Training Middle Level Technical Manpower for Today and Future Industries

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Introduction

The industries in the United States are largely dependent on the skills of the middle level technical manpower for machine maintenance, operations and other support services. With the growing world economy and its global competitive nature, our industries are witnessing the transition into high-skilled and information-based industries. This transition has created a wide gap in the needed skills of our middle level technical manpower, which is required to keep the industries in the global competition.

In industries, the people who occupy the middle level technical manpower comprise of those that are actively involved in using technical skills and hands-on activities to manufacture products, including support services and supervision. They range from the front-line managers and engineers, first-line supervisors and down to the technicians and operators on the plant floor. These groups of people are now facing unprecedented challenges in their efforts and activities to make things happen on daily basis towards the manufacture of products and support services. One aspect of their challenges is the provision and acquisition of the skills, training and education needed for the execution of their daily duties.

If Americans are to maintain their quality of life and strong economy, they must regain the last century advantage created by a superior work force. American business and industry need highly skilled workforce in order to compete in a global economy. Numerous reports chronicle the failures of our leadership, educational system, industry practices and the decline in the skills of American workers. To continue as a world leader, America must close the gap

between the skills that Americans possess and those required for productive employment. Global competition is transforming the economic landscape. Fierce competitors from abroad have entered domestic markets, and one great American industry after another has felt the effects. We have watched with growing concerns as a great national strength has been challenged. (McCabe, R. p.17) [1]

The Problem with Today's Middle Level Technical Manpower

The American middle level technical manpower has grown old and it is very much in need of being rejuvenated. Today the average ages of the middle level technical workers in our manufacturing industries are above 40 years. Brian Baskin, (2007) writes that as aging generation of workers retires, industry experts say the resulting shortfall in skilled labor could lead to an increase in delays and problems on mega oil and gas projects. According to Baskin, Jack Hartung manager of benchmarking and cost engineering at Chevron Corporation (CVX) stated that the median age at oil companies is between 48 and 52. [2]

The ageing problem is not peculiar to the oil and gas industries alone. Sam McClure, the Supervisor of Machining and Maintenance at John Deere Engine Works in Waterloo, Iowa, stated that the average age of the maintenance personnel in his plant is more than 50 years and most of them would be eligible to retire in about 10 years (see Figures 1 & 2). McClure predicts a very difficult future for the manufacturing industries in the United States if adequate measures are not taken to control the situation by training younger people to replace the retiring workforce. A maintenance supervisor for a reputable manufacturing plant in southeast Kansas, who spoke to me on condition of anonymity, said that average age of the maintenance workforce in his plant is 47 years and 41% of them are over 50 years old, with more than 30 years of service. In Mexico for example, the situation is different. According to Gabriel Gardea, the Group Manager Maintenance & Plant Engineering at John Deere plant in Torreon, the average age of the hourly workforce is 22 years and that of the salary workforce is 33 years. This prevailing ageing condition of the middle level manpower puts the future our manufacturing industries in the United States in a difficult situation.

