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ABSTRACT

On an overall basis, the United States is still the cheapest free world country in which to produce goods. If the United States is to retain this distinction, however, steps must be taken to reverse the trend toward yearly declines in the rate of gain in U.S. productivity. One way in which vocational education can help increase the productivity of the American labor force is to place less emphasis on the job- and industry-specific skills that can be taught most effectively by industry itself and to concentrate instead on preparing students for a world of work in which they must never cease learning and growing. In general, vocational education has neither the facilities nor personnel to provide effective training in high technology areas. What vocational education can do, however, is to train workers in the basic, transferable skills that they will need to succeed in the job-specific training that is best provided by the private sector itself. Vocational educators also need to develop courses that will teach students how to handle, manage, and just get along with others. To do this most effectively, teachers and administrators alike must make increased efforts to ascertain first hand exactly what skills business and industry require of their prospective employees. (A series of questions and answers is appended.) (MN)

Occasional Paper No. 95

CRITICAL ISSUES IN VOCATIONAL EDUCATION: AN INDUSTRIALIST'S VIEW

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The National Center for Research in Vocational Education
The Ohio State University
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FOREWORD

The state of our economy has become a national preoccupation in America today. This subject has pushed the weather report and discussions of football and hockey from the front pages of our newspapers and from our personal conversations. We find ourselves focusing on such concepts as reindustrialization, productivity, employment and unemployment, technological literacy, and training and retraining, to name but a few.

Additionally, the context of the American economy has moved well beyond our local boundaries. Increasingly, we are conscious of being a part of a global economy with worldwide interactions. Our nation's ability to compete in the international marketing arena has become important to us all.

Through all these economic currents and crosscurrents is a persistent theme: the need for improved relations and interactions between vocational education and the private sector. These improved relationships promise a better identification of labor market trends and needs. They also promise greater relevance in the match between training and job placement of graduates leaving our programs. A stronger link between the two sectors would mean stronger support from the employment community for training programs, and would ensure a means of keeping programs current and self-renewing.

Our topic today is the relationship between vocational education and the private sector. Our speaker, Mr. Peter J. Elliman, is a mechanical engineer and currently Vice-President and General Manager of Lucas Industries, Inc., of Greenville, South Carolina. He was born in England and started working for General Motors as an apprentice at age sixteen. In 1959, he was awarded a General Motors overseas scholarship and came to the United States for two years. During this time, he obtained experience at various General Motors plants while getting his undergraduate degree in industrial engineering at the General Motors Institute. Later, he became Director of Industrial Engineering for General Motors.

In 1976, in conjunction with four other men, Mr. Elliman set up a small electronics company that today provides the majority of the major exhaust emission test equipment supplied to General Motors. In 1978, he was hired by Lucas Industries as Vice-President and General Manager of the United States manufacturing facility. In June 1982, Mr. Elliman was appointed General Manager of Lucas Industries in the United States and Brazil. He is a member of the executive board of Lucas Industries, North America, and in addition, he is a business advisor to the Navajo Indian Nation. Further, he serves on the board of directors of the General Motors Institute.

On behalf of the National Center for Research in Vocational Education and The Ohio State University, the National Center is pleased to share the presentation by Mr. Peter J. Elliman, which was delivered on March 3, 1983 and entitled *Critical Issues in Vocational Education: An Industrialist's View*. For those who are interested a videotape of the presentation is also available.

Robert E. Taylor
Executive Director
The National Center for Research
in Vocational Education

CRITICAL ISSUES IN VOCATIONAL EDUCATION: AN INDUSTRIALIST'S VIEW

Industrial and economic policy in the United States today is affected by many international forces and factors. Today, America stands as a beacon to the entire industrialized world as the finest country in which to live, work, and locate a manufacturing plant. It is the most advanced and industrialized nation in the world, but American industry is competing in a world economy. Today, it is not just South Carolina competing against Ohio for a particular industrial plant, but rather Ohio competing against Korea, South Carolina against India, or Michigan against Japan.

I am a vice-president and general manager for Lucas Industries, headquartered in Birmingham, England. Lucas is an international conglomerate that owns or contr s 350 companies in thirty-five countries around the world. We trade in every country in world except two—Albania and North Korea. My own particular responsibilities lie in North and South America where Lucas has some thirty-two companies that manufacture goods and products in the diesel, aerospace, and industrial sectors. As an industrialist, my responsibility is to maximize my resources and to return a profit to my board of directors and stockholders. Like most U.S. managers, a large portion of my salary is governed by the profitability of the companies for which I am responsible.

