will enter the job market in the 1960-70 decade without a college degree, but will require pre-employment training of some type. Of this number 7.5 million will not have completed high school, 10.5 million will have completed high school but will not enter college and 5 million will enter but not complete a college degree program.

For all these people the only important point is that each participate in a type of adult education program suited to his ability and motivation.

Consider the third responsibility: "Each individual is responsible for making it financially feasible for the younger people who follow to also pursue their education."

The premise implies that everyone should have an opportunity for education beyond high school regardless of personal ability to pay the cost of the program. If any individual is denied an opportunity for education, society has

chosen--you and I have chosen--to support the person on welfare rather than support education. Such a decision is no bargain to society, or to you and me.

Consider the cost of maintaining the 3 out of every 10 (30%) in the grade schools who will never complete high school. Few jobs will be available to them in a work force that will increase some 13 million in this decade of automation to a level in 1970 of 86 million.

It is difficult for me to understand why our free society seems so intent on denying adequate funds for education when over 25% of the nation's population is a student, a teacher or other employee of the educational system. Yet the annual investment in education is only 4.5% of gross national product--about 3% for the elementary and secondary schools and 1.5% for higher education--or a total of about 1/2 of our national defense budget. Perhaps the problem is rooted in our system of family values where it seems more important to have a second car than it does to personally pay for the education of our children.

Perhaps what is needed is massive federal financial assistance to education! The resistance to taxes does not seem to be anywhere near as great at the federal level as it is at the local, county and state level--yet the federal government collects nearly 3 of every 4 tax dollars in our nation. Perhaps national defense could get along without an increase for a few years. That the federal government has a place in education is clear from the remarks quoted below made by President Lyndon B. Johnson in Chicago in June 1963.

"Evidence over the years has made one fact clear: You pay for a proper system of higher education in one way or another. Either you pay for it positively by considering funds for this purpose as an investment in the future, or you fail to provide enough funds and you pay negatively in lost payrolls, lost taxes, and worst of all, lost opportunities for our young citizens...

"Since the Morrill Act of 1862, the Federal Government has recognized the needs and the importance of a healthy educational system. In that 100 years of Federal participation

in education, there has been no control--there has been no sinister conspiracy--there has been no menace, no threat, no skullduggery of any kind. Most of the fears of Federal domination have been either the imaginings of folks who didn't have all the facts, or demagogues who feast on fear to win votes.

"While education is a local problem, it is also a national concern.

"If our national posture must be stern, our national purpose must be strong.

"The question is not whether we should have Federal help for local education. That was resolved 100 years ago.

"The question now is how best can the national government help the private arena and the local government keep their higher education healthy."

The fundamental problem seems to be that a smaller and smaller proportion of the total population is called on to support two growing groups: a) students in school or college, and b) those on welfare or in retirement. If the supporting group becomes a smaller and smaller portion of the total population the financial load on each individual in the supporting group will have to increase. An alternative, of course, is education and training which will get people off of welfare and supporting themselves, coupled with a program to utilize the talents of retirees so they can continue to contribute to gross national product.

Returning to the problems closer to each of us, consider college and university tuition in our public institutions. Tuition is being increased at an alarming rate, usually because the institutions are unable to obtain sufficient tax or private funds to operate. Raising tuition to levels which prevent many from attending a university, particularly rural youth, even though they have the intellectual ability is contrary to the purpose for which public institutions were created. Scholarship, loan fund and federal tax credit programs are not adequate substitutes for the need to keep low tuition. Furthermore, why should those students seeking their first college degree be expected to personally pay

the cost of their education while society pays the bill for elementary and secondary school students on the one hand and graduate students on the other hand?

At a typical public university the parents or the student is now paying about 70 to 75% of the \$2,000 to \$2,500 annual cost of instruction, room, board and miscellaneous items. The state pays only 25-30%. How many families are prepared to pay their 70-75%? Not many. As a sidelight I might add that most colleges and universities would be pleased if each family reduced its debt while their child is obtaining a university education by not providing a car to their son or daughter.

Examine another seeming paradox. It is common practice to borrow funds for building elementary and secondary schools--thus transferring to the one receiving the education the problem of repayment after he graduates from high school. It is common for public colleges and universities, however, to be unable by statute or constitution to borrow funds for building academic space and thereby transferring the cost of repayment in a manner similar to the elementary and secondary schools. Yet these same institutions can borrow money for dormitories from the federal government and private money lenders. While a few states have permitted issuance of general obligation bonds or revenue bonds for financing the construction of academic space for colleges and universities, more states should be prepared to do so.