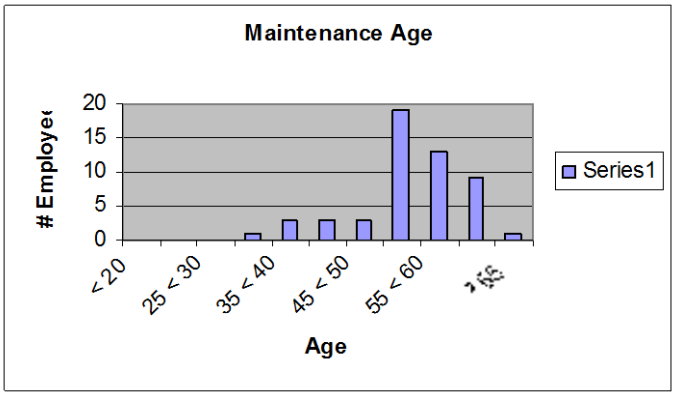

Figure 1: Average age of Maintenance Employees

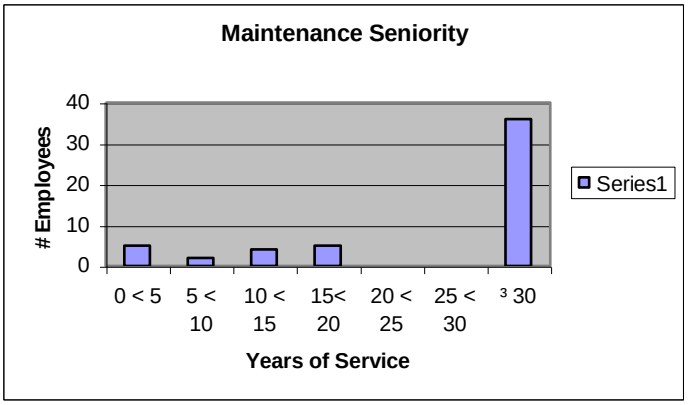

Figure 2: Maintenance Employees Years of Service

The Need for Middle Level Technical Manpower Training

About 90 percent of the fastest-growing jobs of the future will require some postsecondary education or training (U.S. Department of Labor). Therefore the need for training middle level technical manpower cannot be over emphasized since it affects all manufacturing industries in the United States. Dick Marler, president and CEO of Signal International, said the

company would likely need guest workers until the Mississippi Gulf Coast returns to normal. As a result Signal International, an oilrig construction and repair company with yards in Mississippi and Texas, has begun receiving 290 temporary guest workers from India to fill first class welder and fitter positions at its Pascagoula shipyard. More than 200 workers have arrived, according to company officials, with the remainder to come later. (Nelson, K., 2007) [3]

Trained middle level technical professionals have become scarce commodities in the United States. They are not available in the labor market for immediate employment. The project manager for Interstate Electric, an electrical construction company in southeast Kansas once told me that his company's employment advertisement for electricians has been running in many area newspapers for more than one year without the needed response from qualified candidates. Many electrical contractors in southeast Kansas have turned down new constructions and continuous improvement projects in manufacturing plants because they do not have the manpower. This shortage of middle level technical manpower is the resultant effect of the gap in training for excellence in our technical and community colleges, including the universities for the future of our industries.

The early Middle Level Technical Manpower Training

Historically, community colleges were established in the United States to develop middle level workforce. The goal was to serve the needs of the local community, mainly in technical professions and for other students who could not afford the cost of living in the campus or off campus housing while attending a four-year college. In the later years, most of the community colleges established course-transfer arrangements with four-year colleges, which enable students after completing their associate degrees to continue their studies towards a bachelor's degree. There were also early involvements of some community colleges with local industries, which contributed immensely to their successes. For example, Johnson County Community College in Overland Park Kansas was established in 1969 and by 1986, Burlington National Railroad Corporation, which is one of the nation's biggest railroad companies, went into partnership with the college for middle level technical manpower development and training. In addition to the railroad technical training courses, other courses in the college's technology center include electrical technology, electronics, CAD and pre-engineering. There were also academic courses in fields such as social science and humanities, health services, applied sciences, English and

mathematics for students who plan to further their education in a four-year university. This partnership not only helped the college and industry, it also helped to train skilled technical manpower for other area industries.

There were many other community colleges known to have similar partnership arrangements with companies in their local communities. Table 1 below illustrates how some colleges partnered with their local businesses.

Table 1: Community Colleges and their Corporate Partners

Community College	**City/County & State**	**Corporate Partner**
Central Piedmont Community College	Charlotte, North Carolina	Okuma America
Cuyahoga Community College	Cleveland, Ohio	Ford Motor Company
Delta Community College	Bay County, Michigan	General Motors Corporation
Lane Community College	Lane County, Oregon	Symantec Corporation
Monroe Community College	Rochester, New York	Kodak Company
Moraine Valley Community College	Chicago, Illinois	AutoDesk Inc
South Seattle Community College	Seattle, Washington	Boeing Company
Sinclair Community College	Dayton, Ohio	Reynolds Company
St Louis Community College	St. Louis, Missouri	McDonnell Douglas Corporation