When Lucas evaluates a country for the potential location of a new plant, it examines such important elements as labor unions and labor costs, trade regulations, taxes, inflation, the strength of the currency over time, the availability and quality of technical schools and universities, the skill and productivity levels of the work force, attitudes toward work, the standard of living, and the cultural environment. The overall climate within a given country is the climate on which they must base their decisions. We can influence certain factors, such as the skill level and attitude of the work force that we employ, through training, quality circles, and other such innovations; but most factors are so embedded in a country's economic policies that we must expect to operate within them to make a profit.

For example, inflation in our Brazilian plant is running at about 110 percent annually (as of 1982), and this has become the most crucial factor to weigh in any decision regarding that plant or otners in Brazil. One of the tasks that the comptroller of the Brazilian operation is evaluated for is his ability to obtain an 8 percent per month yield on the company's investments.

The overall productivity of the work force is a most important factor. America's productivity rose at an average annual rate of 3.0 percent from 1950 to 1966, but since then its growth has continued to slow from 2.3 percent between 1966 and 1973 to less than 1 percent in 1980. Today, the American media are concerned about reported annual productivity gains of 8 percent in Japan, compared to 1 percent in the United States. The implication is that the Japanese are eight times better than Americans as workers. However, consider that in the same set of statistics showing annual gains, Vietnam improved its productivity by 53 percent. Obviously, this does not mean that Vietnam is now fifty-three times more productive than the United States. It simply means that from where the Vietnamese started, they have made significant progress, but no other comparison is implied.

If you were to compare the overall cost of manufacturing a certain product in various free world countries, you would find that the most expensive country today is West Germany. Let's say it will cost one hundred cents to produce a product in West Germany—the top of the scale. As you come down the scale, it will cost ninety-two cents to manufacture that same product in France, eighty-eight cents in England, eighty-seven cents in Japan, but only seventy-two cents to make it in the United States. So today, even though the U.S. productivity gains are less from year to year than in certain other countries, it is still, on an *overall* basis, the cheapest free world country in which to produce goods.

Although it is important to be proud of these facts as Americans, we must remember that when Japanese workers increase their productivity growth by 8 percent annually and we increase ours by only 1 percent, they may be doing some things better than we are. Some countries have economic advantages that American business does not have. Some of the advantages are voluntary; others are government aided. Japan, for instance, does not operate within the context of total free trade. In the past, they have limited our imports into their country, while we have placed no restrictions on theirs.

Recently I had an industrialist from India tell me that he had borrowed all the money he wanted from the World Bank at 6 percent and what would Lucas like his company to manufacture for us. America contributes the majority of the entire World Bank's resources to developing countries. This man's corporation had access to our money to pay India's workers twenty-five cents an hour to make whatever we would like them to make. That is our competition, and we must not ignore it.

The Japanese, though, have an industrial and economic system much closer to ours than India's, and they are our number one competitor in many areas. Americans can learn many lessons from the Japanese. One example is their attitude toward work and the environment of trust existing among workers and employers in Japan, both of which strongly affect productivity. In Japan, both employers and employees work together in an environment of trust. Americans (and the English) tend to work in an environment of distrust. In fact, Americans seem to run most of their mutually dependent systems—including relationships between industrialists and educators—in such an environment of distrust.

Lessons to Be Learned from Other Countries

Americans typically complain about their country. In part, I am convinced that the media in this country have created this less than positive attitude, and I would hope all of you have the opportunity to go overseas and visit other countries so that you can be reminded of how fortunate you really are. This kind of nationalistic self-criticism and critical attitude does not exist in France or Germany, and certainly not in Japan.

An illustration of how the Japanese live in an atmosphere of trust may be helpful. When I visited Japan, I was given the opportunity to tour a Japanese school. As I was being escorted through the building, I noticed that an emergency exit sign was over one of the doors, one similar to ours here in the United States. The actual emergency exit light, however, was a flashlight on a magnetic base. I asked my tour guide why they used such a light that was not permanently secured when surely they knew it would be stolen. He had difficulty in understanding my statement. At the time I was unaware that the incidence of theft in Japan is miniscule. To secure the light to the wall with something more than a magnetic base was unnecessary.

To give you another example, when I toured another plant in Japan, I noticed that the workers had brought in potted plants and flowers and placed them throughout the manufacturing and loading dock areas. We, traditionally, do not allow that in America because we would end up having a department in a unionized facility being made responsible for watering flowers on company time. The Japanese workers brought in the plants and cared for them because they enjoyed it.