The individual--you and I--should be a supporter of the financing needed for all phases of education beyond high school. And equally important, there should be developed a sense of family values such that we are willing to pay for the education of our young and those poorer than we by both direct support and taxes. Let's stop expecting a nebulous "someone else" to foot the bill and pay the taxes.

Consider the fourth responsibility: "The nature of employment opportunity and the use of leisure time is rapidly changing--and each individual is responsible for preparing for change and participating in a manner which helps fulfill national goals."

Perhaps the most dramatic indicator of the change in employment opportunity is the fact that white-collar workers now outnumber blue-collar workers. In addition, even most factory jobs are open only to people who have a high school diploma. This change to a basically white-collar manpower force demands a high level of educational background.

Between now and 1970 the biggest gains in the work force will take place in the service industries, finance, insurance, government and real estate. Partly because of the growth in service industries, more jobs will be available for women--at least for those who have adequate education. In 1970 women will make up 34% of the labor force. Some growth will take place in construction and trade payrolls by 1970.

The proportion of workers in transportation, mining and utilities will decrease, though the absolute numbers will increase. Fewer people will be employed in production agriculture, forestry and fisheries.

In theory, an increase in white-collar jobs means more people with a substantial education, a higher income and more leisure time after the necessities of life have been met. But if this higher income leads only to leisure time of an unproductive nature we will be going downhill. If the leisure time is used only for watching TV cowboy shows and dropping litter around our national parks, as examples, we would be better off as a nation to not have the leisure time.

One of the greatest challenges before our society is to structure adult or continuing education in such a way that leisure time is translated into productive intellectual study directed to increasing the capacity of each person to

contribute to the economic and social development of the nation. This includes study for avoiding obsolescence in one's job. It is a difficult national task to achieve a translation of leisure time into adult education time. The difficulty comes about, of course, because participation in adult education is strictly voluntary and requires exercise of the mental muscle--while man is basically plain lazy.

The problem is further aggravated by the fact that most of our people are too young to recall serious national economic difficulties, or international scale war. To illustrate this, 56% of our population was not yet born at the time of the 1929 stock market crash. Some 64% are too young to remember the start of the Franklin D. Roosevelt New Deal. An amazing 48% are too young to recall World War II. As a matter of interest, 64% do not remember prohibition and 87% do not remember when there was no income tax.

Now shift to a study of the dividends which accrue from education beyond high school. Consider the first dividend: "Lifetime monetary and intangible personal income will increase in proportion to the level and continuance of educational achievement."

The monetary benefit of additional education is easy to document. In March 1962 some 9.2% of the people without a grade school education were unemployed; while only 4% of the people with a college education were unemployed. A high school graduate may earn, on the average, \$46,000 more in his lifetime than a person with only one to three years of high school. The college graduate may earn \$180,000 more than the high school graduate. An individual with a Ph. D. degree may earn \$250,000 more than the high school graduate.

This additional income for additional education not only means a much better standard of living for one's family, it also means that by increased tax payments and higher economic productivity society's investment in the education of

the individual is returned several fold.

Furthermore, as the educational level goes up inventions become commercially available consumer goods in a shorter and shorter time. The time between discovery and commercial application has changed as follows: photograph-112 years; telephone-56 years; radio-35 years; radar-15 years; television-12 years; atomic bomb-6 years and the transistor-5 years. This trend will continue toward zero years as our education advances--to the benefit of all of us.

Partly because of such rapid technological development we are able to participate in and enjoy the intellectual or intangible fruits of education only if that education is continual throughout our lifetime. How can one participate, for example, in the challenge of the Mariner II space probe unless he knows something of the hypotheses about the climate and behavior of Venus and the problems of constructing and assuring the reliability of such a probe? Some of course will say, who cares? But consider other examples--music appreciation, art appreciation, time for exploration of the natural environment about us. The ability to engage in an expanding range of intellectual discussion of abstract matters--sheer using of the intellectual muscle for thinking, the ability that makes man a man and not a vegetable.

Perhaps the greatest intangible benefit of all would accrue to the individual if he participated in adult education throughout life by its impact on his children. How can we expect our children to develop a sense of value of the lifetime educational process if they never see their parents open a book during the full twelve years they are in elementary and secondary school? Our children's whole outlook on education might well be different from kindergarten to grave if the parents undertook continuous adult education.

Consider the second dividend: "The state and the nation are the primary beneficiaries of education--the individual is the secondary beneficiary."

The benefits of education to the individual shrink into insignificance in comparison to the benefits to the state and the nation. First, of course, recall again that the economists tell us economic growth is linked as much to education as it is to material wealth. A nation without education has poverty and famine; a nation with education may have a prosperous economy, generally high standard of living and the ability to provide welfare to avoid famine of its uneducated.