On the other hand, the four-year colleges were not left out in the training of the middle level manpower for the industries. Many four-year colleges were established as "Manual Training Normal Schools" for teacher and vocational-technical training. The schools provided middle level manpower to area industries. It used to be a routine for companies to allow their employees to rise through the ranks and to positions of first-line engineers and supervisors, without formal educational preparation. Today many industries have learnt that a four-year college degree is highly desired of a candidate for the position of first line manager, engineer and supervisor. In support of these industries, many four-year colleges have introduced programs leading to Bachelor's and Master's Degrees in fields such as Industrial Management, Industrial Technology, Operations Management, Organizational Management, Engineering management, etc. These are efforts to train the middle level manpower for tomorrow's industries.

The Role Changing Effects of Our Training Institutions

The goal of every institution of learning is to transform students to become useful and acceptable members of the society. In the early years, colleges and universities were ranked according to their academic excellence. Today it is different and if an average person in the street is asked to name the best schools in the United States, the expected response would be college rankings based on sports excellence. The Colleges and Universities in the United States have channeled most of their resources towards the training of athletes and emphasis in academics has so much been relegated to the background. A good number of students are recruited into the colleges and universities for the purpose of playing in one or more sport activities. These students generate very high dollar amounts in revenues for the institutions. They also keep their hopes high in anticipation of signing multi-million dollar professional contracts before or after graduation. Most of these student athletes who do not go into professional sports end up not graduating with degrees and some of them who graduate, end up in fields that will not earn them jobs in our present society.

The NCAA's annual graduation report, which is based on a U.S. Department of Education formula shows that 62 percent of all Division I athletes entering college in 1998-99 earned their degree within six years, compared with 60 percent of all students. The numbers, which equal the previous record high, come from data collected for 616,067 students at 320 colleges, including 17,176 athletes. Fifty-five percent of male athletes graduated within six years, compared with 57 percent of male students. According to the report, men's basketball had the lowest graduation rate of any sport in the survey, which also included men's baseball, football, track and field, as well as women's basketball and track. Only 43 percent of men's basketball players finish their degrees within six years. (Wolverton, B. 2006) [4]

Professional careers in fields such as health services, arts, engineering, science and technology have become less attractive to young people who look at the entertainment industries as the quickest way to achieve wealth and celebrity status. The professional athletes and coaches have become celebrities and role models for the youths. As a result, a lot of families do not care about their children's academic performance in the classroom but they will frown and sometimes get into fights with coaches who they think are not fielding or coaching their children well in their chosen or preferred sports. Parents spend enormous amount of money to equip their young

and teenage children with all necessary sports attire and equipment, in preparation for their professional career in sports but will oppose any little contribution, financial or otherwise towards academic excellence. The Associated Press, (2007) reported that an angry soccer mom dropped off her teenage daughter alongside an interstate because she was miffed about her daughter's poor play in a soccer game. [5] That shows the extent to which some parents can go to force their children into sports as opposed to careers in industrial or technical fields.

The role changing effects of our training institutions is not only at the students' level. The faculty level is also challenged. The football and basketball coaches, most of them, if not all without Ph.D.'s, have become the highest paid "faculty" members in our colleges and universities. According to Descygna, (2010) as of 2009, the five highest paid college football coaches, with their yearly salaries, are: Bob Stoops, University of Oklahoma $4,303,000; Urban Meyer, University of Florida $4,000,000; Nick Saban, University of Alabama $3,900,000; Les Miles, Louisiana State University $3,751,000; Jim Tressel, Ohio State University $3,722,000. [6]