We forbid our workers to do some of these more basic things because we operate within an atmosphere of distrust. Distrust is very costly. When I was employed as a plant manager for General Motors, I learned about the cost of distrust. When suppliers delivered materials to our assembly plant, they were automatically stopped at the gate by security to determine whether they were authorized to enter. Once the drivers were allowed on the plant grounds, they immediately pulled their trucks up to a loading dock and proceeded to wait for hours until the materials were unloaded. When plant workers finally unloaded the trucks, we would always count the quantity of the shipment, check the quality, store it, and then a week later deliver it to the assembly line. All these delays cost time and money.

In Japan I watched a delivery truck arrive at the Datsun plant where it was stopped at the security gate and directed to a loading dock. A foreman immediately unloaded the materials and placed them right on the assembly line. I asked the Japanese foreman how he knew the supplier had shipped the right quantity. He told me he knew because he had asked them to ship that many. I asked him how he knew the quality of the items was satisfactory. He told me it was because he was paying for them. At many GM plants, today, they have eliminated inspectors on the loading docks and are beginning to trust their suppliers.

Another thing Americans can learn from the Japanese is to maximize the potential of people. The goals of an industrialist and the goal of an educator are the same, namely, to maximize the potential of people. The real role of educators is to help their pupils become all that they can be. The potential of some students or workers may not be more than to be a dishwasher, but we must help them to become good dishwashers. Others may have the capacity to become doctors, engineers, astronauts, and bank presidents; similarly it must be our goal to help them become those professionals to the best of their ability.

Business and industry need the maximum that their workers can give, and so they must be careful to avoid stereotyping individuals into traditional roles. Too often, management's predetermined concept of a worker's potential can limit that worker's real contribution. For many years corporate management sought after the man, and not the woman, who held a four-year engineering degree with honors. If a man barely graduated from high school, then he remained a blue-collar worker, presumably incapable of achieving within the corporate structure.

Today, we more fully appreciate the difference between a vocational student and a college graduate. The college graduate dreams of ways to make money, while the vocational student actually makes money for the company. The private sector values the vocational graduate far more than we ever have in the past, and we want to support vocational education and get involved. This is especially true when the question of training costs is examined.

Every time my company loses an employee and hires another, it costs the company ten thousand dollars. This figure represents the estimated average industrial cost for worker turnover. Technicians cost twenty thousand dollars, and managers cost between sixty and seventy thousand dollars. Turnover is a significant cost to industry. In Europe and Japan when you hire workers at age eighteen, they almost assuredly will stay with you until they retire. In America, 60 percent of college students leave their first place of work within two years. The turnover costs involved are astronomical.

We need to be concerned about the quality of vocational education, because 80 percent or more of vocational education students will work for companies like mine. In today's world of work, only about 25 percent of the available jobs require a college education. Yet the colleges and universities keep recruiting and graduating people in fields that are already saturated. Interestingly, in the state of South Carolina, one of the largest groups attending technical colleges is college graduates who cannot find jobs. Universities and higher education serve an important role in America's future; they make an invaluable contribution to the areas of basic research and the professional fields. Without higher education our society would not be nearly as technically advanced and culturally alive. However, higher education is not appropriate for everyone, and here in America many students and parents have been deceived into believing that they must possess a four-year degree to maintain a good standard of living.

Vocational Education and the Private Sector

A question of credibility for vocational education in America still exists today. Vocational schools do not have the respect of the public yet. Vocational instructors and others in vocational education are not as highly regarded as the teachers and professors who teach "real school." But, fortunately, this is changing.

A fundamental point professional educators need to understand is that today's industrial workers must never cease learning and growing. Regardless of what individuals have accomplished or learned up to a point in time, in five years their skills will be obsolete and they will have to be retrained. Let me share some insights about education from an industrialist's viewpoint. Last year, I delivered a speech to a conference of educators, and during the discussions that followed, a school superintendent bemoaned the fact that he has to deal with educating people for twelve years. Then a university president complained about having to deal with educating people for four years. My response to those comments is that we industrialists have to deal with their end products for forty-eight years; every five years we have to teach them a new skill. Furthermore, many of these people never really learned how to study effectively so that we can retrain them easily.

I am concerned about the issue of teaching job-specific and even industry-specific skills in vocational education. Recently, I spent some time in Atlanta observing the displays at a vocational and technical training convention, and while there, a salesman tried to sell me a laser gun. Obviously, I was not interested in purchasing a laser gun, but I was interested in determining just where the market for a laser gun was in education. He told me he was selling them to vocational educators all over the country. As an industrialist, I am pleased that vocational education is eager to meet industry's high-technology training needs, but training of this type cannot be done effectively in a vocational school. They neither have the facilities nor personnel to do it right, and further, it is so specialized it becomes counterproductive.