Examine the decreasing influence of the strike threat as a tool of labor. A strike always means at least a temporary loss of economic productivity. Strikes are no longer an effective threat in many industries. Through automation--a product of an educated manpower--many factories can run for months with only a nominal number of people around. Society reaps the benefits of not suffering a stoppage of goods and economic productivity. Furthermore, an educated populace will not tolerate on rational grounds any work stoppage that adversely affects the nation or state. The classic example is the 1963 rail strike threat stopped by Congress.

Explore an example close to your hearts. The people of the U. S. have benefitted immeasurably from adult education of our agricultural peoples through the cooperative extension services. Our agricultural production constitutes the most efficient industry on earth. Our entire society benefits--I doubt many of you would say the individual farmer is the primary beneficiary of this adult education!

To further illustrate that society is the principal beneficiary, review the world food problem. It cannot be solved by exporting our annual supplies. If this country's annual food surplus were transported abroad to the hungry of the world it would constitute the equivalent of only one cup of rice a week! The need is for the export of adult education to these hungry societies by conveying the

knowledge and techniques which produce food. Recall the Chinese proverb: "If you give a man a fish, you feed him for one day; if you teach him to fish, you feed him for many, many days."

A nation's economic and social development takes place in proportion to its investment of material wealth and educational wealth--major benefits in comparison to the secondary rewards to the individual who only gets a higher standard of living and who repays society's investment in him several times over.

This seems to me to be more than enough justification for society to be the major supporter of education beyond high school. It is not reasonable to say the individual is the primary beneficiary so he should pay the bill directly in the form of tuition.

To conclude the argument for the proposition that society is the primary beneficiary of education, recall the prophecy of the philosopher Alfred North Whitehead:

"In the conditions of modern life the rule is absolute: the race which does not value trained intelligence is doomed. Not all your heroism, not all your social charm, not all your wit, not all your victories on land or at sea, can move back the finger of fate. Today we maintain ourselves. Tomorrow science will have moved forward yet one more step, and there will be no appeal from the judgment which will then be pronounced on the uneducated."

In summary, some of the responsibilities and dividends of education beyond high school are as follows.

A. Responsibilities

1. Everyone capable of completing high school, male and female, should participate in education or training beyond high school throughout their entire life.

2. Each individual should participate in the type of educational or training program suited to his individual ability and motivation.

3. Each individual is responsible for making it financially feasible for the younger people who follow to also pursue their education.

4. The nature of employment opportunity and the use of leisure time is rapidly changing--and each individual is responsible for preparing for change and participating in a manner which helps fulfill national goals.

B. Dividends

1. Lifetime monetary and intangible personal income will increase in proportion to the level and continuance of educational achievement.

2. The state and nation are the primary beneficiaries of education--the individual is the secondary beneficiary.

You are probably all acquainted with the old saying of economists: "As steel goes, so goes the nation's economy." This is no longer true. It is increasingly evident to educated mankind that: "As education goes, so goes the nation--its economy, its role in the free world and its leadership in the development, conservation and utilization of the values of humanity."

In conclusion, ladies and gentlemen--"Ask not what education can do for you, ask what you can do for education." Thank you.

LIST OF REFERENCE MATERIAL

1. University Adult Education by Renee and William Peterson, Harper, 1960.
2. Training Activities Under the Manpower Development and Training Act, Report to Congress by HEW, No. OE-80027, Circular 706, March 1963.
3. Annual Reports of State Boards of Vocational Education, Fiscal Year Ended June 30, 1961, HEW Report OE-80008-61.
4. The Mathematics of Hunger by Carl Bokal, Saturday Review, April 27, 1963.
5. The Big Strike: A Thing of the Past? By A. H. Raskin, Saturday Review, November 16, 1963.
6. Articles in the Denver Post:
 - a) 25 Million Adults Attend School--June 1963.
 - b) Adler Terms Education at Adult Level Vital--November 10, 1963.
7. American Women, Report of the President's Commission on the Status of Women, October 11, 1963. Summarized in Saturday Review, November 16, 1963.
8. Educating Engineers for '88 by Frederick B. Morse, American Engineer, October 1963.
9. Of the 189 Million People in the U. S., U. S. News and World Report, August 19, 1963.
10. Just 7 Years from Now, U. S. News and World Report, December 2, 1963.
11. Education for a Changing World of Work, Summary Report of the Panel of Consultants on Vocational Education Requested by the President of the United States, 1962.
12. Education: Answer to Unemployment by W. Willard Wirtz, The Rotarian, December 1963.
13. U. S. Census of Population, U. S. Summary, 1960.
14. Speech of June 1963 in Chicago by President Lyndon B. Johnson was published in "College and University Journal", a publication of the American College Public Relations Association.