Entertainment is dominating the academic activities in our high institutions of learning. Millions of dollars are spent on building new stadiums and other sports arenas while old ones are being renovated, whereas laboratories and equipment for engineering and vocational-technical training are not receiving enough of the needed dollar amount and attention. Andrews, A. (2006 Black Voices – Athletics vs. Academics) wrote that the preferential treatment doesn't stop with stadium equipment; it also trickles down to the athletes themselves. Andrews stated that special attention towards athletes can make normal students feel overlooked by their university. Andrews cited an example with the University of Southern California where students who walk out of Heritage Hall must pass by the cafeteria built especially for athletes, which looks like Tavern on the Green compared to the mess hall where the university makes the non-athletes or common people eat. [7]

Training Middle Level Technical Manpower for Tomorrow's Industries

Training involves the acquisition of skills or learning concepts to increase performance. According to Evans & Lindsay, (1993) a number of recent studies have shown that businesses in the United States do not spend enough time and effort on training compared to similar organizations in other countries, such as Japan. [8] Therefore in order to be successful, manufacturing industries must totally embark on training the middle level workforce to improve

the employees' skills, which will reduce total maintenance costs, reduce equipment downtime and increase product output. The following are few suggestions for training middle level technical manpower for tomorrow's industry.

***Good Leadership*:** The leaderships in many industries have failed in their efforts to stay in business and be profitable. There is the general notion among many middle level employees that "they don't care", referring to their leadership. The fact is that people don't care if they do not understand. In many industries, putting a "square peg in a round hole" is a very common practice. Putting someone in a position that he/she is not qualified has ruined many organizations. For example, during my years at Delphi Olathe, Kansas, a shipping supervisor with a college degree in social science and zero years of maintenance experience was promoted to engineering manager and later to maintenance general supervisor. This kind of leadership position should never be given to someone who cannot assist maintenance personnel in problem-solving exercise or able to determine training needs to close the gaps in personnel skills and experiences.

College and Industry Partnerships: For many decades, America's community colleges have been known to provide both academic-transfer credits for students transferring to four year colleges and vocational-technical skills for the industries. What has gone wrong today? The answer is simple. We have broken away from our basic culture of partnership between the colleges and industries. The industries must re-introduce partnerships with the two and four-year institutions to establish the types of vocational-technical training that will enhance the skills needed for the present and tomorrow's industries. For example, Halliburton recently announced the official opening of a new training center in Tyumen, Russia, in cooperation with Tyumen State Oil and Gas University. The training center is designed to further develop the professional and technical skills of the company's employees in the Europe Eurasia Region. [9] Today in the United States, the trends in most industries have become to outsource the middle level jobs because of the shortage of skilled labor to support the industries.

Government Involvement: The changes in technology systems have become very rapid that it would require likewise steps to keep up with the changes. Today the cost of training in our colleges and universities is very high that it will require assistance and full involvement from our governments. For example, in 2007, the United States Secretary of Labor Elaine L. Chao announced series of investments totaling more than $105 million to address the workforce needs

of the advanced manufacturing industry. These investments result from forums, which the U.S. Department of Labor hosted over the past three years with industry leaders, educators and the public workforce system to identify the industry's hiring, training, and retention challenges. (U.S. Division of Labor) [10] In the state of Massachusetts, Governor Deval Patrick plans to unveil a proposal to make Massachusetts' community colleges, among the priciest in the nation, free to all high school graduates in the state by the year 2015. State educators and governor's aides, who spoke on condition of anonymity, said the community colleges are key to galvanizing the state's economy, by educating struggling workers and students to fill empty jobs. At least 20,000 unfilled jobs in the state require a two-year degree, according to the plan. (Sacchetti, M., 2007) [11]

Conclusion

Enough cannot be said about the shortage of middle level technical manpower in our manufacturing industries in the United States. The future of manufacturing in our country depends on how urgent we are able to change our present culture and do the right things that will add value to our system. Individuals capable of evaluating industries' training needs and making right decisions on how to bridge the gaps should occupy leadership positions in the industries. The colleges and universities must put a lot of emphasis on academics, including mathematics, science and technology and not in sports as it is done presently in most colleges and universities. The businesses and industries must have to work together with our two and four-year training institutions to re-establish partnerships in manpower training and development. States and federal governments should also be fully involved by providing funds and other aids to students in technical and vocational schools.

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