Vocational education in general should not be offering training like this at the threshold of technology, because it cannot really afford to pay for it. Furthermore, the money that the public school system invests in this new technology will be wasted, because the equipment will be out-of-date before students graduate. A vocational school cannot train students on a laser gun for a job in my company unless that school can continue to stay at the threshold of technology in the laser guns that my plant will be purchasing. I would much prefer that the schools concentrate on teaching their students the basic, transferable vocational skills that they will need when I teach them the applied technology I utilize. The basics are the skills that business and industry can most capitalize on in years to come.

Another issue concerning me is that the message about industry—what it is and the principles it operates under—is not filtering down through the school system. At Lucas Industries, we once hired a young lady who was nineteen years of age and had been recently graduated from high school. She had been with us for four months when she quite sincerely relayed the following observation to me. "Mr. Elliman, you really surprise me. I didn't know you worked in the summer; I always go to the beach in the summer." What made this young woman think that people don't work in the summer? Her SAT scores were between 900-1000; she was a high school graduate; and she did not even know that people in the labor market work year-round. Her error is only one example of the kinds of misinformation that many new workers have.

Career guidance counselors need to be more concerned about the type of services they provide to students. In my state, for example, out of one hundred high school principals and counselors attending a recent conference, only two had ever been in an industrial plant, yet plants are the major employers of their students. These are the people who are advising tomorrow's youth about the work world, and they do not even understand its problems and needs.

Secondary and postsecondary standards are also issues that demand attention in the field of vocational education. In South Carolina's school system, graduates from the secondary high schools are not necessarily qualified to enter a postsecondary technical training institute. My question is, Why aren't the technical institutes and the high schools collaborating with each other? Why are the high schools graduating students who are not qualified to enter the next level of training? If they are not qualified for this, then they certainly cannot be expected to go out into the world of work and earn a living. Increasingly, the public is going to hold the educational profession accountable for its actions.

There are things that you, as educators, and I, as an industrialist, can do together to alleviate some of the problems. This institution, the National Center for Research in Vocational Education, is obviously not going to convert the nation alone. South Carolina may have the best vocational education system in the country, but the National Center is not going to have much impact on South Carolina until industry and education work together. Educators, by themselves, do not have the clout to make the changes that are necessary to reindustrialize and retrain the people of this country.

Recommendations for Action

Let me try to make clear to you what it is that I—as a representative of industry—want from you. Your job as an educator, whether you like it or not, is to develop and sell an end product, namely a student. The student's first job when he or she leaves high school is to sell his or her skills to someone like me. You must train your students to acquire those marketable skills or I will not buy them. That is a fact.

One of the problems you face, however, is that the private sector is unable to tell precisely the occupational skill demands it will need in ten, twenty, or even five years. A major fundamental in operating our plants is that we must be flexible in what we market; consequently, we do not know what we will be manufacturing in 1995. Furthermore, with the rapid changes in technology, we do not know whether we will need laser technicians or robotics technicians or both. Given that fact, I have some ideas of what you can do for me, always bearing in mind that whomever I hire will have to be retrained every five years or so.

One way to describe what I want is to tell you what you would have to do if you, as individuals, wanted to work in my plant. First, you would have to apply for a job, and if you were accepted, you would go through six weeks of preemployment training on your own time, for which Lucas would not pay you. The training program would be operated by the local technical college, with company trainers overseeing it. At the end of the training program, you would still have no guarantee of being hired. You would have only been accepted into the course—not guaranteed a job. During those six weeks, we would watch for people with the right attitude toward learning and working. As an example of what we teach, in our training program you would become proficient in such basics as metrics, because teaching you about laser technology is pointless if you do not even understand the metric system.

Suppose that you get through the six weeks of unpaid training. If I hired you, you would next be paid to go through another three months of training, but you would not go to work in the main plant until I considered you to be ready. My plant of 450 people in South Carolina has twelve full-time instructors and a budget of $1 million per year for training. We realize we have to get the maximum out of every worker in the plant, so we have to look for people who are trainable and who have a positive attitude toward learning.

No real criteria exists, of course, for just how good each worker must be, but all companies need people who are responsible. Our managers pass accountability and responsibility down the line to the shop employees. Let me give an example of how important accepting responsible is for our workers. While touring my plant with a visitor one day, we stopped to talk to one of my workers whom I'll call Mary. I asked her to explain her job to the visitor and to tell him where she had worked before she joined my company. She told him she had been a checkout clerk at a supermarket. Then I told the visitor that the equipment Mary was running was worth half a million dollars and that she had been with my company for two years. I then asked Mary if she had any problems that day. She said, "As a matter of fact, Peter, I have a problem; I have a three-micron taper." Three microns is about thirty-millionths of an inch, and in our work, a three-micron taper is a serious problem. I asked Mary if she could take care of it. She said she thought she could, and because we operate under a new style of management, I walked away and left it to her. Of course, I would have been less than a good manager if I had not talked to the supervisor and had him check on Mary's problem later in the day. Incidentally, I do not recommend this new management style if you are prone to ulcers.

My real point, though, is that a company with good training and good management policies can take a checkout clerk who used to make $3.25 an hour and, inside of two years, have her correcting a production problem of thirty-millionths of an inch. But we need the educational system to turn out trainable graduates, and we need educators to teach students about industries and how they operate. This becomes very difficult if educators never spend time with the companies' representatives and never come to understand industries' needs.

Education also needs to develop courses that will teach people how to handle, manage, or just work with other people. People can get degrees in business from most universities without ever taking one course in how to supervise and work with people. You can go through just about any engineering school in the country to become a manager without taking any courses in human relations. Graduates from vocational schools may become supervisors or even managers, yet they get no training in working with people either. If we study the Japanese, Korean, and Indian companies and listen to the theories about consensus management and Theory Z, clearly the success of these companies is based on how they get people to work together.

One of my greatest problems as an industrialist is orienting college graduates to my plant and teaching them how to manage the workers who actually run the equipment and who are, for

the most part, high school graduates. The first thing I tell college graduates is that they should not make decisions. Yet, all their lives, up until that point, they have been training to make decisions. The new style of management, however, dictates that the people who do the work and understand the problems are the best qualified to make the decisions; managers are responsible for facilitating it.

The most valuable resource my company has is its workers. They may be relatively uneducated, at least academically, but I can guarantee that the woman operating that one-half million dollar machine knows far more about it than any college graduate working as a manager. The moment Mary's manager, for example, interferes and tells her how to do her job, she will know he is wrong. She will have to do what he says, but she will know he is wrong. That manager will cost the company a lot of money until he learns to let her do her job, or at least to listen to her solutions. Industry needs people who have been taught how to manage and how to work with people, and that is something our educational system must improve upon.

In South Carolina, we are trying to address some of these problems. First, we have initiated a program to give teachers, counselors, and principals the opportunity to visit our plants one day a week. There, we show them what we do and what kinds of skills our workers need. In this program, teachers visit a certain number of plants every year. The teachers have given us problems, though. They want to be reimbursed for their time if the visit runs longer than the regular school day. Consequently, we have to finish each visit by 2 p.m. to allow them travel time. The school principals like the idea behind the program but want somebody else to pay the fifty dollars for the school buses to transport teachers, so we have to work on those hurdles.

We are operating a technical scholar program in South Carolina that takes the best eighteen-year-olds available who are not going to college and places them in a special cooperative industrial program. We now have thirty-two companies involved in this program that offers technical school courses in the morning and an opportunity to work in the afternoon. The three-year program is quite revolutionary because a consortium of companies collaborates on what students should learn and what we will pay them to learn. This program was created when all the companies realized they had a mutual problem—a shortage of workers with critical skills. We are very proud of the graduates of that program; they have gone on to become talented and committed workers.

Another of industry's efforts involves collecting extensive data on our workers who are high school graduates to determine their opinions and experiences for up to five years after their graduation. We hope this will give us information that will help us improve our own training programs and management systems. But it should also be useful information to the schools who turn out these graduates.

Quite a few high schools, vocational schools, and technical colleges have advisory boards. Having these is a good idea, provided the schools make meaningful use of them. Too many times, advisory boards are ineffective because they are not used responsibly. Educators have a high—very high—responsibility to use industry people on such boards, and use them well. But do not expect an industrialist to go to a vocational school and say, "What can I do for you, today?" The responsibility lies with educators, first. Teachers should take enough interest in their end product to come to industry and request help. Most industrialists are willing, even eager, to contribute time, energy, and resources.

Remember that American business and industry is competing against the world. It is not a game; it means real jobs that affect real lives. Very few will ever have the experience that I have had of laying off three hundred people because there was no work. It is heartrending to see the

desperation on people's faces. It is pure torment to hear the report of a man who, six months later, could not find a job and committed suicide.

The Indians, Koreans, Japanese, British, and others are doing all they can to create and sustain every last job in their countries. Unless we can learn to work collectively on our most precious resource, our people, to help them achieve their best and to make a contribution to our economy, we will lose the battle to create and keep jobs in America. Preparing students to become effective workers is not a game, and you, the educator, are involved, whether you want to be or not.

QUESTIONS AND ANSWERS

Peter Elliman

Question: I have talked with training coordinators in industry who believe they have the job because their bosses feel the company needs to do training; but the position is little more than a token. They also do not have much of a budget to work with, certainly not as substantial as they feel they need, mainly because they have not been able to convince their bosses of the payoffs of conducting training. Have you been able to work out any kind of an algorithm, or to quantify in some way, what you think the payoffs are for the training that you provide your people?

I guess the algorithm is survival; the companies that do not train will not survive. Unfortunately, you may not see that in the short-term, but in the long-term it is very true. A company owner has to have a dream, and the dream must include the realization that training is important. To get some old-time industrialists to dream that dream may be very difficult, if not impossible, but the modern generation—in fact, the generation that has gone through these past four years—is now looking at training in a light in which it has never before been perceived.

Many companies can give you statistics to show how they train and save money. Money is always the bottom line. One of the ways to save or make money is to eliminate single-skilled employees by expanding their training. In our plant, for instance, we do not have separate electricians, machine repair, or machine maintenance people; we have people with one general skill area, and incidentally we pay them more than for one job but we do not pay them for three. My forklift driver maintains the forklift truck. We do not have sweepers or janitors in the plant, the people clean the plant.

When you go out in the world, you are going to find both industrialists and educators who are not interested in innovations or new programs for training. They may be only forty years of age, but in their attitudes, they are finished and retired. You have to find the few who are willing to try something new, and when you have found them, you must capitalize on their interest. With that will come success.

But America is changing. I spent part of this week with the Society of Automotive Engineers in Detroit; I have known the managers there for many years and things are different than they were five years ago. Companies and other organizations are thinking thoughts that they never thought before. A better opportunity may not come along for educators to get involved and get on the training bandwagon.

Question: You have indicated that every five years you retrain people who work for you. On the average, vocational teachers have been teaching anywhere from seven to nine years. How would you maximize the potential of vocational teachers?

I suppose I would retrain them. Actually, I do not believe that teachers should go directly from the university to teaching. I think, first of all, that they should start working in the real world, as

we call it, and learn some humility. I say that quite seriously. The first two years you are in the real world, you become very humble, because you realize that what you learned at the university is not necessarily happening. Only then should you go into teaching.

A program for vocational educators should be developed to allow teachers to work in the private sector; that is, every fifth or seventh year, your school district should be sending teachers out on a sabbatical into industry. School systems have to adjust so that companies can also send people from industry into the schools, a difficult situation. I have several people in my operation whom I would love to lend to a school superintendent and say, "Here is a man who is good in laser technology; you may have him for a year." But then we have problems yet to solve, such as when the man doesn't have tenure, when the school has laid off somebody, when the union doesn't like it, or when the industry representative makes more money than the teachers over here.

The first step is for educators, as professionals, to personally accept the concept of retraining. That is a big step. Second, you have to find the opportunity to get more business and industry experience. I guarantee that I could easily find ten companies in this area that would be willing to receive educators into their plants one afternoon a month to explore the business and evaluate it. But *you* have to ask first. One problem is that we do not have good communications or trust between business, industry, and education. Forums for vocational teachers to meet industry representatives are almost nonexistent.

The National Center can set an example in providing such forums. I would hope that if you believe that 80 percent of vocational students are headed into industry, that 80 percent of your staff seminar speakers will be from industry—aerospace, computers, or whatever—explaining what they are looking for in graduates. I did not do a good job of describing what I, as an industrialist, am looking for, because what I offered you was mostly a personal philosophy. What *you* really should be doing is developing specifics.

Question: Can you give us some specifics in regard to the qualities that you think the ideal vocational graduate ought to possess as your employee? If the schools were to set a target according to your standards, what should their ideal "product" look like, according to your best description?

I am looking for individuals who can read and write, which rules out quite a large percentage of the ones that apply to Lucas Industries. My ideal worker would also have common sense, understand my industry, be willing to accept that he or she will not reach the top in a year, and realize that he or she will have to work hard for the rest of his or her life. That is what I am looking for. I am looking for a young man or woman, black or white—I don't know the difference, and I mean that quite seriously—who will accept me as an ally and not as an enemy. I want this person to have been taught some of the basic social graces. I was telling some counselors the other day that I wish they would teach their students how to fill out a job application form. Sixty percent of the graduates who apply for jobs at my plant do not fill out an application correctly.

What counselors and students do not understand is that all companies start a file on every person who applies and gets a job. That file is in date order, which means that for the rest of a worker's life, every time I open his or her file I will first see that application form, scratched out, with his or her name spelled wrong.

The problem that I have with college graduates who come to me is that a majority of them are of the opinion that I will hire them as they are. That means if they want to come in jeans and

sneakers, then I am still expected to recognize the potential in them. I want you to know I am a bad judge of character when I am forced to base it on jeans and sneakers.

Another problem I have is that my secretary runs my life in fifteen-minute segments, which means I interview four people in an hour. If a job applicant comes five minutes late, he or she gets only ten minutes. When they do not know what I do, or what my company does, they will also be at a disadvantage.

I want you to know that I am a little sensitive on these points. Students ought to learn these things, and they ought to learn them in school. All students should be required to take a course on "selling" themselves, because it is the first thing graduates do when they leave school.

Question: Let's say that I am an administrator of a college and I have very limited resources. For example, I serve a primarily black, disadvantaged population. But I really want to improve my programs through working with the private sector. What would be the first steps I should take to be really constructive?

Call and make an appointment with me. Get in your car, and come tell me your problem. Ask for my help, because we are all gullible enough to offer our help to people who approach us in the right manner. There isn't anyone in this room who, if approached and asked correctly, would not volunteer to help. Come to me with a specific question or request. Don't expect me to be a genius and to have the answer. Tell me, for example, that you are in an all black community with 40 percent unemployment, that you have a training problem, and that you need some more equipment. You have to come to me with a specific problem.

In particular, remember that people like me contribute heavily to political campaigns. Determine how you can utilize that power, because that is where we, as industrialists, can be of best use to you. If you are in a black community and you cannot get attention, I probably can. Use the people with the power, and that includes the people who are on your advisory board.

Question: I am sure you are aware that education in South Carolina has sometimes been criticized for getting into bed with industry. They have been accused of producing people who are too servile, and they are discouraging unionization. How do you respond to those kinds of criticisms?

In the past, South Carolina's economy was dominated by the textile industry that thrived on the availability of cheap, clean water and cheap labor. When Senator Hollings set out to start the state's technical college program, he did so because, in the 1970s, it was evident that the textile industry was dying and South Carolina needed to develop new industries. Senator Hollings is a great believer in getting the people together who can make things happen, and that is exactly how he organized the state's Technical Education System. Again, remember that the best way to accomplish something quickly is to use the people who have power. If you call that "getting into bed with industry," then I guess South Carolina is doing it.

To address your question as to whether or not the educational system in South Carolina makes people servile, I have found personally that the South Carolinians are independent, free thinking, and religious, but far from servile. South Carolinians have a work ethic that is superior to that of any other workers I have in North or South America. But I have to handle them correctly. We had an unusually large production demand two years ago, and as a result we worked forty-seven Saturdays and thirty-five Sundays. The people in the plant had a problem

with that because working on Sunday meant missing church. I told them, "Here is my problem: The customer is screaming for our products, and we need to find a way to meet their demands." Their solution was to come in at 1:00 p.m. on Sunday afternoon and work until midnight so they could go to church in the morning.

I quite honestly doubt that industry today is dominating the workers. South Carolina is a nonunion state; there is no doubt about it. The labor rates in South Carolina are almost as high as they are in the North and Midwest, and unemployment in South Carolina is a third of what it is in Ohio. We have to measure what is good for the people.

Question: You speak of the importance of trust in organizations, and yet I sense that you do not much trust educators, based on what you have been saying. How do you think we could improve the trust relationship between education and industry?

Actually, I have a great deal of trust in you. But "a great deal" is relative. Most industrialists think that educators look down on us. We have an inferiority complex. Because you so seldom ask for my help, I sometimes suspect that you think I have nothing to offer. I have a great deal of respect for educators, provided they can come down and mix with us, but many of them cannot. Communication is difficult.

I have a great deal of difficulty with many of the school principals I meet. They have lost the desire to teach and, unfortunately, when I go into a school to give a talk, my impression of the school is based on the one or two people I meet. I never get to meet the teacher who is working at 9 p.m. running a drama group or other extracurricular activities. In the academic business, no motivation exists to do a better job other than for personal ego. Educators are in a business that automatically gives them an increase every year, whether they earn it or not. Some teachers have tenure, so they can't be terminated.

Another problem that gets in the way of good communications between industry and education is that no forum exists where you and I can meet. America is polarized. We talk about England being a status-conscious country, but I think America, in many ways, is more so. So industrialists in America simply don't easily meet teachers. We need to find new forums where you and I can meet.

Question: I am beginning to wonder if you think vocational education is really important. The kinds of skills you are telling us you need are really more in the domain of general education, especially if you include a mixture of family values. So I wonder how you think the vocational schools fit into the scheme of secondary education, and even what the postsecondary schools should be teaching? If you take a checker from a supermarket and give her half a million dollars worth of equipment to run, and she understands it and can tell you what's wrong with it, then I wonder what the purpose of vocational education is?

That is an interesting question. It is absolutely true that we can take almost anybody and train her or him to do certain things. But certainly I am not implying that such people maintain that piece of equipment or program it. We can train them to operate it, that is true.

In answer to the question, I should tell you that I have a problem in many ways with the name "vocational school." I do not understand or agree with the idea that there needs to be two separate tracks within one school system. Vocational education is the stepchild of the public

school system. In my county alone we have built six separate vocational schools, all of which are a significant drive from the regular school. The children spend the same time at each, but every day they miss out on school time that must be spent on driving time. This makes no sense to me.

A statement was made by a learned man just before I came here, who said that a vocational school is a school to which you send your neighbors' children. Vocational subjects all have a great deal of merit. Public education must understand that the majority of students do not need to go to college. We are fooling ourselves by putting money into trying to educate students over and above what they have the potential to do. We need to realize that if all a person ever can be is a dishwasher and we train that person to be a good dishwasher, then we are good teachers. If a man or a woman has the potential to be president of a bank and does not get there, then we have failed.

What is the role of the teacher? The role of the teacher is to get the most out of students and to provide an environment for positive growth and development. We do need programs that will teach those people who are unable or not willing to go to college how to earn a living and be self-sufficient. That is a basic need.

My training manager can give you a list of other skills that new workers ought to be taught, depending on the technical level of their jobs. I do not want to eliminate vocational courses, but I do have some questions about the things that you do in your programs. I went to a vocational school recently and observed students working on cars. They did nice work, as I am sure most vocational students do. My question to the instructor was, "Why are you training people on ten-year-old cars?" When they graduate, those students will be working on cars that have on-board computers. Yet, the vocational instructors are teaching them to fix 1957 Chevrolets, and when those students graduate from school, the jobs that industry will want them to do will involve fixing a 1982 Pontiac. Where is the relevancy?

Question: What type of training program do you feel is most effective (for example, small group versus large group, individualized competency-based, print-based, hands-on)? Which work best?

I am a great believer in hands-on training. I am a great believer in learning on my feet, with personalized instruction. I am a great believer in education that you can relate to, and in which you can see the reason for doing the work. I am a great believer in education that "opens the door" for people.

One of the great things that we in industry have to do is take the people we currently employ and challenge them to do more by reeducating them. We have millions of people—millions of minorities, millions of women—who have been artificially held down through the years and not offered the opportunity for training. I can cite dozens of examples where a company has put a young college graduate into a midlevel job and the boss says, "Now, I am going to give you to Mary, who is our secretary, because she really knows how to run the whole plant. She will teach you and then next week you will be her boss." Industry needs to change that; we need to retrain and promote Mary.

The Japanese concept of hands-on training is very, very successful. The Japanese technique of less peer competition in the earlier formative years is also very successful. We believe, at Lucas, in having small classes, course material you can relate to, and instructors with personalities that let you feel comfortable about coming back and asking questions. We believe that practice makes perfect—always presume that the students did not get it and then go back

and review it again. We spend a great deal of time teaching the principle that you can learn if you want to.

Teaching ten people on one machine at the same time is difficult. I will teach each one personally, but I have to do it in a way so that the individual can feel safe in him or herself. Another problem with teaching bigger groups is that you automatically belittle people in a big group, even though you try not to. If I teach twelve people, and only one is a woman, I teach for the men. I have to teach for the men. If the woman does not quite understand, a lot of social pressure is on her not to ask a question, so she loses. Then I lose. The smaller the group, the better.

Question: You mentioned the need for interpersonal skills training for people who work in companies that use the new participative management styles. What other skills do you think workers need that vocational education could be preparing them to acquire to help them work in the new quality-of-work-life arena?

Interpersonal skills are a big need. One particular problem in our plant in South Carolina is the fact that we employ people there from six countries and from all over America. We have had all the problems of male/female or black/white differences that in many schools are a worry. But when it comes to us, it is a *problem*. Most of our employees have never been exposed to a democratic workplace or participative management. They have never had to deal with a black woman supervising a white Englishman. That's a combination they did not teach in England.

We talk about interpersonal skills, but how do we get along with different people? What interpersonal skills does a twenty-one-year-old person whom we have put through two or three years of training need to supervise a man who is over forty? It is a necessary ability, especially if the twenty-one-year-old technician who has to handle that older man is a woman. So, when I talk about interpersonal skills, I do not mean just handling people but also communicating with them and with their fellow workers.

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